Handbook of Distance Education

FOURTH EDITION

EDITED BY
Michael Grahame Moore
and William C. Diehl

ROUTLEDGE

HANDBOOK OF DISTANCE EDUCATION

The *Handbook of Distance Education, 4th Edition* is a comprehensive compendium of research in the field of distance education. Chapters framed in terms of empirical research explore how technology can facilitate more effective teaching and learning experiences, and the book's inclusion of specific digital tools is thoroughly current. The volume is divided into four sections covering the historical and theoretical foundations of distance education, attributes of teaching and learning using technology, management and administration, and different audiences and providers. Throughout, leading scholars address future research needs and directions based on current research, established practices, and recent changes to implementation, pedagogy, and policy across contexts.

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PREFACE

This newly revised edition of the Handbook, like its predecessors, is about research and other scholarship in distance education. The book follows a similar thematic structure to previous editions, with the exception being the combining of the section dealing with teaching and the one dealing with learning. Thus the book is presented in four Parts, as follows:

Part 1 Historical and Theoretical Foundations
Part 2 Teaching and Learning
Part 3 Management, Policy, and Administration
Part 4 Audiences and Providers

This structure is only slightly modified from that of previous editions, and its purpose remains the same—to provide access to a broad selection of the scholarly and research literature, organized in a way that will enable students and practitioners to identify sources relevant to their particular needs, as the first step leading to their personal, in-depth, follow-up literature research. It was the perceived need for such a compilation that led to the publication of the first edition of the Handbook in 2003, at a time when it had become apparent that distance education had already emerged to be one of the most significant developments in education of the previous quarter century.

The need for a new and updated edition is no less acute, six years from the last edition, as distance education continues to make inroads into the mainstream of educational and training practice at all levels, and in virtually every field of learning. Across this wide educational spectrum, it remains the subject of close attention by policy makers and administrators as well as teachers and students. Its traditional role of opening opportunities for learners and its more recent role of adding to the quality of teaching are roles now widely recognized, as much by professors in universities and community colleges as by trainers in corporations and the armed forces, in continuing professional education of teachers, physicians and nurses, public accountants and pharmacists, leaders of voluntary organizations, managers in the corporate boardroom and workers seeking new skills on the factory floor. What I described in the first edition as the "recent frenzy" of precipitant innovation driven by excitement about Internet technology, has subsided to a considerable extent, as those who got caught up in that early excitement have discovered for themselves the challenges as well as the benefits offered by the technology. Online communication has long ceased to be an innovation for most teachers,

as they have settled down to confront the more interesting work involved in acquiring the skills needed for designing and delivering quality programs and understanding their students beyond the classroom. Less cautiously than before, an increasing number of the leaders of their institutions have also faced the challenge of developing the different management and administrative changes needed to accomplish good quality distance teaching. Most difficult among these are changing the allocation of resources required to produce mediated programs with quality, and the particularly difficult job of channeling their faculty into roles more appropriate for the information age than those they have been accustomed to performing in the classroom. Even so, in this regard, timidity still overshadows boldness and considerable more education of the leaders is called for. Of course it is the students who are learning new ways and set the pace for both their teachers and administrators—a generation having grown up to be at ease with social networking and mobile technologies, accustomed to learning informally out-of-school, and inducted from an early age into the satisfaction of independent learning online.

In this environment of further maturing in understanding about distance education, as it becomes increasingly part of the educational mainstream, accompanied by continuing volatility in the invention and spread of information and communication technologies, a growing number of graduate students in Colleges of Education, among others, are looking for the opportunity of academic study of this field, and a growing number of educational institutions offer programs of study, particularly at graduate level. As it becomes increasingly part of the educational mainstream, the environment of maturing the understanding about distance education further, as it becomes increasingly part of the educational mainstream. It is accompanied by continuing volatility in the invention and spread of information and communication technologies. Evidence of this can be seen in the growth of the number of doctoral dissertations that include the terms 'distance education' or 'distance learning' in their title. At the most modest estimate, the average is about 100 dissertations each year since the beginning of the decade.

As editor for more than 30 years of *The American Journal of Distance Education* I am aware of the enormous increase in interest by university and other faculty in publishing research in this area, resulting in an overwhelming supply of article submissions. I also note the growth in the number of new journals, especially online journals that are able to absorb what the more established journals cannot publish. The extent of this growth in scholarship of distance education becomes more apparent when we take into account the many research studies and published works that focus on one or other of the component parts of this field, or one of its many applications—reported in terms such as distributed learning, tele-learning, e-learning, open learning, blended learning and flexi-learning. Each of these subsets of distance education has generated its own following of specialists, some with their own journals, conferences and an evolving corpus of literature—a natural development in this, as in any, maturing field.

This splitting of the field into component specialties does, however, bring with it one problem. By focusing on what is published using the terminology of one part of the field, students can be distracted from the relevant knowledge that is packaged under the label of one of the other field's component parts. In this Handbook, it is intended in Part 1 to provide the reader with a preliminary understanding of the broad dimensions of the field through a reading of its history and foundation theories offering, we hope, some conceptual tools that will enable recognition of both the specific trees in this forest, as well as the woods of which they are a part. Here, just to underscore how critically important it is to recognize how broad the field is before tackling any of its components, I will repeat the definition of distance education: "teaching and planned learning in which the teaching normally occurs in a different place from learning, requiring communication through technologies, as well as special institutional organization" (Moore & Kearsley, 2012, p. 2).

There are three key words here that are worth emphasizing. The first is "normally," which should remind us of that in distance education the use of communications technology is *not* an option but is a defining characteristic of the teaching-learning relationship, unlike its use in the classroom where the

same technology is ancillary to the teacher's presence and thus the control of the curriculum and dialogue with students by that presence. The second word to highlight is "planned" as in "planned learning." In this age of ever-ready search engines, and global exchanges of information through social networks, we need to remember that our study is of *education,* and education is always a two-sided transaction—learners on one side and a teaching agency on the other, having the resources to make learning more effective and efficient than when it is entirely self-directed. That is not to detract from the importance of self-directed, informal, independent learning, but it is important to avoid the muddled thinking that we sometimes encounter in the social media in which informal, even serendipitous, learning is spoken of as synonymous, even sometimes replacing, education. The last word I would like to note is the word "organization." It reminds us that our field includes as well as study of information and communications technologies and questions regarding the design of teaching programs and facilitation of learning, includes study of the administrative, organizational, and policy issues associated with the provision of such educational programs. Broad too are the research methods that should be brought to bear on those questions, employing techniques from all research traditions—experimental, case study and ethnographic, comparative and historical. The aim of such activity is the acquisition of empirically based knowledge, organized in a body of literature, and sometimes synthesized into a theory that will act, in turn, to point the way to further empirical research.

It is the four broad topical areas of study and research listed in the opening paragraph that provide the themes around which this *Handbook* is organized. Following Part 1, that introduces the history of the field and some of its widely recognized theoretical foundations, such core ideas as "systems approach" and "independent learning," subsequent Parts provide reviews of learning, course design and teaching; policies, administration, and management; and the main client groups and institutional providers.

These chapters are, in almost all cases, updated versions of chapters dealing with the same topics in earlier editions, in many cases revised by their previous authors but in many other cases with newly commissioned authors who have updated the earlier versions. Several new topics have been introduced, such as chapters dealing with MOOCS, a chapter on Latin America, gender and feminism, and only one chapter (Chapter 1) has been reproduced from the last edition.

Rationale for the *Handbook* and How to Use It

The motivation for producing the Handbooks of Distance Education has two roots. First, as the editor of *The American Journal of Distance Education* for more than a quarter century, and as adviser of doctoral students during that same period, I have noted that one of the most common causes of difficulty and of failure for researchers as well as students is a too-common view that research is nothing more than mere empiricism. From this perspective, the focus, indeed the beginning and end of the research process, is gathering, analyzing and reporting data. I might almost say "grabbing at data." The "literature review" that typically is the second chapter in a doctoral dissertation, or comprises the opening section of a research article, is often approached as a tedious chore imposed by convention that has to be got through as quickly as possible before getting to the "real thing"—which is to gather and report data. These data may be the results of a survey or a case study, or—too seldom—an experiment. However much of this data gathered and submitted for publication, and even reported in some dissertation studies, has little to no value! This is simply because the research question that the data is supposed to address has little or no connection with the previous state of knowledge, as reported in the literature. I have found it sad for many years to see students (and others who should know better) investing time and energy to design a study and collect data that addresses questions that have already been answered, or that are unanswerable, given the present state

of knowledge. Not quite so seriously, I see other studies based on a review of a too-narrow set of literature that falls short of their potential by not linking to a wider literature, in other words, a more general theoretical framework. A common example is the research question that addresses teaching and learning through a specific technology, grounded in a review of the research of that technology, but missing a wealth of relevant knowledge on the same question that was conducted in programs using a different technology.

In writing this comment in 2018, I am repeating a view expressed in the last edition of this book, and yet it has to be repeated if only because *the situation has deteriorated compared to five or ten years past*. The very ubiquity of online teaching today has the unwelcome effect of more and more people teaching and researching the online teaching processes with little—it must be said in most cases NO—knowledge of the history, theory, and research about distance learning and teaching. The shallowness of so many literature reviews submitted for publication is quite depressing. Perhaps just as disheartening is the reality that there are now many online journals that provide an outlet to this research, with the effect of multiplying the extent of theory-less research and the effect of a downward spiral in the quality of what is researched and published.

Our sympathy should lie with the student, confronted by what must seem an impossibly confused and anarchic body of literature, with hundreds of journals with titles suggesting possible relevance to the distance education study. What help can be provided? In our view the best help is to address the problem as already stated—that research will likely succeed when it is based on a good foundation of knowledge of previous research. It is therefore to meet this need, to provide a structured guide to what is *already known* about distance education, and thus help better-grounded research, that the Handbooks have been written.

The second root motivation for this collection is closely related to the first. Experience as a consultant to a wide range of institutions, states, national governments and international agencies over several decades has led to the conclusion that a similar impatience for moving to action without adequate comprehension of previous experience characterizes not only the research, but virtually all practice in this field. Just as it is hard to imagine that in any other field of inquiry researchers could set out to gather data without knowing what research had been previously undertaken, it is hard to imagine that other professions would set up departments, design courses, recruit teachers, invest millions of dollars, make appearances before congressional committees, and so on, without first acquiring a substantial knowledge of previous practice in their field, without having a thorough knowledge of what had succeeded and what had failed, and the reasons for those successes and failures. Yet in distance education, it happens all the time. University professors generally knowledgeable in an academic subject, and skilled in lecturing to rows of students in a classroom, are driven into designing courses for delivery on the Web or by video-conference with little or no knowledge about how to design programs suitable for learning. In what is still a more individual mode of study, requiring the special skills of facilitating interaction with content, learners, and instructors through information and communication technologies. The same could be said about teachers in K-12 schools, trainers in business, and other corporate settings.

Thus, this book is intended to be a source of information for students and researchers to help them *know what is known* before they begin a search for new knowledge, and to help practitioners and policy-makers *know what is known* before they plan, design and deliver new programs. It should be emphasized, especially to the researcher that this is *only* a key. No synthesis or summary of other people's research can be a substitute for the knowledge provided by that research itself, and so each of these chapters should be regarded as merely pointing the way to the literature that has to be studied in depth. Our approach in

compiling this book, showing also the way we expect the book to be used, can be explained by quoting the following instruction, given our authors when their contributions were commissioned:

> "To provide the reader, particular the student, with a reference source for study and research in the author's specific field, and therefore takes the form of a comprehensive, thematically structured review of the research and other literature published up to and including 2017. The chapter is not a report on the author's particular research or opinion except as is reasonable to include as part of such a comprehensive literature review. One way of conceiving the chapter is as a bibliographic essay."

I should say immediately that as in other editions, some authors strayed from the narrow path laid out for them and there are, in a few chapters, what can only be described as authors' opinions, some of which are quite polemical; where they survived the editorial review it was for their merits in offering issues for discussion as well as, I hope, provoking research. It should also be explained that for the new edition, that authors were expected to carry over many of the references from earlier editions because they represent what is known and needs to be known, but add literature of the past five years, so that this edition can entirely replace the earlier ones. To accommodate the additional content, the length of each chapter was increased by one-third, and to compensate for this, compared to previous editions, the number of chapters was reduced.

Our recommendation to students is that early in your studies, you should skim the whole book, and subsequently, after deciding on an area for research, take the relevant chapters as the starting point for identifying the literature in that area. The next step is to locate each of the items listed in the references of the chosen chapters and, using them, dig deeper and deeper into the literature until mastery is achieved. Lest that seems too easy, it has to be repeated that knowledge in this field, like most others, does not lend itself to water-tight compartmentalization and it is *vital* to be aware that something of value for any research question can be found within a chapter having a principal focus that is quite different from the question one is focused on. In this book, for example, we have chapters about historical research in Part 1, but references to history will be found in several chapters in other parts of the book. Similarly, it is impossible to separate important references to learning from those of teaching, while much that is addressed to administration is relevant to both. The process of literature research is not easy, but there can be no doubt that time and effort spent in this foundation work will result in better research and better practice.

In this *Handbook*, as in previous editions, we have assembled some of the most respected authorities in the North American field of distance education as well as some "rising stars." In extending our invitations we aimed to deal with another problem commonly encountered in advising students and in reviewing research. This is the problem of *authority*. Along with my plea to give more attention to building a solid theoretical foundation for their research and practice (i.e. "knowing what is known"), I would like to remind students (and other readers) of the importance of developing a critical perspective on what is published, recognizing that not all that is published is of equal value. In this age of Facebook, Twitter, blogging and so-called open source materials (as is now widely acknowledged), it is a bigger problem than ever before to identify what is trustworthy, and the search engines that make it easy to gather whatever is published on the Web give no reliable clues about its quality. Before one can use literature effectively, it is necessary to learn who are the most trustworthy authors, and which publications are most trustworthy — that have greater authority.

In this book the reader can be assured that the authors have considerable authority. At a minimum, almost everyone has published research in *The American Journal of Distance Education*, itself the result of vigorous competition and a rigorous review process. In this fourth edition most contributors are returning veterans of one or both previous editions, and some have shared the task with their

protégés. Such true authorities are in great demand in a field that is insatiable in its demand for real expertise, and consequently I have to express deep appreciation to them for volunteering their time to make their contributions to this book. Additionally, I wish to express my special thanks to my co-editor Dr. William Diehl and to his graduate assistants Leslie Cano and Kate Antanovich, and finally, once again I thank the staff at Routledge, our publisher, particularly Alex Masulis for their continued encouragement and support.

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PART 1

Historical and Theoretical Foundations

An Overview

William C. Diehl

As Michael Grahame Moore notes in the Preface of this handbook, the maturation and mainstreaming of the field has not only led to a growth of scholarship, but also to a fragmenting of areas of focus. Hype cycle after hype cycle, the field has been and will inevitably be swept forward by new technologies, and distance educators will need to react accordingly—as it has been from correspondence education via the postal service, to radio, to the telephone, to television, to satellites, to the Internet and World Wide Web, to mobile phones, and to virtual and augmented reality. The first section of this handbook is important because it provides historical and theoretical context for the contemporary work of students, scholars, and practitioners. It has been said many times, but having historical perspective is valuable, and looking back can often be as enlightening and enjoyable as looking forward to the next shiny object.

In Chapter 1, Linda M. Black introduces early research in the field and covers the evolution of early organizations that facilitated collaboration and research within the field. These early professional associations provided platforms for the first lectures, seminars, symposia, workshops, and conferences, and for the sharing of research findings and related publications that followed.

Chapter 2 focuses on several individuals who played a pivotal role in the development of research, theory development, and scholarship. William C. Diehl and Leslie Cano provide an overview of the innovation and leadership of Charles Wedemeyer, and of his collaborations with distance education theorists Börje Holmberg, Otto Peters, and Michael Grahame Moore. This chapter also provides an overview of the theories and scholarship of each of these pioneers, and it provides breadcrumbs that will lead to their original and foundational work. Prior to Wedemeyer's work, as you will learn in Black's chapter, most scholarship consisted of surveys and descriptions of the field. Moore dives deep into his theory of transactional distance in Chapter 3, and in doing so, includes the origins of the definition of distance education and even the state of the field in the 1970s and 1980s. Moore also provides insights into today's popular topics (e.g., personalized learning, competency-based education, and artificial intelligence) as related to transactional distance. The reader will also find a review of the past six years of transactional distance-related doctoral dissertations. A natural transition from Moore's chapter is Jon Dron's Chapter 4 on independent learning, in which he covers this concept's foundations along with the tensions that exist between dependence and independence in intentional learning. In the process, Dron relates the evolution of university teaching to these ideas, including pedagogical generations, and last, an overview and analysis of MOOCs as related to these ideas of dependence and independence. Building upon ideas covered in the first several chapters of the

handbook, Martha Cleveland-Innes, Norman Vaughan, and D. Randy Garrison, present in Chapter 5 the foundations of the core and then an in-depth look at the Community of Inquiry (CoI) theoretical model. Readers will benefit from the analysis and description of social presence, cognitive presence, and teaching presence—and will find value in learning about the theoretical and practical implications of the CoI theoretical framework.

Edith Gnanadass and Amelia Y. Sanders, in Chapter 6, provide an historical overview of the role and relationship of women and the importance of paying attention to issues of gender in the field of distance education. Along with this background, they provide a contemporary review of gender and technology, gender and social presence, and communication (interaction). As we strive for equality in society, this chapter will remind readers that there is still much to be accomplished—and it will provide insights into how we can move forward. Finally, the first section closes with Chapter 7's systematic review of research on distance education, online learning, and blended learning. Robert Bernard, Eugene Borokhovski, and Rana M. Tamim round out the foundations section with a chapter that sheds light on the past decade and a half of research in the field.

While all of these chapters offer value as stand-alone offerings, readers will gain even greater understanding from the ensemble in Part 1.

1
A HISTORY OF SCHOLARSHIP

Linda M. Black

This chapter reviews the history of the scholarship of distance education and is organized in seven parts. They are: (a) the pioneer researchers; (b) research centers; (c) trends in the late 20th century; (d) professional development of distance educators; (e) professional associations; (f) lectures, seminars, symposia, workshops, and conferences; and (g) publications and other media.

Pioneer Research

Among the first people to undertake research in distance education was John S. Noffsinger, secretary of what became the National Home Studies Council, who, in 1926 recorded the first systematic description of American correspondence study (Moore, 1987a). Other early advocates for research were Gayle B. Childs of Kansas State University (Almeda, 1988) and Charles A. Wedemeyer of the University of Wisconsin-Madison (Moore, 1987b).

After he wrote his doctoral dissertation about correspondence education in public schools, Childs (1949) received a grant from the Ford Foundation (Wright, 1991, p. 43) to undertake one of the first studies of educational television. Urging the National University Extension Association (NUEA) to support more such research, Childs (1966) himself participated in a milestone study of correspondence education completion rates. The study gathered data on 42,068 college enrollments in 32 institutions and on 17,520 high school enrollments in 24 institutions.

During the 1960s, the Correspondence Study Division (CSD) of the NUEA and the National Home Study Council (NHSC) collaborated in the Correspondence Education Research Project (CERP), a national survey of correspondence study in higher education in the United States. CERP was the first study to report evidence that distance education in the form of correspondence instruction could be as effective as face-to-face classroom instruction (MacKenzie, Christensen, & Rigby, 1968, pp. 104–105).

Charles Wedemeyer, as director of correspondence study at the University of Wisconsin-Madison during the 1960s, conceived and implemented the Articulated Instructional Media Project (AIM) at the university. In this project, he demonstrated that by deconstructing the teaching process into specialties, employing specialists to work as members of teaching teams, and connecting (i.e., "articulating") a variety of communications media, the teaching programs were of higher quality than programs produced by individuals working alone, or any programs produced and delivered by only one communications medium (Wedemeyer & Najem, 1969). Of monumental historical importance, Wedemeyer's ideas were incorporated into the design of the then-revolutionary Open University of

the United Kingdom (OUUK), the first publicly funded, national autonomous degree-granting distance teaching university. Refer to Chapter 2 and Diehl (2011) for further coverage of Wedemeyer's importance to open and distance education.

In Europe, early scholarly writing based on empirical, systematic research is associated with two pioneers: Börje Holmberg in Sweden and Otto Peters in Germany. Holmberg's (1960) "On the Methods of Teaching by Correspondence" was described by Larsson (1992), as having initiated the first European awareness of correspondence study as a pedagogical methodology (p. x). Peters, first a researcher at the Education Center of Berlin and later at the German Institute for Distance Education Research (DIFF) at the University of Tübingen, inventoried distance education institutions in more than 30 countries and analyzed their systems. His research resulted in the development of a theory that compared distance education to "industrialized education" (Peters, 1967, 1973; Keegan, 1994). In the previous edition of the *Handbook*, Moore (2007b) includes chapters about Peters' ideas about "The Most Industrialized Form of Education" and Holmberg's conceptualization of "A Theory of Teaching-Learning Conversations."

In the U. S, during the decade of the 1970s, Wedemeyer pressed for a new concept of "independent study" to replace the label of correspondence education (1971). Influenced by Wedemeyer's (and also Gleason's) ideas, Michael G. Moore (1972) published his research leading to a theory of "learner autonomy" and incorporated it in his 1976 dissertation about self-directed learners who use correspondence study. By the 1980s Moore's work evolved into the well-known theory of "transactional distance" (Moore, 2007). The reader may refer to Black's (2004) dissertation and to Diehl and Cano' (2018) chapter in this Handbook for more descriptions of Wedemeyer's influence on theorists Holmberg, Moore, and Peters; and also refer to Bernath and Vidal (2007).

Emergence of Organized Research Centers

The second half of the 20th century saw a number of phenomena that led to growing interest in research; these included favorable experience and research findings about the effectiveness of distance education; the implementation of educational reforms and socio-economic justification for distance education, especially in developing countries; increased funding for research; and the birth of large single-mode distance institutions employing specialist academic researchers. All this resulted in the growth of many centers for distance education research, some of the most important being the University of Wisconsin Extension Department, United States; the Institute of Educational Technology (IET) at the OUUK; the Education Center of Berlin in collaboration with the DIFF at Tübingen; the Central Institute for Distance Education Research (ZIFF) at the FernUniversität, Hagen, Germany; the Centre for Distance Education (CDE) at Athabasca University, Canada; and the American Center for the Study of Distance Education (ACSDE) at the Pennsylvania State University, USA.

Most early research topics in the United States continued to be comparison studies of results of conventional face-to-face classroom instruction compared with mediated distance delivery, and comparisons of the effectiveness of different technologies and media. Popular topics, internationally, went beyond comparison studies, with a major focus on survey research. For example, OUUK's research arm investigated students' characteristics and attrition rates, under-representation of society's disadvantaged segments, and resistance to distance education as well as instructional effectiveness (McIntosh, Calder, & Swift, 1976; Glatter & Wedell, 1971).

In 1988, the First American Symposium on Research in Distance Education, sponsored by the ACSDE, brought together by invitation 50 American distance education leaders, and aimed to set a national research agenda for the United States. The symposium's results were showcased in Moore's (1990) book, Contemporary Issues in American Distance Education which, carried edited papers from the symposium, and provided the first compilation of American scholarly articles reflecting the state of American distance education research at that time. With the focus on international research,

a similar 1990 event, "Research in Distance Education: Setting a Global Agenda for the Nineties" was held in Caracas, Venezuela, organized by the ACSDE in collaboration with the International Council of Correspondence Education (ICCE). Representatives from five continents proposed a global research agenda highlighting the need for: (a) research on computer conferencing; (b) meta-analyses of researchers' values and assumptions; (c) comparative institutional studies; (d) analyses of students' life experiences; (e) methods and technologies of small island countries; (f) representation of women in distance education materials; and (g) influences of planning and personal, institutional, instructional contexts on student performance (Paulsen & Pinder, 1990, pp. 83–84).

Beginning in 1995, a number of factors—including a decline in funding, the retirement of some of the founding pioneers, the co-opting of distance education research questions by a wider population of academic specialists such as computer scientists and information technologists—impacted the research centers. The DIFF reorganized to become a broad-based education research center and donated its distance education materials to the ZIFF (Black, 2004). In 2005, the ZIFF closed and its personnel were assigned quality control tasks (www.fernuni-hagen.de/ZIFF/index.htm). The IET was directed to manage the OUUK's Jennie Lee Research Laboratories (http://www8.open.ac.uk/iet/main/core-services/jennie-lee-research-labs) and partnered with the United Kingdom's Centre for Research in Education and Educational Technology (CREET). The ACSDE began to wind down after its founder, Moore, left as director in 2002.

The early centers listed here are important for their part in establishing distance education as a field of study, and new centers soon sprang up to carry on the work. Prominent among these were: the Learning Resources Development and Support (LRDS) Center, formerly the Distance and e-learning Centre (DeC) at the University of Southern Queensland, Australia; the Center for Research in Distance Education (ASF) at the Carl von Ossietzky University of Oldenburg, Germany; the Norwegian Center for Distance Education (SEFU); and the South African Institute for Distance Education (SAIDE). Of course, many open universities have research centers. Some examples are: the Canadian Institute of Distance Education Research (CIDER) coordinated by the Centre for Distance Education Research at Athabasca University, Canada; the Research Institute of Open and Distance Education at the China Open University; the Staff Training and Research Institute of Distance Education (STRIDE) at the Indira Gandhi National Open University (IGNOU), India; the Center for Research in Distance and Adult Learning at the Open University of Hong Kong; the Institute of Distance Education at the Korea National Open University; and the Knowledge Media Institute (KMi), OUUK, created in 1995 to research the convergence of knowledge media—the cognitive and learning sciences, artificial intelligence and semantic technologies, and multimedia—associated with the OUUK's educational systems. For lists of international research centers, refer to Moore and Kearsley (2012, pp. 300–304).

Trends in the Late 20th Century

Throughout the remainder of the 20th century, many studies continued to focus on one particular research question (Moore & Kearsley, 2012, pp. 225–226) which learning environment or which delivery technology or media is more effective when the outcome variable is the average scores of two or more groups of learners? It might have been argued that the question was already answered in Dubin and Taveggia's (1968) seminal study, wherein they analyzed data from 7 million academic records and concluded that it is *not* difference in instructional method that determines student performance. Three decades later, citing a 1928 dissertation as the earliest study found, Russell (1999) once again summarized research studies that show "no significant difference" in the effectiveness of face-to-face compared to distance education systems (www.nosignificantdifference.org/).

Davies, Howell, and Petrie (2010) summarized trends in North American distance education research after they analyzed graduate students' dissertations and theses, 1998–2007. Consistent with Naidu's (2005) observations, as cited by Davies, Howell, and Petrie, they found that most research

consisted of descriptive self-reports, i.e., studies which addressed the perceptions, concerns, and satisfaction levels of various stakeholders within a single, particular distance education experience.

For another recent illustration of progress in research, in 2010 de Oliveira Neto and dos Santos analyzed the methods and research topics in a sample of Brazilian distance education publications, 1992–2007, and in a sample of articles from the *American Journal of Distance Education*, 1987–2006. The predominant research paradigm used in the Brazilian research was qualitative, with the predominant and the second-most predominant research methods being exploratory and case study respectively. The predominant Brazilian topic was management, and the predominant topic in the *American Journal of Distance Education* was evaluation.

Via a Delphi study, Zawacki-Richter (2009) examined experts' opinions on categories of research areas in distance education, their importance, and the most neglected areas of distance education research. He found that access and equity, the role of distance education in developing areas, student support services, evaluation, educational technologies, and instructional design are still of major importance. Given the globalization of education, Zawacki-Richter argues for more research pertaining to access, equity, and ethics. With 80% of all articles originating in five countries, a review of articles published from 2000 to 2008 in five leading distance education journals was completed by Zawacki-Richter, Bäcker, and Vogt (2009). They found research was strongly dominated by instructional design issues and individual learning processes. Important topics such as innovation and change management or intercultural distance learning phenomena were dreadfully neglected. They noticed a significant trend toward collaborative studies and qualitative research.

Based on what has been done, and more importantly *not* done, Berge and Mrozowski (2001), Moore and Kearsley (2012), and Zawacki-Richter et al. (2009) advocate for more research on policy and management, innovation and change, technology selection and adoption, and cost-benefit/value for investment. Zawacki-Richter, Bäcker, and Vogt emphasize the need for studies on educational globalization and cross-cultural aspects of learning. To raise the awareness of globalization, Moore (2011a) published two articles about globalization in the twenty-fifth anniversary issue of the *American Journal of Distance Education*. One article presents an American higher education perspective and the other a French viewpoint.

Moore (2011b) also observed, referring to the United States, that we need research on continuing and professional development, since only a scant amount has been published, primarily about nursing, accounting, librarianship, and engineering. Continuing and professional education is addressed by Gary W. Kuhne and George E. Krauss (2007) and Gary W. Kuhne (2012) in the *Handbooks of Distance Education*.

In 2009, Cavanaugh, Barbour, and Clark reviewed open access literature in K-12 online learning. They reported on a content analysis of the documents, past research topics and current trends, and recommended future research that establishes best practices for online teaching strategies, identifies strategies for ensuring learner success and/or adequate remediation, and encourages increased interaction between online and face-to-face students.

Professional Development of Distance Educators

Before the 1960s, the private Hadley School for the Blind in the United States was one of the few correspondence institutions to provide its instructors with in-service professional development. By the 1960s, the previously mentioned pioneers were delivering professionalizing programs. Holmberg participated in creating training courses for the European Association of Distance Learning (EADL); Peters created "Weekly Information Sheets" for DIFF professors and also for *Funkkolleg*, a radio college; Wedemeyer organized faculty lectures on correspondence teaching and developed the first graduate seminars in independent study offered in the adult education program at the University of Wisconsin-Madison. Michael Grahame Moore, Wedemeyer's research assistant, continued the seminars at Wisconsin from the mid-1970s to the mid-1980s. After moving to Penn State University in 1986, he developed a three-course graduate program and certificate in distance education,

still taught through Penn State's online World Campus. Moore's early experiments in the late 1980s used computer- and audio-conferencing technology to deliver his certificate program to students in Mexico, Finland, and Estonia, as well as the United States.

Beginning in the 1960s, professional development courses were delivered face-to-face for developing countries by the German Foundation for International Development, Bonn; the International Extension College (IEC), London; the Swedish Authority for Work in Developing Countries (SIDA); the University of Wisconsin Extension Department; and the International Council for Correspondence Education (ICCE) (Black, 2007). Other entities also delivered professionalizing courses via correspondence and other technologies and media. Among them were: Australia's South Australia College of Advanced Education, Canada's Open Learning Institute of British Columbia, West Germany's FernUniversität, Sweden's Hermods Correspondence School, the United Kingdom's Open University, and in the United States, the University of Wisconsin and Penn State University. Growth in research and theory building capacity, as well as development of academic programs about distance education as a profession prompted Holmberg to assert in 1987 that, "It is evident that a research discipline of distance education has emerged" (p. 20).

The 1993, "The Bangkok Project," sponsored by the International Council for Distance Education (ICDE), successfully demonstrated that online networking could provide cost-effective, yet meaningful, interactions among distance education professionals (Anderson & Mason, 1993, p. 15). By 1996, master's degrees in distance education, e.g., in Australia, India, and the United Kingdom, existed in several countries around the world (Scriven, 1996). Today, highly regarded professional development programs include: master's degrees in distance education at Athabasca University and the University of Maryland University College (UMUC) in partnership with the University of Oldenburg, Germany; the Penn State University graduate certificate in distance education delivered by Penn State's World Campus as part of the adult education Master's program; certificate programs at the University of Wisconsin-Madison and the State University of West Georgia; courses with Indiana University's School of Continuing Studies; and programs with the OUUK. According to Fahlman (2009), the first North American doctoral program in distance education was launched at Athabasca University in 2008. A MarylandOnline inter-institutional project to train higher education adjunct faculty to teach online is reported by Shattuck, Dubins, and Zilberman. (2011).

Two important international associations that support distance education professionalizing projects are the Commonwealth of Learning (COL) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). COL is a resource for training in the policies, methodology, and practice of open, distance, and technology-mediated learning in associated countries. COL has established a network of Honorary Chairs in Open and Distance Learning, often in collaboration with UNESCO, which operates a Chairs Programme across a range of disciplines (https://www.col.org/about/honorary-col-chairs). UNESCO has set policies regarding distance education for international development and has created some courses of its own. For example, UNESCO's Institute for Integrating Technology in Education (IITE) sponsored a course "Information and Communication Technologies in Distance Education" (http://unesdoc.unesco.org/images/0012/001293/129395e.pdf) to teach professionals in many regions of the world. Recently, UNESCO published case studies in a report "ICT: Case Studies from Asia and the Pacific" ((http://www.unesco.org/new/en/communication-and-information/resources/publications-and-communication-materials/publications/full-list/ict-in-teacher-education-case-studies-from-the-asia-pacific-region/). A source of basic information on UNESCO and COL is Gutierrez (2010).

Professional Associations

For promotion of sound practices among correspondence and home study schools, two associations—the National University Extension Association (NUEA), which represented university correspondence

independent study educators; and the National Home Study Council (NHSC), which represented for-profit correspondence *home study* schools—stand out as pioneering organizations. The NUEA held its first meeting in 1915 at the University of Wisconsin (Watkins, 1991, p. 17) and in 1924 codified its standards for correspondence study. In 1980, the NUEA became the National University Continuing Education Association (NUCEA). In 1996, to incorporate international educators, the NUCEA dropped the word national and became the University Continuing Education Association (UCEA). To reflect changes in member programs, the name was changed in 2010 to the University Professional and Continuing Education Association (UPCEA). UPCEA encourages good practice through its Distance Learning Community of Practice and quality awards.

The Correspondence Study Division (CSD), a powerful NUEA subgroup, established correspondence (i.e., independent study) as a distinct field of practice within university continuing education; created the first criteria for standard practice, published the predecessor of *Peterson's Guide* to identify reputable programs, and researched the effectiveness of the correspondence format (Pittman's interview with Powell, 1991). Nudged by Wedemeyer, the CSD, in 1969, became the Independent Study Division (ISD), a title which emphasizes the learner rather than the educational delivery mechanism (Moore, 2007c, p. 90) and a title which reflects the many types of technologies being used in addition to print-based correspondence (Feasley & Bunker, 2007, p. 18). The title held until 1998, when NUEA abolished divisions (Pittman, 1998). CSD/ISD leaders included G. B. Childs, Nebraska; J. L. Davies, Iowa; B. Powell, Georgia; A. Rowbotham, California; and C. A. Wedemeyer, Wisconsin.

In 1926, "with the help of a grant from the Carnegie Corporation and the National Better Business Bureau" (Ludlow's, 1987, interview with Lambert, p. 67), the National Home Study Council (NHSC), (whose first director was Noffsinger,) was a trade association formed in 1926 by some of the reputable proprietary for-profit schools (Pittman, 1990, p. 68). The NHSC aimed to set standards for home study, i.e., correspondence instruction delivered by private institutions. In 1959, the United Stated Office of Education recognized the NHSC as a national accrediting agency (Feasley, 2003, p. 39), and today the Council for Higher Education (CHEA) also recognizes the Council as an accrediting agency. In 1994, to reflect the incorporation of newer technology, the NHSC became the Distance Education and Training Council (DETC). Today, through its Accrediting Commission, it accredits the main for-profit home study schools, more than 60 of them.

Two other more recently established professional associations stand out as important: the American Association for Collegiate Independent Study (AACIS), which in 2010 became the Association for Distance Education and Independent Learning (ADEIL); and the United States Distance Learning Association (USDLA). Formed about 20 years ago, AACIS advances the interests of independent study professionals, focusing on distance learning by individuals rather than distance learning in groups, and initially supporting mainly continuing professional education. For a decade, AACIS (now ADEIL) has continued to perform and publish a yearly survey—a survey originally conducted by the UCEA—of independent study programs in the United States. ADEIL annually evaluates, selects, and awards quality distance programs and courses. Created in 1987, the USDLA, which promotes professionalizing activities, currently encompasses international as well as national members and includes K-12 education, higher education, continuing education, corporate training, military and government training, home schooling, and telemedicine. The USDLA involves senators and representatives in its conferences and national policy forums and aims at including state and federal government participation in the association. Its annual awards have been reported in the journal *Distance Learning* (Anonymous, 2010) and are listed online at https://www.usdla.org/awards/.

A relatively new professional association, the International Association for K-12 Online Learning (iNACOL), has the potential to be important in K-12 distance education. The Association The

International Association for K-12 Online Learning "facilitates collaboration, advocacy, and research to enhance quality K-12 online teaching and learning" (www.inacol.org/about/index.php).

At an international level, in 1938 Canadian and U.S. visionaries created the International Council of Correspondence Education (ICCE). ICCE (now International Council for Open and Distance Learning, or ICODL) represents public and private schools, colleges/universities, adult and continuing educators, and university extension. ICODL provides a structure, forum, and network to facilitate information exchange and idea development; sponsors emerging regional conferences; provides non-formal professional development; and provides a vehicle for evaluating practice and systems. Referred to as the "International Linking Organization" by Feasley and Bunker (2007), ICCE has played a key role in the networking of distance educators around the world. According to Holmberg, Peters, and Moore (Black, 2004), from its inception, ICCE helped develop a community of scholars, "a family of experts," who supported one another emotionally, socially, and intellectually. In fact, ICCE globally ended the isolation imposed on correspondence study leaders by traditional face-to-face educators. Known for building an international network, Wedemeyer, ICCE president from 1969 to 1972, moved ICCE ahead. He created the first ICCE newsletter, accomplished UNESCO recognition, generated the first computerized membership list and initiated a modest research and training project.

Beginning in 1965, ICCE leadership and conference attendance shifted dramatically (Black, 2004; Bunker, 2003, pp. 223–224) when representatives of European mega open universities began attending ICCE conferences. Evans and Nations (2003) conceptualize this as the "distance education renaissance," wherein newcomers joined and worked beside early correspondence study pioneers. The open universities' diverse academic specialists, e.g., instructional designers, information technologists, and media experts, began to dominate. To reflect its changing membership, in 1982 ICCE dropped the term *correspondence* from its name and added *open* and *distance*, becoming the International Council for Open and Distance Education (usually referred to still as ICDE). In 1988 ICDE established a permanent secretariat in Oslo, Norway, with a full-time paid Secretary General. ICDE has regional memberships and sponsors conferences around the world. An example of an ICDE member institution that launched an Open Educational Resource forum in the Asia region is Wawasan Open University, Malaysia, the youngest among Asia's 70 open universities (www.icde.org/Launch+of+OER+Asia.b7C_wJjUYk.ips). ICDE's awards for excellence can be found at https://icde.memberclicks.net/icde-prize-of-excellence-winners.

As distance education evolved, professional associations continued to emerge. A typical association is the Open and Distance Learning Association of Australia (ODLAA), which had been known as Australian and South Pacific External Studies Association (ASPESA) until 1993. Another is the Canadian Association of Distance Education (CADE), since 2005 known as the Canadian Network for Innovation in Education (CNIE). Some other important associations are: the United Kingdom's Council of Educational Technology (CET); the European Council for Education by Correspondence (CEC), established in 1963; the European Home Study Council (EHSC), established in 1968; and the European Association of Correspondence Schools (AECS), a merger in 1985 between the CEC and the EHSC.

A sampling of relatively new associations includes the Asian Association of Open Universities (AAOU); the European Distance and e-learning Network (EDEN) and the Commonwealth of Learning (COL). EDEN appears "to have recognized the need for more and better research and scholarship in Europe and has taken on the challenge of stimulating and nurturing a scholarly as well as the practitioner's interest in distance education" (Moore, 2007a, p. 55). COL was established in 1988 to support distance education scholarship, research, and outreach/service for the group of nations known as the Commonwealth, including Australia, Canada, Great Britain, India, New Zealand, and Pakistan. COL, which frequently partners with UNESCO, is important for setting distance education research agendas for developing countries. COL and UNESCO have directed their attention "to the cultural differences and a better understanding of the relationships between different identities by the promotion of cross-border

collaboration in distance education" (Gutierrez, 2010, p. 17). For example, during the 24th ICDE World Conference in October 2011, the Open University of China and the University of Maryland University College, USA, signed a cooperation agreement. UNESCO and COL have published a set of guidelines for the use of open educational resources (OER) in higher education ((http://www.unesco.org/new/en/communication-and-information/resources/publications-and-communication-materials/publications/full-list/guidelines-for-open-educational-resources-oer-in-higher-education/).

For more on the histories of distance education associations, refer to Feasley and Bunker's (2007) "A History of National and Regional Organizations and the ICDE" and Chen's (2009) "History of Distance Learning Associations." For a list of open and distance learning resources, refer to COL's website (https://www.col.org/resources).

Lectures, Seminars, Symposia, Workshops, and Conferences

A marginalized group in higher education, correspondence educators depended on networking among themselves to enjoy mutual support. In 1891, the First National Extension Conference brought together educators interested in correspondence study (Watkins, 1991, p. 4). The CSD/NUEA activities of the 1950s and 1960s and the ICCE conferences of 1948 and 1953 lifted correspondence instruction's status within higher education, stimulated an international movement, and established some U.S. correspondence educators as international leaders.

With Wedemeyer and Childs as keynote speakers, a 1962 conference, "Conference on New Media," funded by the United States Department of Education (Erdos, 1992, pp. 68–72), brought together specialists in audio-visual media; programmed instruction; field service bureaus; motion picture, radio, and television production; and correspondence study. During the 1970s, at distance education conferences, specialists not only from other fields but also from developing countries came in larger numbers. In fact, developing countries submitted the majority of the papers considered for the 1979 OUUK's 10th anniversary conference (Neil, 1981). Regional conferences during the 1980s in Europe were funded by various groups, e.g., the EHSC and the European Association of Distance Teaching Universities (EADTU), the European Union (EU), the United Kingdom's CET, and the European CEC. In the United States, the University of Wisconsin Extension sponsored its First Annual Conference on Distance Teaching and Learning in 1985 with Michael Grahame Moore as keynote speaker. ICDE world conferences grew in size and frequency and remained important to the development of scholarship. Bunker (2003) and Feasley and Bunker (2007) describe ICDE conferences, 1938–2001. Current conferences are identified in the appendices of Moore and Kearsley (2012, pp. 293–304).

Publications and Other Media

Among early publications that helped lay the foundation for study and scholarship are the newsletters of NUEA (NUEA, 1952, as cited in Wright, 1991, p. 42) and the *Home Study Review* by NHSC. Also important are: Wedemeyer's 1963 film *The Postage Stamp Classroom*, a story about correspondence study; Wedemeyer's (1963, 1966) *Brandenburg Essays on Correspondence Instruction*; Wedemeyer's ICCE's newsletters, first published in 1971 as well as CET's *Open Learning Guides* of the 1970s, created by the United Kingdom's National Extension College (NEC) (Lewis & Paine, 1985, p. vii).

Three bibliographies of significance are those by Childs (1960), Mathieson (1971), and Holmberg (1968, 1977). Two reports of historical value are Wedemeyer's (1968) reports on the University of South Africa and on the AIM Project (Wedemeyer & Najem, 1969). Important documents include the ICCE conference proceedings and occasional papers by Australia's Deakin University, the Netherlands' Open Universiteit, the *Broadsheets on Distance Learning* by the United Kingdom's International Extension College; and publications of Spain's *Universidad Nacional de Education a Distancia* (UNED).

Prominent among American documents of historical importance are the American Center for Study of Distance Education (ACSDE)'s monographs, research reports, and books of readings.

Early journals published articles aimed at improving practice rather than create/produce scholarship. Examples include: the NHSC's *Home Study Review*; *Epistolodidaktika*, first published in Germany in 1963 and subsequently by the EHSC; and the UKOU's *Teaching at a Distance*, published beginning in 1975, renamed *Open Learning* in 1986, and today renamed *Open Learning: The Journal of Open, Distance, and e-learning*.

During the 1980s, several new journals reported on research and theory rather than only on practice. Most important are: *Distance Education*, started in 1980, by ASPESA and today the official journal of the ODLAA; the *Journal of Distance Education*, started in 1986 by CADE and currently published under its new name CNIE, and the *American Journal of Distance Education (AJDE)*, founded in 1987 by Michael Grahame Moore at Penn State. The *AJDE* paved the way for greater external visibility and recognition of distance educators by the higher education community in the United States and abroad, and provided budding United States distance education scholars—often a marginalized group in higher education—a place to publish, "increasing the opportunity for the exchange of ideas and information" (Almeda's interview with Childs, 1988, p. 70).

Other important journals and publications originating in recent years include: Athabasca University's *International Review of Research in Open and Distance Learning*, West Georgia University's *Online Journal of Distance Learning Administration*, the *Quarterly Review of Distance Education*, the *Turkish Online Journal of Distance Education*, and the Sloan Foundation's *Journal of Asynchronous Learning Networks (JALN)*. Refer to Moore and Kearsley (2012, pp. 296–298) for a list of current journals and directories. Also, refer to Olgren's (2011) list of journals and periodicals found at http://depd.wisc.edu/html/mags3.htm.

Two of the first books about correspondence education, both published in 1926, are *The University Afield* by Hall-Quest and *Correspondence Schools, Lyceums, Chautauquas* by Noffsinger. Published in 1933, a third book, Bittner and Mallory's *University Teaching by Mail*, illuminates correspondence study's origins and its integration into American universities. Three decades later, several more books contributed to emerging scholarship in the United States (Pittman, 1990, pp. 69–71). The books are: *Correspondence Instruction in the United States* (MacKenzie et al., 1968), *New Perspectives in University Correspondence Study* (Wedemeyer & Childs, 1961), *The Changing World of Correspondence Study: International Readings* (MacKenzie & Christensen, 1971), and Wedemeyer's (1963, 1966) *The Brandenburg Memorial Essays*.

Catalyzed first by the emergence and proliferation of the open universities in the 1970s and 1980s, and then by the advent and increasing popularity of online delivery, the quantity of books about distance education has exploded. Among the most valuable books for studying scholarship are: *Learning at the Back Door: Reflections on Nontraditional Learning in the Lifespan* (Wedemeyer, 1981) and *Distance Education: International Perspectives* (Sewart, Keegan, & Holmberg, 1983, 1988). Three other valuable books in the study of history are *The Distance Teaching Universities* (Rumble & Harry, 1983), *The Ivory Towers Thrown Open* (Reddy, 1988), and *Distance Education in Canada* (Mugridge & Kaufman, 1986).

In the United States, Moore's (1990) anthology *Contemporary Issues in American Distance Education* reported on the state of scholarship and practice. Another anthology, Garrison and Shale's (1990) *Education at a Distance: From Issues to Practice*, includes a history by Moore's student Sherow co-authoring with Wedemeyer (1990). Their chapter "Origins of Distance Education in the United States" includes a brief explanation of Wedemeyer's AIM system and its relationship to the OUUK and the influence of both AIM and the OUUK on distance education.

An outstanding book is *The Foundations of American Distance Education* (Watkins & Wright, 1991). According to historian Von Pittman (2003), the Watkins and Wright book "represents the single most important contribution to the history of collegiate correspondence study" (p. 23). Watkins' and

Wright's history begins in 1882 with the founding of the University of Chicago's correspondence study program and covers the next 100 years of achievements, ideas, issues, and research in collegiate distance education.

Renee Erdos, the first distance educator awarded a Fulbright Scholarship and President of ICCE in the late 1960s, studied the educational systems at 18 correspondence study institutions in Asia, Canada, Europe, and in the United States. Erdos (1992) reports her impressions and findings in *Teaching Beyond the Campus*. A more recent, valuable book is Sarah Guri-Rosenblits' (1999) *Distance and Campus Universities*.

Peters' ideas became well-known to English-speaking scholars through Keegan's (1994) *Otto Peters on Distance Education: The Industrialization of Teaching and Learning* and eventually through Peters' own writing, e.g., *Learning and Teaching in Distance Education* (Peters, 2001), *Distance Education in Transition*, fourth edition (Peters, 2004), and Peters' (2007) chapter "The Most Industrialized Form of Education" in Moore's (2007b) *Handbook of Distance Education*.

A standard textbook in the United States is Moore and Kearsley's (1996, revised in 2005) *Distance Education: A Systems View*. The textbook, in addition to English, is available in Chinese, Korean, Portuguese and Japanese. Published again in 2012, the textbook is now titled *Distance Education: A Systems View of Online Learning*. Similar to Moore and Kearsley (2012), is the 2011 fifth edition of *Teaching and Learning at a Distance: Foundations of Distance Education* edited by Simonson, Smaldino, Albright, and Zvacek.

With their descriptions of research intended to stimulate and support better research and improved practice, the *Handbooks of Distance Education* (Moore & Anderson, 2003 [2004 paperback]; Moore, 2007b) have become definitive scholarly reference books. Extolling the importance of the 2007 *Handbook*, Beaudoin (2010) refers to it as "a sort of *magnum opus* in the field" (p. 58) and points out that the *Handbook* includes "a valuable global perspective" (p. 58). Edited by Martine Vidal, Monique Grandbastien, and Pierre Moeglin, a 2009 issue of a leading French journal *Distances et savoirs* published a synopsis of the 2007 *Handbook of Distance Education*. According to Moore (2009), *Distances et saviors*' purposes were "to introduce our French colleagues to the American research literature" and "to prepare the ground for future exchanges of ideas and information between Anglophone and Francophone scholars and students in our field" (p. 536). Beginning with its 25th anniversary issue in 2011, Moore (2011a) the *American Journal of Distance Education* reprinted the bibliographic essays—summaries of the various sections of the 2007 *Handbook of Distance Education* complemented by a contrasting French view.

Important but much neglected topics—distance education planning, costing, management, and decision making—were reported at an international level in the 2008 book *Economics of Distance and Online learning: Theory, Practice and Research* edited by Bramble and Panda. Because of increasing globalization and its multi-cultural impacts; also important, with its first section devoted to "Diversity in Distance Education," is the *International Handbook of Distance Education* (2008), edited by Evans, Haughey, and Murphy.

Within the past decade, many books of value to both scholars and practitioners have been published. One is the second edition of the *Encyclopedia of Distance Learning* edited by Rogers, Berg, Boettcher, Howard, Justice, and Schenk in 2009. Its four volumes and more than 100 chapters written by international contributors from many countries cover distance learning issues, concepts, trends, and technologies. A second is *Contemporary Perspectives in E-Learning Research* published by Conole and Oliver (2007). A third book is *Web 2.0-Based E-Learning: Applying Social Informatics for Tertiary Teaching* edited by Lee and McLoughlin (2010), a book which presents (2010). Presenting strong research-based findings, the book contributes to our Web 2.0 e-learning knowledge base.

Michael Beaudoin (2010) identified five of the "significant contributions to the field" (p. 60) to end his five-year tenure as the *American Journal of Distance Education*'s book editor. Two of the five are especially important for historians. The first is Moore's (2007b) *Handbook of Distance Education*, which

contains several chapters devoted to history. The second is Burge's (2007) *Flexible Higher Education: Reflections from Expert Experience*. Her book provides "insights, through reflection and commentary, on what has worked and why, based on the careers of these true believers and shapers of the field" (Beaudoin, 2010, p. 59).

Prominent editors such as Desmond Keegan, Fred Lockwood, Michael Grahame Moore, and Uli Bernath are important for creating whole series of publications on distance education that have promoted and advanced scholarship. Another prominent publisher is Tony Bates, who is the author of nine books and whose research groups at the OUUK, Open Learning Agency of British Columbia, and University of British Columbia published "over 350 papers in the area of distance education and the use of technology for teaching" (Awalt, 2007, p. 105).

In the United States, under Moore's leadership, the ACSDE published more than 20 monographs between 1987 and 1997 (e.g., Moore & Thompson, 1990, 1997; Munro, 1998; Wagner & Koble, 1998). The ACSDE also published historically important edited books; for example, (Moore & Shin, 2000), a collection of reprinted interviews (interviews first published in the *American Journal of Distance Education*) with distance education leaders of the 1980s and 1990s and a special original interview with pioneer Michael Grahame Moore (pp. 214–221). From 1987 to the present, the *American Journal of Distance Education* has published interviews referred to as "Speaking Personally" with pioneering leaders like Charles A. Wedemeyer, Michael P. Lambert, Gayle B. Childs, Betsy Powell, Tony Bates, and Börje Holmberg (to name a few). The interviewees have "lived" distance education's history; thus, via first-person research data, the collection of interviews illuminates 25 years of distance education history.

One of the earliest comprehensive, databases (published in German) of international distance training and education systems was created in the 1960s by Peters as part of his comparative research and theoretical work (Keegan, 1993, pp. 2–3). Another of the earliest, large centralized databases—the International Center for Distance Learning (ICDL)—was established at the OUUK (Harry, 1986, 1992). One of the first online databases of information, ideas, and discussions, the DEOS-L listserv was developed at Moore's ACSDE in 1991, had 4,000 participants in 60 countries by 1996, and is still running.

Moore (1998) describes working with the World Bank in 1997 to create a database, Global Distance Education Network (GDENet or DistEdNet), designed to provide information about distance education to developing countries. The database, later administered by COL, consisted of a World Bank core site and regional global sites, e.g., the East Asia Global Distance Education Net (www.ouhk.edu.hk/cridal/gdenet/) designed and produced in collaboration with the Open University of Hong Kong's Centre for Research in Distance & Adult Learning. Gutierrez (2010) describes the Global Learning Development Network created by the World Bank. She writes, "This educational endeavor, linking resources, knowledge, and materials, is what the future of distance education looks like. In many parts of the world this is the only way to achieve an equitable and sustainable education."

Important doctoral dissertations of the 1960s and 1970s include: *William Henry Lighty: Adult Education Pioneer* by Axford (1961), which according to Pittman (1990) "stands alone as a comprehensive account of the career of a seminal figure in collegiate correspondence study" (p. 72); *Die Didaktische Struktur des Fernunterrichts. Untersuchungen zu einer Industrialisierten Form des Lehrens und Lernens* by Peters (1973); *Investigation of the Interaction Between the Cognitive Style of Field Independence and Attitudes to Independent Study Among Adult Learners Who Use Correspondence Independent Study and Self-Directed Independent Study* by Moore (1976); and *College-Sponsored Correspondence Education in the United States: A Comparative History of Its Origins (1873–1915)* and *Its Recent Developments* by Gerrity (1976), a dissertation that Pittman (1990) states, "is arguably the best single historical work on collegiate correspondence education" (p. 70).

From 1995 to 2006, the number of doctoral dissertations and master's papers about distance education exploded, comprising a valuable body of unpublished secondary literature (Pittman, 2003). An April 5, 2006 search of UMI Dissertation Abstracts Online by keyword "correspondence study" produced only 40 citations, 20 of which were dated from 1981 to 2001, and 20 from 1932 to 1976. On the same date, a search by keyword "distance education" produced 1178 citations with 947 of the citations dated 1995–2006, and 231 dated 1981–1994. The earliest data-based publication under "distance education" was dated 1981. An analysis of North American theses and dissertation, 1998–2007, by Davies, et al. (2010) showed that the number of North American dissertations and theses has remained fairly stable. Whether quantity is exploding or leveling off, a past problem continues today, which is that much research is a-theoretical! The field needs more research that is theory-based, grounded in what we already know about education at a distance, and also is carried out applying rigorous methodologies (Moore & Kearsley, 2012; Davies et al., 2010).

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2

CHARLES A. WEDEMEYER AND THE FIRST THEORISTS

William C. Diehl and Leslie Cano

In the previous *Handbook* chapter on the history of scholarship, Black (2018) introduced Charles A. Wedemeyer and his early advocacy for empirical research in distance education. This chapter includes historical information on Wedemeyer's contributions and influences, and also expands upon the work of Diehl (2012), with more emphasis on the scholarship and theoretical contributions of other pioneering theorists in the field of distance education: Börje Holmberg, Otto Peters, and Michael Grahame Moore.

Innovation, Leadership, and Influence

Charles A. Wedemeyer (1911–1999) devoted his life to the field of education, and in particular, distance education. Recognized as an innovator, leader, and authority by his contemporaries, he was one of the first educators to advocate for scholarship in what was previously known as the field of correspondence study.

Wedemeyer began to develop a systems approach in the emerging field of distance education as a way of providing education to nontraditional adult students, or "back door learners" (Wedemeyer, 1981, p. 19), as he referred to them. His cradle-to-grave "open" concept educational system applied technology to meet the goals favored in Humanistic psychology.

Wedemeyer emphasized that there should be an emphasis on student-centered learning. Independent learning skills are needed so that students can pursue lifelong learning at any point in their lives when they wanted or needed to learn. Wedemeyer's (1971a) definition of independent study is:

> various forms of teaching-learning arrangements in which teachers and learners carry out their essential tasks and responsibilities apart from one another, communicating in a variety of ways, for the purposes of freeing internal learners from inappropriate class pacings or patterns, or providing external learners opportunity to continue learning in their own environments, and developing in all learners the capacity to carry on self-directed learning, the ultimate maturity required of the educated person. Independent Study programs offer learners varying degrees of freedom in the self-determination of goals and activities, and in starting, stopping and pacing individualized learning programs which are carried on to the greatest extent possible at the convenience of the learners.

With an emphasis on the learner, the definition also introduced the idea of a domain of education in which teachers and learners are physically separated from one another, a defining characteristic of distance education. His notion of independent study considered both *internal study* and *external study*, and that independent study could be applied in both face-to-face and distance education programs. Lifelong learning could best happen via open and flexible educational systems. Two innovative systems were designed, based on his ideas. These were the Open School system (Wedemeyer, 1971c; Wedemeyer & Ghatala, 1971; WHA, 1970) for the State of Wisconsin (which did not come to fruition due to a shift in political leadership) and the Articulated Instructional Media Program (AIM). Wedemeyer's lessons learned from the AIM experience played a major role in the development of the Open University of the United Kingdom (OUUK), consequently impacting the world of higher education (Diehl, 2011a).

Wedemeyer's Professional Journey

As early as the 1930s and early 1940s, Wedemeyer demonstrated his abilities to adopt and to apply new technologies as a means of delivering educational opportunities to nontraditional students. During that period, he wrote scripts and hosted the radio show *Literature Then and Now* for the Wisconsin College of the Air. By the 1950s, he had become the chairman of the National University Extension Association (NUEA) correspondence study division committee on radio and TV.

During World War II, Wedemeyer designed, developed, and edited course books used for teaching armed services personnel on ships at sea and in other unconventional learning environments. After the war and through the mid-1950s, he was director of Correspondence Study at the University of Wisconsin, one of the largest correspondence study programs in the world. Over 8,500 students participated in more than 400 courses, and over 85,000 men and women in the Air Force, Army and Navy took courses in a program that linked Wedemeyer's program with the United States Armed Forces Institute (USAFI). The number of USAFI related lessons grew to 300,000 at its peak (UWEX, 1956).

In early 1958, Wedemeyer and the University of Wisconsin began to combine television with college-level correspondence study, a pioneering experiment that used multiple media for teaching-learning activities and required a team teaching approach; with specialists working together to design, develop, deliver, and assess the project.

In the 1960s, Wedemeyer's experimentation with multiple types of media and the use of course teams continued with the AIM program. Toward the end of this period, Wedemeyer pioneered the application of another significant development in education: satellite technologies.

When the use of satellites was in its earliest stages of development, Wedemeyer worked with colleagues such as Richard G. Lawson at the University of Wisconsin to develop an experimental program called the Educational Diffusion and Social Application of Satellite Telecommunications (EDSAT). Situated on the Madison, Wisconsin campus, the project was a joint program with the Space Science and Engineering Center, UNESCO, and ICCE.

In 1975 as a consultant for the U.S. State Department, Wedemeyer conducted educational satellite demonstrations during a trip through Indonesia, Malaysia, Singapore, Thailand, and Japan. During his tour, he demonstrated the potential of teaching over vast distances by facilitating his regular seminar at the University of Wisconsin-Madison via satellite.

This brief chronological description of Wedemeyer's professional life illustrates some of the diversity of his activities. Throughout this period, he also held leadership positions in several professional associations. For example, he served as president of and a member of the executive boards of the International Council of Correspondence Education (ICCE) and the National University Extension Association (NUEA). He was a director of the Correspondence Study Division for the NUEA, and at USAFI he was director of Instruction and Evaluation. Later, at Wisconsin, he was Director of AIM and the AIM Board, and he held the William H. Lighty Professor of Education Chair. Wedemeyer

was the recipient of numerous awards, including the Gayle Childs Award for Distinguished Service and an honorary doctorate by the OUUK. He was also honored with a variety of public appointments. For example, he became the First Kellogg Fellow at Oxford University, and served on the Wisconsin Governor's Commission on Education and the Governor's Educational Advisory Committee.

Wedemeyer and the Open University of the United Kingdom

In 1965, several years before the Open University of the United Kingdom (OUUK) was launched, Wedemeyer (as the first Kellogg Fellow at Oxford University), shared his experience, ideas, and lessons learned from the AIM Project in lectures and informal conversations with several key individuals who would become the OUUK's planners (Wedemeyer, 1968, 1971b).

One of those individuals, Walter James, the new OUUK director of studies and one of the first senior appointees at the new institution, wrote to Wedemeyer and told him that their conversations in 1965 at Nottingham had shaped the plans that he was going to implement. James asked Wedemeyer for advice, and Wedemeyer (1969c) told him that he would "help in any possible way." What was at first known as *University of the Air* shared several of the characteristics of Wedemeyer's AIM project, and more importantly, Wedemeyer was able to identify AIM's weaknesses—which would benefit the new OUUK. For example, the AIM project had not owned its own production facilities and did not have organizational autonomy in finances and awarding of credits and degrees, and Wedemeyer urged that the new British institution should heed this lesson (Diehl, 2011a). Even the *course team* concept for the OUUK had been developed by Wedemeyer as early as 1959 in Wisconsin.

In April of 1969, Secretary-Designate of the Open University Planning Committee Anastasinos Christodoulou, arranged a meeting for Wedemeyer to meet with the new vice-chancellor of the new university, Walter Perry (Wedemeyer, 1969a). Perry subsequently invited Wedemeyer to become a consultant in Milton Keynes, where the new OUUK campus was to be built. In October 1969, the offices of the OUUK moved from London to Milton Keynes, where renovations and the first phases of administrative and course development began in earnest (Perry, 1976; Stabler, 1986; Tunstall, 1974).

There Wedemeyer worked with Perry and with various teams of academic and media specialists in the development of mediated instructional materials, and on the administrative and support systems. Wedemeyer gave weekly lectures on theory and media instructional processes, faculty development seminars, and also led a seminar for BBC producers and directors, held meetings with various other teams, and advised individuals associated with the OUUK and BBC (Wedemeyer, 1969a, 1971b).

After leaving Milton Keynes, Wedemeyer carried on correspondence from Wisconsin with OUUK planners until the OUUK opened its doors in 1971. In 1972, Wedemeyer returned to London and interviewed colleagues Walter Perry and Walter James about the early days at the OUUK. The BBC broadcast was titled *Conversations* ("Conversations," 1972). The OUUK was a success from the start, and its attraction as an innovative educational model was reflected by the British Prime Minister, Harold Wilson (who provided the political leadership that would help to create the nationwide experimental OUUK program). He wrote that he had been "besieged by University Presidents, Senators, Congressmen, and Presidents of the U.S. to tell them more about the achievements of the Open University" (Wilson, 1976, p. xii).

In 1975, with the OUUK successfully established, Wedemeyer received the third honorary doctorate awarded by that educational institution, putting him in the company of former recipients Paulo Friere and Lady Plowden. During the award ceremony, OUUK Professor Walter James (1975) spoke about Wedemeyer's contributions:

> What's to come in open independent study for the adult learner is still unsure. What is sure is that Chuck Wedemeyer, who more than any other person secured lift-off for the

> vehicle, will be developing its guidance and control systems, and sending it further into the unknown, beyond the limit of its present orbit. Those whom such education has reached out to and touched owe more than they know and far more than they can repay to him. The Open University—an inheritor of his inspiration, a beneficiary of his advice, and a learner from his wisdom—has the privilege of offering a token on their behalf.

In his book *Learning at the Back Door: Reflections on Nontraditional Learning in the Lifespan*, Wedemeyer (1981, p. 60) identified "nontraditional, distance, open or independent learning" as "a single great new development in education." Nearly three decades later, Moore (2009) identified two "watershed events" which were the "beginning of a global, worldwide paradigm shift in higher education." The two events were AIM and the Open University.

Wedemeyer's Scholarship

Over the course of his career from the 1930s to 1980s, Wedemeyer published 139 known publications. In the first two decades, topics ranged from curriculum, journalism, English and reading in correspondence study, book reviews, naval warfare training, college composition, morale, opportunities for adult learners, gifted achievers and non-achievers, and adult education agencies. Beginning in the 1960s, his focus was mainly on correspondence study, with a focus on practice—which included the use of technology in correspondence study (e.g., radio, video, television, and satellites) (Diehl, 2011a).

During this time, the idea of individual students and articulating programs to serve students was also beginning to formulate in his writing. *New Perspectives in University Correspondence Study* (Wedemeyer & Childs, 1961), which describes the field at the time, was published and translated into German and Spanish (Pittman, 2003). Twenty-one of the publications during the 1960s pertain to a survey of some area of the field. The 1960s also saw the publication of the *Brandenburg Memorial Essays I and II* (1963, 1966b), and in 1969, *AIM: From Concept to Reality* was published (Diehl, 2011a).

In the *Brandenburg Memorial Essays II*, Wedemeyer (1966b, p. 142) wrote an article titled "Extension Education and Its Tools in the Next Half Century," in which he asked: "what will the University extension look like in 50 years?" In this article, he considered the characteristics of the teacher, student, and courses that would be taught in Extension over the next 50 years. He predicted that the future Extension teacher would be better trained and more versatile than the teacher of the 1960s, and that he/she would be specifically trained for teaching at a distance and in nontraditional methods. The teacher would be able to use a variety of media and methods and would be supported by specialists who were trained in systems design, coordination, media, and methods. Working together, they would produce courses that were part of a full curriculum. Extension curricula would not be bound by institution but would "have regional or even national acceptability and validity" (Wedemeyer, 1966b, p. 145), and teachers would be primarily content specialists who would spend more time on materials which created a teacher "presence." Interdisciplinary teams would create courses to meet the needs of the adult learner, and Extension teachers' degree courses would be available anytime and anywhere "using the same system of team design, development and production of courses. Credit and degree courses would be taught directly by the degree teachers to students both on and off campus using the same process, media and methods" (Wedemeyer, 1966b, p. 147). Extension teachers would be involved in courses that range from a beginning college level to well beyond the baccalaureate level; and adults, because of the new society and the need for lifelong learning, would continue studies later into life (Diehl, 2011a).

Wedemeyer (1966b) predicted that the Extension student of 2015 would be more accustomed to learning independently, would be better versed in the use of media, and "could accommodate periods of guided self-study, tutorial learning, group learning, residential study library work" (pp. 148–149).

Wedemeyer and Three Pioneering Theorists (Holmberg, Moore, and Peters)

Of the hundreds of distance educators Wedemeyer corresponded and interacted with during his career, three are especially important regarding the development of theory and scholarship in the field: Börje Holmberg, Michael Grahame Moore, and Otto Peters. Chapters by Peters and Holmberg can be found in earlier editions of this *Handbook* (see Holmberg, 2003, 2007; Peters, 2003, 2007).

The following summary of the evolution of Wedemeyer's relationships with Holmberg, Moore, and Peters provides insights into the history of theory and scholarship in the field of distance education.

Wedemeyer and Börje Holmberg

As a distance education theorist, Börje Holmberg is known for the development of what he described as "a predictive theory" that applies an instructional methodology grounded in using a teaching-learning conversational style and in making use of "empathetic emotions" (Bernath & Vidal, 2007, p. 430). Holmberg first published his ideas in *On the Methods of Teaching by Correspondence* in 1960, and referred to his theory as "guided didactic conversation." Later, he moved to a discussion of "teaching-learning conversations" (Holmberg, 2003, p. 79), and emphasized that his "approach to distance education . . . is based on the very general observation that feelings of personal empathy and personal relations between learner and teacher support motivation for learning and tend to improve the results of learning" (Holmberg, 2007, p. 69).

Wedemeyer was first introduced to Holmberg's work, *On the Methods of Teaching by Correspondence* which had appeared in *Home Study Review*, in 1961 (Wedemeyer 1961a, 1961b). Wedemeyer wrote to Holmberg, expressing interest in his work, and in turn, sent a copy of *New Perspectives in University Correspondence Study* (written by Wedemeyer & Childs, 1961). Wedemeyer toured correspondence schools in Europe that year and met Holmberg during his visit to Sweden in 1961. The two continued a lifelong correspondence, sharing publications such as Hermods' monthly newsletter *Korrespondens* and myriad course materials (Holmberg, 1961a, 1963). In July 1963, Holmberg visited Wedemeyer at his office in Madison, Wisconsin. This led to a deepening of their friendship and professional alliance. In 1964, Holmberg focused on the upcoming Correspondence Education Conference (CEC) which was occuring in Malmö, Sweden, and Wedemeyer was working on the second volume of the *Brandenburg Memorial Essays* (Wedemeyer, 1963, 1966b). Holmberg contributed to this volume of work, and he and Wedemeyer met again in June 1965 at the ICCE conference in Stockholm, where Wedemeyer gave the keynote speech.

Holmberg finished *Correspondence Education* (1967a) two years later and wrote to Wedemeyer about the AIM program (1967b):

> Lots of things are happening here . . . We are giving more and more attention to and spending more money on developing our methods and products and we have certainly learnt a lot from American research and experiences. . . . All over the world people talk about the multi-media project that you are in charge of in Wisconsin. I wonder if you can let me have some rather detailed information on it?

Holmberg told Wedemeyer (1967b) that even though Hermods was experimenting with television, radio, and telephone courses, "this is a mere beginning and I understand you have reached much further."

For the next two decades, Wedemeyer and Holmberg corresponded and worked together in ICCE and CEC. As president of ICCE, Wedemeyer appointed Holmberg "to a key role in

negotiations with UNESCO that led to a strengthening of ties and a raise in ICCE's status, which also raised Holmberg's status and leadership role within ICCE. Holmberg became president of that organization after Wedemeyer's term was over" (Diehl, 2012, p. 43).

Holmberg believed that quality student support based on the importance of "personal relations, study pleasure, and empathy between students and those representing the supporting organization" (Holmberg, 2007, p. 69) should be a primary foundation for successful programs. Wedemeyer's analyses of his consulting work at the University of South Africa (UNISA) and AIM show that both men believed that student support was critical for successful programs. As evidenced by their correspondence and actions, the two influenced one another's theory and practice (Diehl, 2011a).

Guided Didactic Conversation

As noted previously, Holmberg made his mark with the development of "a predictive theory" that applies an instructional methodology grounded in using a teaching-learning conversational style. The idea for this theory was first published in *On the Methods of Teaching by Correspondence* and referred to his theory as "guided didactic conversation" and, later, as "teaching-learning conversations" (Holmberg, 2003, p. 79).

In his book, Holmberg was struck by the notion that many distance education courses consisted of books with self-checking exercises and repeated tasks that were submitted to the distance-teaching organization. He felt that this method of schoolbook teaching could be replaced with a conversation-like style wherein instructors talk *with* students rather than talk *to* students. Holmberg believed that a "friendly atmosphere, helpful suggestions, and encouragement" not only supported motivation but facilitated success (Bernath & Vidal, 2007, p. 432). He concluded that if distance education adopted an empathetic approach, the results of the study would improve.

Guided didactic conversation implies that the presence of empathy and a friendly atmosphere in traditional face-to-face education applies to distance education. Holmberg noted that learners in traditional educational settings read challenging and complicated texts and contended that similar texts could be adopted for distance education learners and include empathy supporting, conversational guides as study supplementation. The rationalization for this idea is the argument that helping and teaching learners is the main purpose of the interaction between instructors and learners. This requires teaching, explaining, and providing examples first and grading as a secondary job.

In a distance education course, the conversation-like interaction is between a learner on one end and the instructor of the organization administering the course on the other end. The constant interaction, "or conversation," is simulated through the learners' interaction with the pre-produced course and media (i.e., written or telephone) interaction with their instructors. The distance education course and the non-contiguous communication are viewed as the instruments of the conversation-like interactions between the learners and instructors.

The approach to the theory is based on seven postulates (Holmberg, 1995, p. 47):

1. That feelings of personal relation between the teaching and learning parties promotes study pleasure and motivation.
2. That such feelings can be fostered by well-developed self-instructional material and two-way communication at a distance.
3. That intellectual pleasure and study motivation are favorable to the attainment of study goal and the use of proper study processes and methods.
4. That the atmosphere, language, and conventions of friendly conversation favor feeling of personal relation according to Postulate 1.
5. That measures given and received in conversational forms are comparatively easily understood and remembered.

6. That the conversation concept can be successfully translated for use by the media available to distance education.
7. That planning and guiding work, whether provided by the teaching organization or the learner, are necessary for organized study, which is characterized by explicit or implicit goal conceptions.

Holmberg is known for his belief that quality student support is a primary basis for successful programs. His theory places the learner and their communication with their instructor at the center of the teaching and learning process. Holmberg noted that a characteristic of good distance education mirrors a guided conversation wherein learning is the objective and is facilitated by the existence of these conversational traits (Holmberg, 1983). Finally, empathy between those who teach and those who learn is universally a good basis for learning.

Recommended publications for further insight into Holmberg's influence and ideas can be found in Bernath and Vidal (2007), Black (2004, 2007), Diehl (2011a, 2011b), and Holmberg (Holmberg, 2003, 2007).

Wedemeyer and Otto Peters

Otto Peters is known for the theory which describes distance education as an industrialized form of education. In the early 1960s, Peters examined correspondence educational systems, and concluded that in a post-industrial society, distance education incorporated teaching as an "objectified process" which includes "professional planning and preparation, formalization, standardization, mechanization, automation, digitalization, rationalization, division of work, mass production, repeatability, and centralization" (Peters, 2007, p. 58). While many researchers have focused on this organizational dimension, Peters (Bernath & Vidal, 2007; Peters, 2007) has stressed that his theory also addresses the historical, economic, cultural, sociological, anthropological, and most significantly, the important and unique pedagogical dimensions of the phenomenon of distance education. According to Peters (Bernath & Vidal, 2007, p. 435), "The change of the very nature of knowledge is a product and consequence of industrialized learning," and the focus of his theory is "on these radical changes, which had never been experienced before."

In 1965, Wedemeyer and Peters met for the first time at the ICCE in Stockholm. Wedemeyer gave the keynote address, *Correspondence Education in the World of Today*. The ICCE conference in 1965 was more international than it had ever been, with over 220 participants from about 30 countries. Peters was the Chief Educational Adviser for the Federal Republic of Germany's Educational Centre in Berlin at this time (ICCE, 1965).

Wedemeyer, like Peters, shared an interest in surveying the world's correspondence institutions. In 1966, Otto Peters (1966a) wrote to Wedemeyer to tell him that "Der Fernunterricht" had been published and that it contained "a description of correspondence instruction in 11 countries" and Peters, working on *Correspondence Instruction in Teacher Training*, sent Wedemeyer an institutional survey to complete. Wedemeyer (1966a) responded with congratulations and told Peters that the publication would "most certainly be a substantial contribution to our knowledge of correspondence education." In the survey that Wedemeyer returned, he provided information about teacher motivations as well as the use of television combined with correspondence study, radio, and small group correspondence methods. Wedemeyer also sent Peters a list of all of the NUEA institutions that offered correspondence to teachers and thus might be helpful to him. Additionally, Wedemeyer enclosed a copy of the *Brandenburg Memorial Essays I* (Wedemeyer, 1963) and a promise for a copy of the upcoming *Brandenburg Memorial Essays II* (Wedemeyer, 1966b). Over the following months, Peters sent requests for additional information, and Wedemeyer arranged to have research materials delivered to him (Diehl, 2011a).

In the autumn of 1966, Otto Peters and three other German educators visited the United States. In Madison, Peters met with Wedemeyer and also with Dr. Ripley Sims (director, Division of

Instruction with USAFI) and with Dr. William Brothers, (assistant director for Developing Correspondence Programs—Innovated Processes).

Following his tour, Peters (1966b) penned *Report about the International Teacher Development Program*, in which he recommended that the United States should develop a single national center for correspondence courses, citing USAFI as a possible model. After returning to Germany, Peters (1967) wrote to Wedemeyer, told him about a new book *Texte Zum Fernstudium* that he was going to publish, and asked him to contribute. Requesting that Wedemeyer write about AIM, Peters stated it was "the best and most advanced development of university correspondence study!" As the publication date neared, Peters (1968) wrote to tell Wedemeyer that he believed Wedemeyer's and collaborator Dr. Bern's contribution would be "the best chapter of the book." Additionally, Peters told Wedemeyer that he had been invited to make a presentation at the upcoming ICCE in Paris, something that Wedemeyer had suggested to then-President Renée Erdos earlier in the year.

Peters also invited Wedemeyer to visit Berlin to participate in a West German conference to present on "The Changing Role of Teachers." Wedemeyer (1967) believed that in the end, "the AIM experiment would shed light on the changes that innovation require" and that:

> these challenges and changes impel a serious educator to undertake innovations, one result of which is a radical shift in the role of the teacher. But this role change is implied in the challenges and changes and must be confronted there before the implementation through innovation. Indeed I think that if the role change is seen only as a result of innovation, innovation and change will be resisted vigorously. The 'revolution' in education is not, then, merely technological, although the technological elements are most visible.

Otto Peters and Theory

Otto Peters made significant contributions to the conceptual development of distance education and theory, and is recognized for the industrial production model. In the industrial model, conceived in the 1960s, Peters examined correspondence educational systems and found distance teaching to be a mass system of education that incorporated teaching as an "objectified process" which includes "professional planning and preparation, formalization, standardization, mechanization, automation, digitalization, rationalization, division of work, mass production, repeatability, and centralization" (Peters, 2007, p. 58).

In demonstrating the characteristics of distance education within the industrial model, Peters (1967) applied terms from business studies into the following categories:

Rationalization: For Peters, rationalization is "methodical measures with the purpose of achieving output with a comparatively lower input of power, time, and money" (Keegan, 2013, p. 110). In relation to education, a rationalized way of thinking is not a new concept as it provides the reasoning for a number of educational decisions. A university professor, for example, will choose subjects that best fulfills the purpose of their lecture.

The Division of Labor: In application, the division of labor means dividing one complete work process into smaller tasks, with each task being performed by one person or a group. The division of labor allows for tasks to be given specialized attention whereby the person or group have the opportunity to find easier methods of attaining an object or goal, thus increasing productivity. In distance education, the complete work process consists of dividing responsibilities among university units that are specialized in a particular area such as course development.

Mechanization: In a work process, mechanization is the use of machines that replace the work done by people. Distance education uses modern means of communication and electronic data processing and cannot take place without the use of technology or machines.

Assembly Line: In a traditional assembly line, workers remain stationary while the items they are working on move past them. In distance education, the manuscript for the distance study course is passed from one area of responsibility to another and specific changes are made at each stage. Study materials are printed on a large scale; stored; disseminated to the learner at a distance, who then completes the materials and sends it to an individual who reviews the work; and finally, sent to the administration. In this instance, time, money, and energy are saved.

Mass Production: Mass production is the manufacturing of large amounts of standardized products using an assembly line or automated technology. Mass production in distance education requires constant research on consumer requirements and, by nature, is only possible where there is a large mass of consumers. To ensure the success of distance education courses, the quality of distance education courses should be continuously evaluated to improve the quality of the course.

Preparatory Work: During this stage, a person or organization determines how workers, machines, and materials can practically relate to each other during the production process. The success of distance education depends on the right type of preparation and concerns the development of courses. In this stage, experts—often with higher qualifications than university instructors—in various specialized fields are consulted, and each section of a course can be carefully planned. In addition, contributions from distance advisers and tutors are essential in the stage.

Planning: An essential element of preparation is planning, and in distance education, this requires a system of decisions and coordination that determines a procedure prior to it being followed through. Specifically, this means that all the necessary measures, from beginning to end, must be introduced according to plan. In the development of a distance education course, planning plays an important role as the contents of each module must be predetermined prior to the start of the course.

Organization: Planning is dependent on the organization of the production cycle. In regards to organizational management, organization is defined as "creating general or permanent arrangements for purpose-orientated activity" (Mayntz, 1963, p, 86, as cited in Peters, 1967). In distance study, organization informs the mechanics of the production cycle. For example, organization makes it possible for learners to receive predetermined course content at designated times.

Scientific Control Methods: These are methods by which work processes are tested and analyzed in accordance with results collected from empirical data. These methods are used to determine the effectiveness of a course not only for an individual learner, but for the whole group of learners.

Formalization: In a manufacturing process, formalization is the predetermination of the phases in a production. In distance education, there is an emphasis on formality as each person or unit relies on the previous work being followed through according to plan. Thus, communication and activities must be predetermined according the agreed rules.

Standardization: Standardization in distance education is finding a standard for distance education courses that adequately addresses a large body of learners. This process involves by developing a model for the course, improving it by involving experts, and testing it on a representative group of students prior to a large group.

Change Function: As a result of the division of labor, the functions for individuals in distance education change and are split into roles with a particular specialization.

Objectification: In distance education, a number of teaching functions are objectified. Objectifying the teaching functions allows the teaching process to be reproduced, making it available at any time. The advantage of objectification in distance education is the benefit of taking place anywhere and at any time and the ability to be continuously improved.

Concentration and Centralization: Peters indicated that "the investment necessary for industrialized mass production involving division of labor has led to large industrial concerns with a concentration of capital, a frequently centralized administration and a market that is not seldom monopolized" (Keegan, 2013, p. 123).

Since the introduction of the industrial model to the field of distance education, many have characterized the theory as an organizational model. Peters, however, indicated that this was not its intention. His purpose was to create an awareness and demonstrate a completely different configuration of education that was disregarded at the time. His theory focuses on the pedagogical issues and changes that had not been seen before in their field. The application of the theory allows educators to understand the reality of teaching and learning from a distance and to imagine the potential developments in the future (Peters & Keegan, 1994).

Wedemeyer and Michael Grahame Moore

Michael Grahame Moore met Wedemeyer in 1970 and worked as his research assistant at the University of Wisconsin in Madison. Moore and Wedemeyer immersed themselves in discussions about independent learning, open and distance education, and learner autonomy, which led to Moore's theory of transactional distance (Diehl, 2011a).

Building upon their work on independent study theory, Moore published "Towards a Theory of Independent Learning and Teaching" (Moore, 1973b), and then expanded some of his ideas about distance education in "Speculations on a Definition of Independent Study" (Moore, 1973a), which was presented at the Conference on Independent Learning in Vancouver, Canada. His article "A Model of Independent Study" was published in the European journal *Epistolodidactica* in 1977. Moore continued to build theory about independent study (Moore, 1980a, 1980b).

Moore (1976) completed work on his doctoral dissertation, *Investigation of the Interaction Between the Cognitive Style of Field Independence and Attitudes to Independent Study Among Adult Learners Who Use Correspondence Independent Study and Self Directed Independent Study*. In this study, he measured learning attitudes, field independence, and examined and measured the "psychological characteristics of correspondence students" in two professional adult education programs. According to Moore (1976, p. 14), the study represented "the first investigation of the field independence cognitive style of students in an adult education program," but also contained the basic ideas about dialogue, structure, and learner autonomy that a few years later were reworked into a theory called transactional distance.

Moore identified three types of interaction in distance education: teacher/learner, learner/learner, and learner/content—and these provided the seminal foundation that influenced the Community of Inquiry framework and the idea of presence in online courses (Diehl & Shattuck, 2015; Garrison, Anderson, & Archer, 2000; Gunawardena & Zittle, 1997). Additionally, Moore's theory of transactional distance has been cited as the significant and perhaps, the only solid theory of distance education (Saba, 2013; Saba, 2014). For a deeper description and analysis of transactional distance theory, see Chapter 3 of this Handbook.

Conclusion

Sixty years ago, Wedemeyer emphasized that there was "a need for a correspondence instruction journal to help workers in the field identify with others in the field as well as to develop and maintain a competency in the field," but at the time, he was "pessimistic that a correspondence instruction journal could be supported in the U.S." (Wedemeyer, 1969). Twenty years after this statement, as the director of The American Center for the Study of Distance Education at Penn State, Moore

launched *The American Journal of Distance Education*, and in the first issue, he interviewed Wedemeyer, whose comments on research still apply today: "without it, we cannot pick up our field, raise its level, and improve its practicality" (Moore, 1986) p. 62).

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3

THE THEORY OF TRANSACTIONAL DISTANCE

Michael Grahame Moore

Previous editions of this *Handbook* have described the theory of transactional distance, reported some of the most recent research based on the theory, and commented on related developments in the field. A similar structure will be adopted here.

The First Theory of Distance Education: A History

Before looking at the theory itself, we should note the historical context in which it first emerged, because regardless of how useful the theory may be for research today, its first importance is that it articulated an idea about teaching and learning that was, in its time, quite revolutionary.[1]

For most readers, now living in a world in which e-learning, online learning, and blended learning are such familiar features of the educational landscape, it is hard to imagine the world of the 1970s and 1980s, when any suggestion that students could possibly learn as well at a distance from their teachers as they could in a classroom was, to the vast majority of educators, a preposterous idea. Some of those same educators, at only a few universities, might have been aware that in some outpost of their campus was a building that administered a team of part-time, adjunct instructors who were engaged in something called correspondence study; this meant sending and receiving lessons through the post. They might even have known there were others attempting to deliver educational programs by broadcasting from radio and television stations operated by the Corporation for Public Broadcasting.

However, so despised and derided by the educational establishment were these forms of teaching, that it would be a very adventurous professor of education in 1970, or even 20 years later, who would deign to mention them when lecturing on teaching methodology or countenance their inclusion in the theories about education that appeared in the textbooks supplied to teachers in training in the college of education. Not surprisingly, this neglect meant that there was no academic research into such out-of-classroom practices, the only research of any kind being data gathered in university Extension departments attempting to evaluate the effectiveness of their correspondence and broadcast programs. Scholarly research, in the sense of research that is driven by theory and that contributes to theory, was impossible, simply because there *was no theory* to start with. All scholarly research in education was grounded in the almost universally accepted assumption as stated by the Association of Supervision and Curriculum Development that "instruction refers to the activity which takes place during schooling and within the classroom setting" (ACSD 1968, p. 123)

It was to establish the identity of the *other* form of teaching and learning, i.e., that which did *not* take place in classrooms, that the term "distance education" was first proposed and later developed into the theory of transactional distance.

The argument for a specific theory of distance education was first made in the following terms, in a presentation to a conference about correspondence education:

> As we continue to develop various non-traditional methods of reaching the growing numbers of people who cannot or will not attend conventional institutions but who choose to learn apart from their teachers, we should divert some of our resources to the macro-factors, i.e. describing and defining the field . . . discriminating between the various components of this field; identifying the critical elements of the various forms of learning and teaching, in short building a theoretical framework which will embrace this whole area of education.
>
> *(Moore, 1973, p. 661)*

Distance education was defined, for the first time, as: "the family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors . . . so that communication between the learner and the teacher must be facilitated by print, electronic, mechanical or other device" (Moore, 1972, p. 76). The "critical elements," which had been identified through empirical analysis of a large selection of program descriptions and (Moore, 1972, 1976) were described as three sets of "macro-factors"—and it was these, it was argued, that should define the field. The first of these macro-factors was derived from analysis of the content of courses, found in study guides and broadcast programs, and was labeled as the program's "structure;" the second, derived from analysis of interactions between teachers and learners was labelled as "dialogue" in the program. The third, based on analysis of the behaviors of students in the programs, described the extent to which they participated in making decisions normally reserved exclusively for teachers, decisions about what to learn, how to learn, and how much to learn, which was labelled as "autonomy."

Origins of the Terms Used in Transactional Distance Theory

The term "distance education" itself originated at the University of Tübingen in Germany, where researchers in the 1960s wrote about "fernstudium" ("distance study") to describe how certain practices common in industry, especially use of technology and *division of labor*, might be applied in teaching. The terms "dialogue," "structure" and "transaction" all originated with University of Wisconsin's professor of adult education Robert Boyd. The term "dialogue" was chosen in preference to "interaction" in response to Boyd's argument that the latter term includes relationships that are manipulative and negative, and that a better term would define the solely constructive exchanges that are essential in a teaching-learning relationship. Boyd's teaching theories were heavily influenced by Gestalt psychology, and it was from this that the importance of identifying programs according to their 'structure' originated. The term "transactional distance" was first used in Boyd's 1980 *Handbook of Adult Education* (Boyd & Apps, 1980, p. 19). Originating with John Dewey, the concept of transaction "connotes the interplay among the environment, the individuals and the patterns of behaviors in a situation" (Boyd & Apps, 1980, p. 5). Thus, the "transaction" in distance education is the interplay of the behaviors of teachers and learners in environments in which they are in separate places and have to communicate through a technology. It is this separation between learners and teachers that necessitates special "patterns of behavior" in how content and teaching are organized in courses and programs—that is their structure—and special "patterns of behavior" in how teachers interact with learners when using communications technologies in the tasks of creating knowledge—that is, through dialogue. In both creating the right structure and determining the appropriate form of

dialogue for any specific student, group of students and subject matter, the aim is to build a bridge across what might be conceived as a psychological distance—a distance or gap in what a student understands about a reality, and the understanding of that same reality by the person or persons charged with helping that student in the development of his or her knowledge. (Here the use of the singular pronoun is unavoidable because the psychological processes of making knowledge is *always* the work of an individual, each person doing so differently to some degree.) It is in addressing the essential and inevitably *personal* character of learning—ignored or down-played in traditional education in which teachers were compelled to treat students as a "class"—that has proven the value, some would say the superiority, of distance education. And this recognition has accelerated, as the rich diversity of modern communication technologies allows for the production of materials and the development of applications that on the one hand benefit many but are also sufficiently flexible to be made relevant to each individual.

The recognition of the key role that students play in managing, to different degrees, their own learning when separate from, or independent from, their teacher, was inspired by Charles Wedemeyer's (1971) definition of "independent study," as well as by the (then) radical writings of Carl Rogers (1969), Abraham Maslow (1968), and other "Humanistic" psychologists.

Thus, to summarize, transactional distance is the gap between the understanding of a teacher (or teaching team) and that of a learner, and distance education is the methodology of structuring courses and managing dialogue between teacher and learner to bridge that gap through communications technology.

More About Structure

Although different teachers might use different terminology, all teaching begins with the planning of a set of activities, traditionally called "lessons," and these may be further organized into a curriculum extending over a period of several days, as in a workshop, or many weeks. Let there be no equivocation on this, however—the fact is that there *must be a plan*. Certainly, learning occurs in the normal course of living, and certainly too, persons may pursue a learning plan of their own without the aid of a teacher or teaching institution. That, however, is not education, which by definition is, as Dewey himself insisted, a transaction between two or more people, both teachers and learners, in which learning is not random but deliberate and planned. The plan normally includes: a statement of the teacher's expectations regarding what the students should learn; a presentation of content that frequently includes information, perhaps a demonstration of skills, sometimes case studies, images, possibly audio and video recordings; activities, projects, and other exercises to help the student engage with and apply the content; advice and guidance about study; and tests to gauge progress or the need for remediation. Although traditionally every teacher constructs all the lesson's components, each component might be the work of a specialist, and the lesson is the product of the team. All activities in the teaching program might be very strictly specified by the lesson's designers, leaving little room for deviation, as is often the case in medical, nursing, military, or other technical training, where a high degree of standardization is appropriate. In high-quality distance education programs, before final determination of the structure of each lesson, it might be tested on a pilot group of students, to find out, for example, precisely how long it will take each student to accomplish each intended learning outcome, or the validity of the activities designed to evaluate performance; they might measure the reading, viewing, or listening skills of the sample of students and then tailor the number of pages of reading, audio or video, research or other activity to be undertaken in each part of the course. Where the course, after design, is to be handed off to more than one instructor (which in better distance education systems is usually the case), to ensure all students achieve the same level of competence, instructors may be given detailed marking and testing schemes. During the phase of dialogue between students and with instructors, synchronous discussions might be

carefully organized, minute by minute, to ensure participation by each student, according to a carefully scripted plan. Instructors might monitor the progress of each student very frequently and give regular feedback and remedial activities for those who need them, and so ensure that every student has accomplished each step of the course in a tightly controlled sequence. Each student might have to follow the exact same sequence of reading and activity; audio and video materials might be tightly scripted and linked to specific pages in an online study guide. There might be ways for students to work at their own pace within the lesson, with some needing more time and others less to reach the teacher's objectives, but the student is not likely to be able to deviate from meeting those objectives according to personal needs or interests.

What has been described here is a course with a *very high degree of structure*. By comparison, other courses that are designed with lesser structure might allow students to articulate their own learning objectives, or find their own paths through the content, or find their own content relevant to the objectives of the lesson or allow them to negotiate other variations with the instructor(s). In such a course with less structure, students might surf the Internet, browse YouTube or a broad set of recommended websites, or view a podcast at their own speed, chosen from a list of recommended readings or find their own, and only submit written assignments when they feel ready. They may be told to contact an instructor if, and only when, they need advice. Such would be a course with *a lower structure* than the one described before. *Since structure expresses the rigidity or flexibility of the course's educational objectives, teaching strategies, and evaluation methods, it describes the extent to which a course can accommodate or be responsive to each learner's individual needs and preferences*.

More is said about this, and the importance given to the student's "autonomy" in the teaching-learning transaction later in this chapter.

More About Dialogue

Dialogue is a particular kind of interpersonal interaction. Interaction is not always constructive, but dialogue, by definition, is. Dialogue is synergistic, as each party in the exchange builds upon comments of the other. In dialogue, "each party . . . is a respectful and active listener; each is a contributor and builds on the contributions of the other party or parties" (Moore, 1993, p. 26).

In *Dialogue in Teaching: Theory and Practice*, Nicholas Burbules (1993) elaborates excellently on the idea and implications of dialogue, although he did not mention distance education: "dialogue involves two or more interlocutors. It is marked by a climate of open participation by any of its partners, who puts forth a series of alternating statements of variable duration (including questions, responses, redirections, and building statements), constituting a sequence that is continuous and developmental." (page 7–8). "Dialogue is an activity directed toward discovery and new understanding, which stands to improve the knowledge, insight or sensitivity of its participants." (page 9).

Courses of instruction may allow almost continuous dialogue between students and teachers—or none, and there is a range of variations between those extremes. The extent and nature of dialogue in a lesson is determined by numerous factors, including such mundane variables as the number of students in the charge of an instructor, but overarching all is the *structure* of the course. For example, a teaching institution that uses synchronous videoconferencing on the Web (a potentially highly dialogic medium) but holding the view that the content of the course demands that the student assimilates very specific information by listening and taking notes, might design highly structured lessons and limit dialogue to asking factual questions of the teacher and receiving answers. A particularly important variable affecting the extent of dialogue is the medium of communication, with the evolution of highly interactive technologies profoundly changing the potential for dialogue in educational programs. We see the limitations of technology on dialogue when we look back at traditional correspondence courses, when each contribution by teacher and student was through the mail. If the same course is delivered on today's Internet even with communication still in text, the technology

allows rapid and frequent responses by teacher to student, and a greater degree of dialogue is made possible. A tutorial between an instructor and a *single* student conducted in real time by Skype or similar audio-video application has the potential of being a highly dialogic process, while a similar online videoconference between *groups* of students would probably have a lower degree of dialogue (for each student). Some courses—such as those using "teach yourself" books, video discs, or Web-based learning—are not only very highly structured but have no dialogue. As will be explained later in this chapter, they are high in transactional distance. Besides the communications technology that link students and teachers, other determinants of the extent of dialogue that is appropriate in any course include the subject of the course, the abilities of students to manage their side of the dialogic process, the personality and interpersonal communication skills of the teacher, and cultural and even language differences between instructors and students.

Managing Transactional Distance Is a Function of Managing Dialogue and Structure

In the history of transactional distance, as described above, following the discovery of structure and dialogue as key "macro-factors," an attempt was made to construct a typology, i.e., to classify the large collection of program descriptions that had been assembled to provide the empirical basis for that discovery. This typology showed programs that ranged from those that were relatively highly structured, based on behaviorist and cognitivist theories of learning, to those—at the other extreme—in which learners engaged in a high degree of dialogue in programs with minimal structure. (It should be noted that the term "relatively" used here is very significant, since transactional distance theory recognizes the fullest range of *all possible* degrees of structure and dialogue.) Because this is a point that is often overlooked, it bears repeating, that transactional distance is *relative*, not *absolute*. Teaching-learning programs are *not* dichotomously either "distance" or "not distance," but they have "more distance" or "less distance."

How transactional distance is determined by the variables of dialogue and structure can be illustrated graphically (Figure 3.1).

More on Learner Autonomy

To include the learner's side of the distance teaching-learning transaction, a third dimension is needed. It was during the analysis of the database of programs that led to the proposition of the two dimensions of transactional distance that this third element emerged. This was the apparent varying ability of students in the programs being analyzed to manage their own learning. Historically, this was a phenomenon previously reported in a landmark series of case studies by Alan Tough in his book *The Adult's Learning Projects* (1971). The same phenomenon was labelled as "learner autonomy" by the psychologist Carl Rogers in his *Freedom to Learn* (1969).

In Moore's (1973, 1976) examination of his sample of programs, it became apparent that the effectiveness of varying degrees of structure or the dialogue in each teaching program appeared to interact with the extent to which learners in those programs were able (or unable) to participate in the design and execution of their own learning programs. In other words, managing transactional distance requires more than deciding the structure of the lesson and skillful management of dialogue in presenting it, but also requires knowledge about the ability of each student to manage his or her engagement with varying degrees of those teaching procedures. A further typology was developed, explained in 1973 as follows:

> In our efforts to explore various aspects of learner autonomy in distance teaching and learning programs, we have tried to prepare a system that makes it possible to order programs

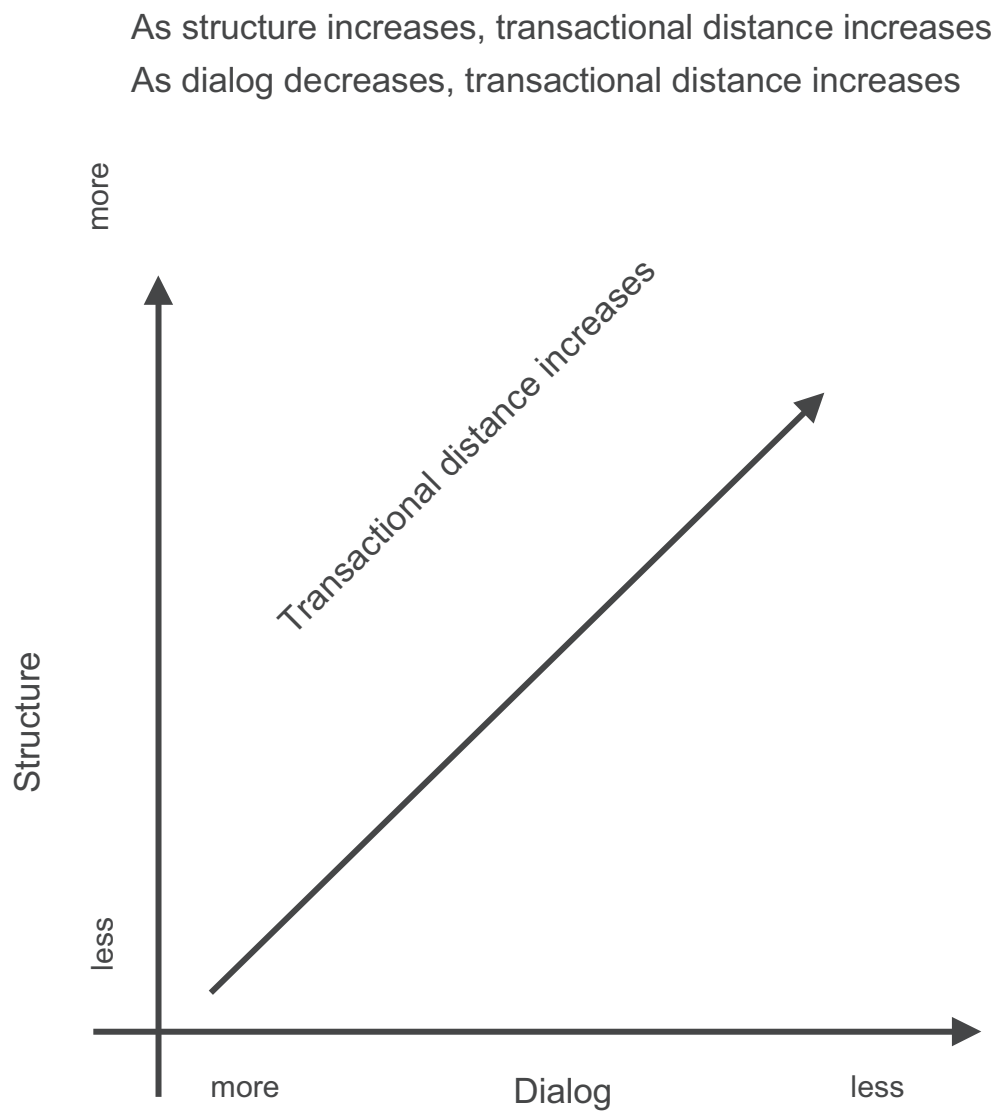


Figure 3.1 Relation of course structure and instructor-student dialogue in transactional distance

> according to the kind and extent of autonomy the learner is expected or permitted—to exercise. We are placing programs in appropriate positions on a continuum, with those permitting the exercise of most autonomy at one extreme and those permitting the least at the other. For every program, we seek to identify the relationship between learners and teachers, and where control of each instructional process lies.
>
> *(Moore, 1973, p. 672)*

Programs were classified on a range labeled AAA that meant the learner had complete autonomy in deciding what to learn (objective setting), how to learn (implementation), and how much to learn (evaluation) at one extreme, and NNN at the other extreme, describing a program in which the learner had absolutely no freedom to make any such decisions (Table 3.1). Because no one is entirely

Table 3.1 Degrees of learner autonomy in determining what to learn, how to learn and evaluating learning

		Objective Setting	*Implementation*	*Evaluation*
A= Learner Determined	1	A	A	A
("Autonomous")	2	A	A	N
	3	A	N	A
	4	A	N	N
N= Teacher Determined	5	N	A	A
("Non-Autonomous")	6	N	N	A
	7	N	A	N
	8	N	N	N

Source: Moore (1973), p. 673

without freedom or absolutely without constraint, these are only theoretical constructs, and in real life all teaching-learning programs lie between these theoretical poles.

In this typology, programs are placed in a hierarchy:

1. Those that give the learner complete autonomy.
2. Those in which only the learner's achievement is judged by an external agent, such as the teacher, college, or an examining authority.
3. Those in which the learner identifies goals and evaluates progress, but the path to achieve goals is controlled.
4. A program type in which learners define their own learning problem and goals but have no control of the implementation and evaluative processes.
5. Programs in which objectives are externally determined, but implementation and evaluation are learner controlled.
6. (Most uncommon), a program in which the student evaluates progress and completion of objectives and procedures determined by the teaching agency.
7. (By far the most common), those programs in which the student has some control over the implementation, but the goals are prescribed by a teacher and evaluation is also by teacher or an external agency.
8. Finally, like AAA, NNN programs cannot exist in reality, since no learner is either entirely free of others' influence or entirely dependent on others.

These are theoretical constructs only, which describe the bounds of reality.

(Moore, 1972, p. 83, slightly modified)

Since this classification has sometimes been misunderstood, it should be noted that it was *not* suggested that all distance learners are fully or even highly autonomous. It is recognized that learners vary in their ability to exercise autonomy, and some might want to have greater autonomy in some courses than in others. Consequently, it is appropriate for educators to allow the exercise of more or less autonomy even within the same course. Indeed, ascertaining the appropriate level of autonomy for the students in a course in general as well as for each individual should be an aspiration in the design and implementation of every course.

Relationship of Learner Autonomy and Transactional Distance

In a course with low structure and high dialogue, i.e., low transactional distance, learners receive information and guidance through frequent ongoing dialogue with their instructors and through

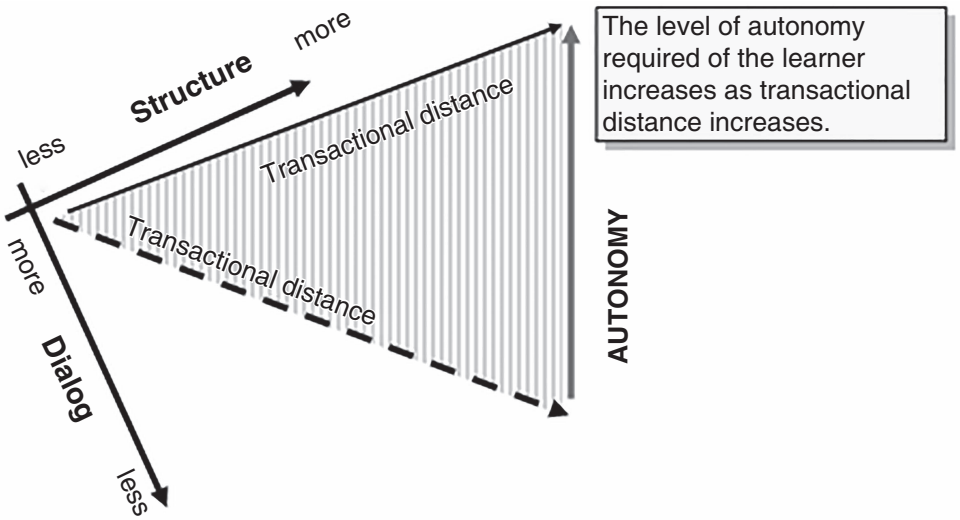


Figure 3.2 Relation of dimensions of transactional distance and learner autonomy

instructional materials that allow modifications to suit their individual needs, learning style, and pace. Such a program, having a lower degree of transactional distance, is likely to be more attractive to those learners who are less confident in managing their own learning. On the other hand, more autonomous learners are more comfortable with less dialogue, receiving instruction through more highly structured course materials, comfortable with finding information and making decisions for themselves about what to study, when, where, what ways, and to what extent. In other words, the greater the transactional distance, the more opportunity (and necessity) for the learners to exercise autonomy.

This relationship is illustrated in Figure 3.2.

Commenting on the significance of this relationship between the three variables, the eminent German pioneer scholar Otto Peters (one of the Tübingen group mentioned earlier) has observed:

> by showing the transactional distance not as a fixed quantity but as a variable, which results from the respective changing interplay between dialogue, the structured nature of the teaching program being presented, and the autonomy of the students, it (the transactional distance theory) provides a convincing explanation of the enormous flexibility of this form of academic teaching. It also provides an insight into the pedagogical complexity of distance education.
>
> *(Peters, 1998, p. 42)*

Recent Trends in Educational Practice: Personalized, Collaborative and Blended Learning

In this revision of the *Handbook* it seems timely to mention—although too briefly—three trends in educational conceptualization that have become fairly well established in contemporary practice since earlier editions of the *Handbook*, each of which suggests new opportunities to link with transactional distance theory.

The first of the three trends is the rediscovery of the idea of learner autonomy, now discussed as "personalized learning." The recent history of this concept is found in several international projects

and publications as well as in the United States. For example, in a 2006 conference in Beijing, China, educators from 14 countries issued a declaration about the importance of personalization, defining the concept as "a means of enabling every student to reach their potentials, to learn how to learn and to share the responsibility for their own education" (International workshop for school principals, 2006).

In Europe, a multi-national project in adult education defined personalized learning as "learning that may be self-directed or may be facilitated by a tutor on a one-to-one basis and/or within a group setting. The learner is seen as the actor of his learning and in this sense, is associated with the decisions of the training organization" (LEADLAB, 2010).

In the United States, describing personalized learning as one of the most significant new trends in education, the New Media Consortium defined it as: "the range of educational programs, learning experiences, instructional approaches, and academic-support strategies intended to address the specific learning needs, interests, aspirations, or cultural backgrounds of individual students" (Johnson, Adams Becker, Estrada, & Freeman, 2015).

According to the United States National Educational Technology Plan, "personalized learning means adjusting the pace (individualization), adjusting the approach (differentiation), and connecting to the learner's interests and experiences. Personalization is broader than just individualization or differentiation in that it affords the learner a degree of choice about what is learned, when it is learned and how it is learned." (OET, 2017).

It can be expected that as technologies now being developed become widely adopted, this trend to personalization will accelerate. In particular, innovations in artificial intelligence (AI) will enable the analysis of information such as the frequency of a student's logging in and posting to discussion boards, and problems with various learning tasks, as well as information about each student's prior experience, performance, strengths and weaknesses, personality characteristics, and any relevant socio-economic circumstances. Recent enthusiasts for artificial intelligence claim that a machine that can run multiple permutations of such variables will be able to suggest a personal program for each student. These could include specifying learning objectives relevant to the competence of each individual, and linking each student to suitable resources, monitoring their learning performance, and providing links to support services as needed by each individual. Some cases recently reported of this kind of activity include a project in India called Mindspark that draws on a bank of the 2 million answers generated every day in response to some 45,000 questions. In Brazil, 415,000 pupils in São Paulo are supported by a system called Geekie, and in the United Kingdom a company called "No more Marking" develops tests based on information gleaned from millions of successful essays (McAfee & Brynjolfsson, 2017).

None of what is cited here was suggested with distance education specifically in mind, nor, of course, is a personalized approach to education restricted to distance education. However, because individualization of instruction has been such a distinguishing feature of distance education since the days of teaching by correspondence and then by computer networks and other teleconferencing technologies, there exists a considerable body of knowledge about how to personalize learning. For researchers in education, theories of distance education such as the theory of transactional distance should be ideally suited to framing good questions for empirical research in this growing area of practice.

A second recent trend to note at this time is the explosion of the faculty's interest in understanding dialogue, this having been driven by the popularity among students of communication through social networking technologies. With about three of every four Americans using social media, today's students have an unprecedented ability as well as resources for interacting with each other, not only in virtual groups, but also one on one. Such interaction can of course be time wasting, but if managed under the care of a knowledgeable teacher, within a well-designed course structure, it has the *potential of becoming dialogic*; that is, to be an asset for each student in the creation of their personal

knowledge. This is the vision pursued by those educators who see distance education not as much as a means of personalized individualized instruction in the correspondence tradition, but rather as a reinvention of the traditional class in the form of a virtual group or "community of practice" (see for example Draper, 2015). It is too widely presumed that students and teachers know intuitively how to make knowledge collectively as well as personally, but this is not the reality, and such a shift—if it is to be efficient—requires training based on research. Students have to learn skills of learning together, and for example learn how to share in the design and implementation of learning experiences that will meet their individual as well as collective learning needs. The overlap between the personalized learning view of teaching of increasingly autonomous learners and the view of the virtual class as a community of practice should be apparent, but also apparent are the opportunities for research into these relationships.

In these changing settings for learning, where success depends increasingly on developing the skills of dialogue, some students whose only experience is in the teacher-dependent classroom will have difficulty in adjusting. For the next generation, however, adjusting will become even more essential, as more schools and colleges adopt the practice of "blended learning." This is the third trend of note, the spread of "blended learning," in which distance education programs are dovetailed into conventional campus-based courses. This trend, sometimes also called "flipped learning," keeps the socially convenient arrangement of fixing teaching on a campus—(we have to ask: where would the children go if not in school, or the young adult go when faced with a shrinking workforce?)—while permitting students to benefit from better teaching and personalized learning using distance education programs, managing their own pace of learning and choosing their preferred technology. When blended with face-to-face class time under the control of a competent teacher, each student also benefits from being trained and mentored as a skillful participant in a community of learners, and also from one-on-one interaction with a teacher in designing and managing their personal learning programs. For a broad examination of the application of transactional distance theory to blended learning, see Swart, Wengrowicz, and Wuensch (2015) and Swart (2017).

Other currently popular topics that further indicate a renewed interest in the individual learner, include a resurgence in competency-based education, often connected to the assessment of prior learning, and practices described as adaptive learning. Especially helpful in these developments is the technology of learning analytics, with large data sources brought to bear in the analysis of the individual student's prior performance, individual strengths, weaknesses and noted difficulties with various learning tasks.

These trends toward engaging with learner autonomy and facilitating dialogue between students, as well as between instructor and students—trends in both in distance education and in the blended classroom—not only challenge learners, but bring many new challenges for teachers, too. One of the most demanding challenges for teachers is to make it possible for the student to benefit from the new freedoms by how lessons and courses are *structured*. The greater the freedom and openness to use of a wide range of resources, even greater than before is the need for, for example, well-constructed learning objectives to guide the selection of learning resources and evaluation tasks. Equally, with greater freedom of choice, most students will depend on good course and lesson *structures* that help in organizing their study time and study activities, and structures that help navigate the infinity of online and other resources. Thus, the challenge for teachers in designing courses, either individually or collectively as members of a course team, is to design environments and experiences for learning that takes advantage of social networks as well as the infinity of online resources by providing the *structure* that allows numerous pathways to common goals, with collaborative tasks that stimulate knowledge sharing, while allowing each student to personalize the experience.

For more about these emerging issues of personalization of learning, study in communities of learning and the blending of distance education with face-to-face classrooms, the reader is pointed to upcoming chapters in this *Handbook*.

The final point to be made here is that each of these trends offers many opportunities for the articulation of researchable questions within the framework of transactional distance.

Transactional Distance Theory at Work in Research: Early Studies

Although the term transactional distance first appeared in print in 1980 (Moore, 1980), the first major researcher to recognize its potential, and subsequently to contribute significantly to the development of transactional distance theory, was Farhad Saba. In pioneering the use of computer simulation in educational research, Saba and colleagues developed a model based on principles of systems dynamics that operationalized dialogue, structure, and autonomy, and tested the hypothesized changes in each of these that resulted from changes in others (Saba, 1988; Saba & Twitchell, 1988). In a subsequent project, Saba and Shearer (1994) used discourse analysis to identify ten categories of teacher-learner transactions and again demonstrated how changes in dialogue, structure, and teacher/learner control effected changes in each of the others. Shearer has further developed his interpretation of the theory (2009), while Saba and Shearer's instrument has been adapted for use by others, as for example by Shinkle (2001) and by Braxton (1999), whose instrument was one of the first of several such attempts to create an instrument to measure transactional distance. Most early research addressed questions about transactional distance in programs that were delivered by audio, video and computer-based teleconferencing. The beginning of the new century saw the beginning of studies that focused on Web-based learning, these including Jung (2006), Chen (2001) Clouse (2001), Dron (2002) and Zhang (2003).

Recent Doctoral Dissertations (2012–2018)

Following the pattern of chapters about transactional distance theory in previous editions of the *Handbook*, what follows in this chapter is a listing of some of the recent doctoral dissertations that feature the theory. Doctoral research is overseen by faculty who are presumed to be knowledgeable about the literature as well as research methodology. It is the literature review that makes the doctoral dissertation an especially valuable resource, as it is the build-up of literature that results in the maturing of the theoretical framework itself as an asset for the next generation of researchers. The following is a selection of recent (2012–2018) dissertations that report research directly based on transactional distance theory. This selection *does not repeat* the studies reported in previous editions of the *Handbook*, and therefore *it is essential* that in order to establish a foundation for a specific research study, the researcher consults those previous editions as well as this one. When undertaking the essential literature research, it is also advisable to look for studies that might not cite TD theory as a primary resource, but nevertheless draw on it as a secondary resource in conjunction with other theories. It is also advisable to seek out, as far as possible, some of the many studies that use the theory without explicitly saying so.

In this most recent selection, the studies were undertaken in various parts of the United States (and none have been identified overseas in the past five years), with data gathered in Texas (Minor, 2014), Louisiana (Purdy, 2016), Pennsylvania (Winters, 2017; O'Brien, 2015), and Florida (Bhargava, 2016). Subjects of research have been students learning in biology (Riggins, 2015), nursing (Koslow, 2015), military courses (Kenyon, 2012), composition and reading (McKelvey, 2016), algebra (Berry, 2017), and Russian (Kostina, 2011). Data were gathered from pre-service teachers (St. Arnauld, 2016), educators in community colleges (Riggins, 2015), and students and faculty in universities (Fullwood, 2015; Paul, 2015; Kung, 2016; Forte, 2015), with a preponderance of studies addressing problems at the virtual high school level (Purdy, 2016; Winters, 2017; Berry, 2017; Lane, 2017; O'Brien, 2015; Bhargava, 2016). This expansion in research in the high school population is a notable development when research inventories are compared with those of a decade ago.

Also reflective of the age is that the technology engaged in all the recent studies delivers programs online, some focusing on learning that uses specific applications, such as video games and Second Life (Atkinson, 2013), asynchronous video (Casteel, 2016), and conference calls (Minor, 2014).

The most common research questions focused on instructional design. Clyde (2016) examined the practices of a sample of high school virtual course designers, while Blue (2015), Wheatley (2016), Barnett (2014) and Congress (2015) all used the Delphi method to gather expert opinions about instructional design strategies. Other instruments used in the various studies included the Structure Component Evaluation Tool (Casteel, 2016), the Distance Education Learning Environment Survey (Fullwood, 2015), and the Individual Development and Educational Assessment (IDEA) survey (Forte, 2015). Lane (2017) developed and tested a 35-item survey instrument, the Blended Learning Assessment Scale of Transactional Distance.

Dependent variables reported in the studies included student achievement (Riggins, 2015; Berry 2017; Kenyon, 2012), attrition and dropout (Winters, 2017; Paul, 2015), satisfaction (Koslow, 2015; Komarnicki, 2014; Fullwood, 2015; Scharf, 2015; Kenyon, 2012), personality traits (Casteel, 2016), retention (Waite, 2016), and motivation and autonomy (Purdy, 2016).

Kinyanjui (2017) found no relationship between ethnicity and transactional distance. Kung (2016) examined cultural aspects of online learning by Chinese students in the United States. Scharf (2015) observed differences in student satisfaction between a traditional classroom venue and a live virtual classroom but noted no differences in performance. Cross (2015) explored methods used to develop collaborative learning communities in online classrooms.

Purdy (2016) concluded that virtual high school students do not value virtual learning communities. Similarly, Nwankwo (2015) showed that what students most value is interaction with course material, followed by interaction with the instructor. Kenyon (2012) also examined the effects of interactivity on learner performance, and satisfaction and found a relationship between interaction and gains in mastery of course content. O'Brien (2015) identified tools and techniques used by "highly-qualified" teachers in their online classrooms and described implications for pre-service teacher education programs.

Conclusion: How to Use This Literature

Transactional distance theory provides a very broad framework that defines the variables in the pedagogy of distance education. It allows the generation of a multitude of hypotheses for research into the interactions between all types and variations of course structures, of the great variability of forms of dialogue between teachers and learners, and the equally wide range and variety of students' propensity to exercise control of the learning process. It is as a framework for such a disciplined scientific approach, building new knowledge on the foundation of the old, as contrasted to the haphazard "wouldn't it be nice to know?" approach that is unfortunately too prevalent in education, that transactional distance theory, like other theory, is most valuable.

This chapter has summarized the genesis of the theory and listed some of the research projects it has spawned recently, which now serve to point the way for future research.

Note

1. In this chapter, the words "teacher" and "instructor" are used synonymously, as are "teaching" and "instruction", and "learners" and "students".

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4
INDEPENDENT LEARNING

Jon Dron

Introduction

This chapter traces the evolution of the concept of "independent study" by juxtaposing it with what it means to study dependently. In the process, I hope to uncover what makes independent learning distinctive, not just in process terms but in the less tangible but critical aspects of motivation and connected concerns such as relatedness and belongingness. I will be exploring the shifting tensions between dependence and independence in intentional learning, coming to recognize them not just as two extremes of a single dimension that can never be found in their pure form, but as different dimensions of the same phenomenon.

What Is Independent Learning?

Michael Grahame Moore (1977, p. 11) provides us with among the most precise and well-recognized definitions of independent study:

> Independent Study is any educational programme in which the learning programme occurs separate in time and place from the teaching programme, and in which the learner has an influence at least equal to the teacher in determining goals, resources, and evaluation decisions.

One of the strengths of Moore's definition is that it treats independence and dependency as points on a continuum, not absolutes. As Candy (1991) observes, one's capacity to be an independent learner varies considerably from one context to the next, with different levels of support and guidance needed depending on subject, level, and so on, so there may often be times within an independent study program during which otherwise independent learners are highly dependent on teacher guidance. The extent to which they are independent, therefore, may depend to large extent on the granularity of scale at which we choose to view the process. As significantly, there are many different ways to be independent as a learner, from time and place to pedagogical process and choice of resources, and many different ways to measure them, some of which we will be exploring as the chapter progresses.

Moore goes on to argue that "deliberate learning can be without teaching, and if indeed a learner can establish objectives and achieve them using no resources or procedures prepared by another, and

if he can evaluate his achievement, a learning programme without teaching will occur" (Moore, 1977, p. 12). While true, the crux of the matter revolves around what we mean by "teaching" and whether it is, empirically, possible to engage in such a program "using no resources or procedures prepared by another." Is a learner who watches a guitar player in order to learn some technique using no resources prepared by another? If that learner applies a method of learning they have been taught previously (repetition through practice, for example, or playing slowly before playing faster), is the learner using their own procedures, or those of someone else? Is a learner guitarist who has been shown how to apply and improve a technique by an in-person teacher, but who practices and refines it on their own, learning independently of the teacher or dependently? Teaching is always a distributed function and, at the very least, individual self-efficacy and, by extension, independence, is a complex and emergent phenomenon dependent on an interplay between self and others, not a purely individual characteristic (Bandura, 1977).

It is also worthwhile to consider what Moore means by "resources or procedures." While it is true that many of the trappings of intentional education relate to repeatable processes and artifacts designed for the purposes of learning, there are also many less tangible ways in which we can be more or less independent, such as the relationships we develop with others that are neither resources nor procedures, especially those that affect our motivation to learn. Equally, there are many choices to be made between different resources and procedures that are themselves neither resources nor procedures, but that can and do have a profound effect on learning outcomes and actions.

Perhaps most profoundly, and in a very real sense, little or none of our thinking or, by extension, our learning, can be considered as truly independent of others. In a telling example, Johnson (2012), for instance, describes the safe landing of a crippled airplane, for which the pilot was rightly lauded for his skill but who modestly acknowledged the role of others in his success, as "a kind of duet between a single human being at the helm of the aircraft and the embedded knowledge of the thousands of human beings that had collaborated over the years to build the Airbus A320's fly-by-wire technology" (Introduction, Section 2, paragraph 11). Our thinking is not just extended but enacted in and through the external world (Clark, 2008). Simply by living as humans in a society of other humans and the artifacts they (and their forebears) have co-created, from language to doorknobs, we participate in a massively interconnected web of cognition in which no one person can ever be seen as truly independent of any other and we are all, in one way or another, teachers of (and taught by) others. Our intelligence is as much embedded in other people and objects around us as in our brains (Gibson, 1977; Norman, 1991; Saloman, 1993; Sutton, Harris, Keil, & Barnier, 2010).

What Is Dependent Learning?

The label of "independent learning" initially emerged to differentiate it from the norm of teacher-led learning, through which a teacher would typically guide not just the general topics studied and methods used, but every second of time spent in a classroom, and often beyond. "Dependent learning" is seldom labeled as such, at least partly because of its apparent ubiquity within our educational systems. However, if we are to understand "independent learning," then we need to understand its inverse and its origins. There follows a fairly lengthy sketch that seeks to explain how dependent learning evolved.

A Rough Sketch of the History of Dependent Learning

Educational systems are not and have never been the only way that intentional learning occurs. We are born with an unslakable thirst to learn. Our need to become competent in our environment is as deep as our need for food or sex. Many scaffolds have evolved to help us slake that thirst, including apprenticeship models embedded in practice and storytelling (from epic sagas and poems to

discussions of the day's hunt) to transmit cultural values and beliefs, personal instruction, imitation of norms and behaviors, knowledge embedded in the environment (from cave paintings to public monuments to street signs), oration in public and private spaces, and much more. Each of these models depends in some way on others, but few put learners in a position of dependence as such. Dependent learning, especially for adult learners who might otherwise be seen as independent, was designed.

The Evolution of University Teaching

Our systems of higher education, as we know them today, were created somewhat independently around the 12th century in Paris and Bologna (Norton, 1909). Though differing in detail, both systems were invented to solve one central problem of how to transfer the knowledge of a few scholars to the many. Though there was probably always a largely tacit assumption that deeper and more expansive individual learning would follow, the systems emerged more as a solution to the need to transmit doctrine, typically of a religious, quasi-religious, or religiously inspired nature, than the need for creative, problem-solving, inquiring thinkers. The intent was to transmit very particular forms of didactic knowledge that were, for the most part, a long way from essential life skills needed to operate in a society.

Expertise was a rare commodity, and books were too expensive, and too reliant on technical reading skills, to cater effectively to large numbers of students. Economics dictated that the most efficient means of knowledge transmission was for one person to speak to many. The exigencies of physics demanded that every participant should be in the same place at the same time to listen, often to readings from a book or its glosses, and so the lecture became the fundamental unit of academic education. The word *lecturer*, today used to describe a teacher, means, literally, one who reads. This entailed a further need for rules and norms regarding the behavior of both students and lecturers during lectures. Lecturers were not just the source of knowledge but also because they had to be heard by all, of necessity therefore guided all activities over the period of the lecture. The limitations of how far voices can carry inevitably meant one person facing many and, thus, occupying a unique social position of power while the class was in progress. Even if they chose to temporarily relinquish that power, it was always theirs to retrieve.

Before long, physical classrooms and lecture theaters were designed to make it possible for a single lecturer to read to as many students as possible, though always constrained by the physical limits of how far a voice can carry. The presence of such purpose-built facilities reinforced the dominance of the method, making the likelihood of its persistence in the face of alternatives—notably the increasing availability of printed books—considerably greater. Modalities other than the lecture, such as tutorials and seminars, remained possible. However, the fact that fewer participants could engage in them meant that such events were relatively expensive and took more effort to arrange, and still the tutor or seminar convener guided and managed the process. Teaching thus came to be seen as a controlling process that took place at fixed times over fixed periods, during which teachers were considered to be in complete control of the process, and during which they were expected to fill every second of the time with learning activities of their own devising, with which learners, like it or not, largely had to comply. Thus, students became dependent learners, albeit that these pioneers typically had similar independence to that of conference-goers today: they were seldom required to attend, would rarely positively suffer from non-attendance, and were mostly free to take what they needed from a lecture, with relatively little of the coercion we see in modern times.

Other aspects of our modern educational systems emerged from this basic situation, each reinforcing the next: for example, the academic term was born because there was no point in teaching when students were away, which tended to be during religious festivals (Easter and Christmas) or during summer months, and so courses of around 10–15 weeks (the time separating such occasions) became the norm, for purely pragmatic rather than pedagogical reasons. The upper limits of class

sizes had later knock-on effects, particularly in determining the economics of different forms of assessment, and the availability of education itself. Trappings of academia that we can easily recognize today, from faculties, to courses, to deans, to timetables, to convocations, to lecture halls, were pragmatic inventions in response the need to coordinate and manage the teaching process.

Once courses were born, with regular syllabi and standardized formats, it was only a matter of time before accreditation resulted: it was an adjacent possibility (Kauffman, 2000) too tempting to ignore. Economics again drove the evolution of assessment. At first, oral defenses (vive voces) that required students to demonstrate their learning to a jury of peers were ubiquitous, but these were very resource-hungry. Though antecedents from China that had been in operation for hundreds of years provided the inspiration, the modern written exam was born the end of the 18th century, in the form of the Cambridge Tripos (McLachlan, 1947), which was initially invented mainly to address the need to graphically represent geometric knowledge. By the end of the 19th century, thanks to its cost effectiveness for rapidly rising student numbers, the written exam had come to dominate higher education, providing the illusion of objectivity at greatly reduced cost. Inevitably, such accreditation came to be of equal or, often, greater importance than the learning it certified. The effects of this infected not just lectures but all other aspects of the educational process, reinforcing the power structures that led to them in the first place and shifting the focus from intrinsic reward to extrinsic compliance across the board, from mandated learning outcomes to regularized curricula.

Though far from perfect, and always the consequence of many compromises, the resulting educational systems, ones that have remained substantially the same to this day, evolved to work fairly well at achieving their knowledge transmission goals for quite some time. If someone is intrinsically motivated to learn (as all scholars traveling to these early universities must have been, for it was very far from easy or cheap to do so), then it is not of overwhelming importance whether the teaching process is particularly effective. Intrinsically motivated students will glean everything they can from their teachers, wringing it from them if they must, even when teaching is poor. We have known for many decades that lectures are a very poor means of teaching, when it is assumed that the content of the lecture is what is to be learned (Bligh, 1998; Greene, 1928; Laurillard, 1993), but for intrinsically motivated learners, they can be good enough. Unfortunately, the systems that have emerged are highly antagonistic to intrinsic motivation.

Intrinsic Motivation in In-Person Dependent Study

Supported by countless studies and experiments, self-determination theory asserts that for intrinsic motivation to emerge, our needs for autonomy, competence, and relatedness must all be supported (Deci & Ryan, 2008). Intrinsically motivated students must feel in control, must feel they are becoming more capable/overcoming meaningful challenges, and what they do must have value to them as social beings.

Lectures tend to support relatedness well, inasmuch as learners will be surrounded by others sharing an interest and validating that interest. Teachers, too, can sometimes be quite inspiring, if only in communicating their own interest in a topic and, if there are at least a few opportunities for one-to-one dialogue, can often help learners to overcome obstacles to achieving competence. However, if you are required to teach the same thing at the same pace to a large group of people, and (crucially) if those people are *required* to attend, then there will usually be some that find it too difficult, and others that find it too dull, thus making support for competence very weak because most people will either already be competent enough (the lecture is too dull), or the lecture will not support them in becoming more competent, or will even make them feel inadequate (the lecture is too confusing). There will also be attendees who do not wish to be there, whether because the timing is wrong for them or they are not sufficiently interested. Once in attendance, their actions will normally be highly constrained and, at best, they will be considerably less empowered than the lecturer. Thus, lectures

are also very poor for supporting autonomy: in fact, by their nature, they actively inhibit learner control. To help counter the demotivating tendencies, rewards and punishments—notably in the form of grades and attendance requirements—were invented. Unfortunately (as countless studies have shown), though such techniques work well enough to achieve compliance, one of the few infallible ways to destroy intrinsic motivation is to replace it with extrinsic motivation, especially in the form of external regulation (Deci, Koestner, & Ryan, 1999; Deci, 1972; Kohn, 1999; Gneezy & Rustichini, 2000; Chao, Dehejia, Mukhopadhyay, & Visaria, 2015; Frey & Jegen, 2000; Ariely, Gneezy, Loewenstein, & Mazar, 2009). More unfortunately, the use of extrinsic motivation extends beyond lectures into virtually every aspect of higher education. External regulation, from rules of attendance, to norms of classroom behavior, to (especially) grades that reward or punish, normally plays a large role in determining attendance at classes, and driving the educational process. Extrinsic motivation also operates at a large scale, across whole courses and programs, because, over time, the qualifications that were initially offered to demonstrate learner competence became the fundamental reason for taking courses, acting as filters without which many occupations and jobs were unattainable. We long ago reached a point where it became far more common for the main purpose of seeking education to be attainment of a qualification, rather than the learning that leads to it. This puts great power in the hands of teachers, further diminishing any sense of autonomy students may retain. Our educational systems have evolved to make learning—perhaps the thing that most powerfully and intrinsically motivates all humans from birth—reliant upon extrinsic motivation. It is in this context that most of our pedagogical theories and methods of teaching have evolved. A significant amount of what modern teachers do today is, implicitly or not, an attempt to overcome this fundamental flaw in system design: much is, implicitly or explicitly, designed to reintroduce the motivation that the systems take away by default. Dependent study is now the norm, not because it is a natural or effective way to learn, but because of the consequences of adapting the technologies of teaching to the constraints of physics, and it has evolved its own very distinct pedagogies to help mitigate its weaknesses.

The Emergence of Independent Study

It is in this ubiquitous pattern of dependence, and of pedagogies designed to overcome its ill effects, that the term "independent study" originally emerged in the 1920s to describe approaches to teaching, primarily in universities and colleges, that placed a greater onus on the learners to guide their own learning (Moore, 1973). The term rose to prominence in the field of distance learning in the 1960s, primarily as an alternative to the already popular term, "correspondence study," intended to distinguish its use in university and college teaching from commercial products offering similar distance learning methods (Pittman, 2003). Significantly, these early independent learners were expected to achieve outcomes similar to those of their dependent peers, following broadly similar processes, in order to receive broadly similar qualifications at the end of it, normally taught by teachers that had initially learned their craft in a context of dependence. Independent study had to fit as a drop-in replacement with the rest of the formal body of institutional education and, in most places where it flowered, it inherited a great many of the forms and patterns of its in-person forebears, from faculties and convocations to courses and curricula, from pedagogical patterns to fixed length durations and limited class sizes and, above all, the system of rewards and punishments needed to motivate in-person students. It is hard to understress the significance of this because, as already noted, that formal body of institutional education had emerged primarily as a solution to a set of physical constraints and their consequences, few of which existed for independent learners. The traditional power structures and pedagogies that had been designed for such a setting were, at the very least, of less intrinsic significance for those working at a distance. Despite this, much distance teaching was designed with the teacher at its center, with power maintained through the use of rewards and punishments, primarily in the form of grades, even including (in more recent years, as the technologies

have evolved to allow it) grades for participation that were seldom if ever used or required for in-person teaching, and that normally assess nothing that is being deliberately taught.

A Change in Emphasis

The use of the term "independent study," as it rose to prominence in the late 1960s, coincided with an increasing trend away from the exchange of paper through the postal system that had been the signature modality of correspondence study since Pittman's earliest correspondence courses, to more diverse approaches to learning and teaching, including uses of telephones, radio, TV and other technologies (Gunawardena & McIsaac, 2004). Importantly, use of the term "independent" therefore also represented a shift in focus from the technology of transmission to the pedagogical consequences, a pattern that was similarly reflected in the more generic and all-embracing terms "distance learning" and "distance education" that were gaining traction at around the same time. The terms were fundamentally concerned with describing the interaction expected between a learner and a teacher. The role of the teacher remained, at least from the point of view of instructional designers, much as it had always been, albeit that—for those early distance institutions that followed Otto Peters' industrial model of distance education (Peters & Keegan, 1994) such as the Open University UK and Athabasca University, Canada—the individual teaching role became considerably more distributed among design teams that created materials for learning (Moore & Kearsley, 1996). Within this framework, Michael Grahame Moore's theory of transactional distance, initially promoted as a theory of independent study, came to be recognized as perhaps the most significant theory in the field of distance learning, for rather than focusing on contingent features of the form, it described the functional relationships between autonomy (independence from a teacher), structure (imposed by a teacher or teaching team), and dialogue (between a learner and a teacher). Because distance was seen not as a measure of time and space, but of a continuum between high structure and high dialogue, the theory implied that greater amounts of one would tend to reduce amounts of the other, and vice-versa, a prediction that was confirmed experimentally and theoretically by Saba and Shearer (1994). Though it received little emphasis at the time, given that Saba and Shearer's work focused on synchronous dialogue and structured video that are both unusually constraining, it is worth noting that, even in these early years, high structure (as perceived by the instructor) only rarely translated into quite such high structure (as perceived by the learner) in many distance-taught courses. The teacher-dictated paths through the learning materials were seldom exactly those taken by the learners, who would skip back and forth, skim chapters, and pick up ideas and knowledge from other sources as they pursued their learning trajectories (Haughey & Muirhead, 2005). In this sense, distance learners were almost always a good deal more independent than their teachers tended to assume in the design of their courses.

Intrinsic Motivation in Distance Learning

Independent study intuitively seems to more naturally allow for autonomy than its in-person counterparts. That said, and although (as we have seen) distance learners innately have greater agency in orchestrating the learning process than their in-person counterparts, it is important to observe that choice is not at all the same thing as control. As Baynton (1992) persuasively argued, as well as autonomous choice, it is essential for learners to have the competence and power to make those choices. Almost by definition, without further support, beginners in a subject may lack the means to effectively exercise their ability to choose. To be in control, therefore, implies at least an occasional need to relinquish choice in order to achieve the desired learning (Dron, 2007). One of the challenges of learning design for distance learners is to provide sufficient scaffolding to enable intelligent choices to be made and, especially, to support needs to go beyond the text when it proves over-challenging or insufficient. However, on the whole, competence support is strong for distance learners. Typical

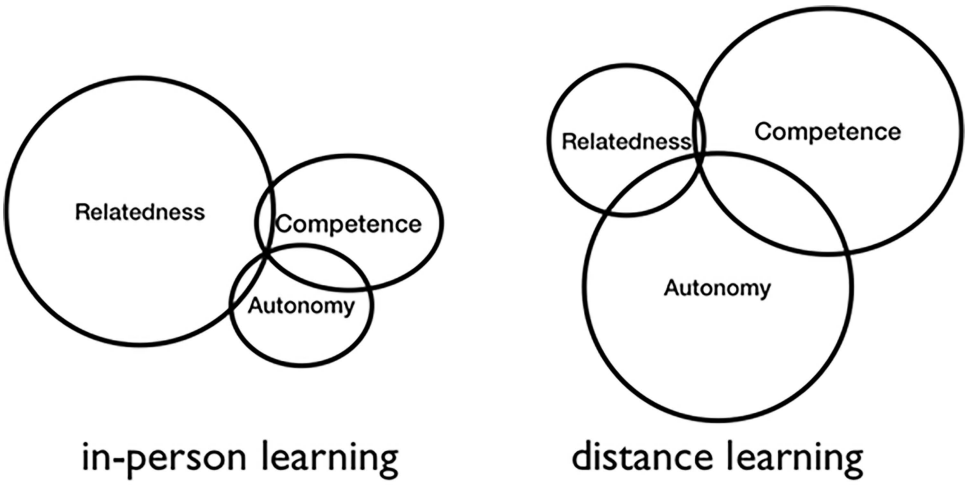


Figure 4.1 Notional degrees of support for intrinsic motivation in typical in-person vs. distance learning

text, video, or audio materials allow learners to learn at their own pace, revisiting areas of complexity and skimming over parts they already know. Self-guided study innately supports independent learners who, in most cases, play a role at least equal to that of their authors in guiding their own learning processes. Relatedness is a different story. By and large, and notwithstanding the benefits of access to individual tutors and other students that is commonplace in many distance education models, or forgetting ways to design materials that allow for at least a semblance of social engagement through guided didactic conversation (Holmberg, 1995), distance learning is often an isolated and isolating activity. Even should it involve others, it seldom does so at the time that learning activities are taking place. While some can find sufficient social support among friends, family, and coworkers, the relative lack of direct engagement with other learners and teachers while learning activities are taking place can diminish or remove one of the necessary pillars of intrinsic motivation. This in turn means that it remains rare for independent learners to feel belongingness, which is often identified as critical to persistence in in-person learning (Booker, 2016; Levett-Jones, Lathlean, Higgins, & McMillan, 2009). Distance learning, in most of its more popular forms, is therefore often the motivational inverse of in-person learning: rich in support for autonomy, typically better in support for competence, but usually weak in support for relatedness (Figure 4.1).

Like its in-person counterpart, the most common solution to a failure to sustain intrinsic motivation in distance teaching has traditionally been reward and punishment, primarily in the form of grades. Indeed, with little of the in-person pressures brought about by social hierarchies and power relationships with teachers in conventional classrooms, such mechanisms have often become the primary drivers of distance education. The consequences, especially in terms of failure to even start, have often been grim. Over the years, distance learning pedagogical models and theories have evolved to help to compensate for these systematic weaknesses. Anderson and Dron (2011) have identified three generations of distance pedagogy—the cognitivist/behaviorist, the social constructivist, and the connectivist generations. Each has distinct ways in which independence is supported and perceived.

First-Generation Distance Learning Pedagogies: Independent Learning

The first distance pedagogy generation was the cognitivist/behaviorist. The focus of these first-generation instructivist pedagogies was on how individual learners were believed to learn. Limited

by the tools of communication widely available—print, postal mail, telephone, audio tape, video tape, television, radio, and so on—this was hardly surprising. Direct communication between learners and teachers was either one-to-many and thus cheap at scale, typically following Otto Peters' industrial model of distance education (Peters & Keegan, 1994), or one-to-one and expensive and/or slow, relying largely on the postal service or telephone. Though blended approaches (including use of in-person tutorials) were very common, notably in the open universities that began to emerge in the 1970s, the emphasis for course designers tended to be on providing highly structured static learning materials. If, as was almost inevitable, materials failed to perfectly meet their needs, learners had little to fall back on but themselves, making independence the default, despite the highly structured learning designs of the courses. The reality was more complex. In the first place, many independent study programs actually provide a significant level of support through tutoring, whether through telephone hours, the postal service, or, in some cases, occasional in-person meetings. Perhaps more importantly, and seldom observed by researchers, learners often have rich support networks of friends and relations who, though seldom offering academic help, nonetheless play an important role in enabling learners to learn through emotional and physical support. It is a gross over-simplification to suggest that "independent" is synonymous with "alone," but it is certainly true that, from the perspective of the teacher, courses were commonly designed based on the assumption that students had little or no support.

Second-Generation Distance Education Pedagogies: Co-Dependent Learning

A large body of literature has long suggested that (at least) higher-order learning is best facilitated in the company of others (Lipman, 1991; Gunawardena & McIsaac, 2004), such as in a community of inquiry (Garrison, Anderson, & Archer, 2000) or community of practice (Wenger, 1998). Indeed, there is a strong body of theory that suggests learning is innately and irrevocably social (Vygotsky, 1978). The emergence of many-to-many communication tools, notably in the form of Internet technologies from the mid-1980s onwards, combined with shifts in attitudes across the educational sector away from the individualistic views of learning embodied in behaviorist and cognitivist-inspired learning theories, led to the second, social-constructivist generation of distance education pedagogies (Anderson & Dron, 2011).

The social constructivist generation was concerned with learners learning together in (typically) small and often conventional educational groups, like classes, cohorts, and tutorial groups, usually employing social constructivist pedagogies that emphasized social presence, and that adopted active approaches to learning such as authentic problem solving and collaborative inquiry. Traditional educational systems had adopted a group membership paradigm (of courses, classes, cohorts, etc.) because it was—in the physical environments of medieval times—the most effective means of making use of scarce resources (Dron, 2016), and so pedagogies to suit were already widely available, and were transcribed as best they could be to the new medium, seldom taking into consideration whether the group—with its roles, leadership, closed membership, schedule, and norms—might be an ideal form in this new virtual space.

Mainly for technical and usability reasons, asynchronous forms of communication, such as Usenet News, mailing lists, online bulletin boards or, as the Web began to emerge, Web-based discussion forums, were far more commonplace than synchronous tools such as MOOs (multi-user dungeons, object-oriented) or video or audio conferences. These asynchronous tools gradually evolved into full-blown virtual learning environments and, later, learning management systems, that largely replicated, and in some cases automated, the functionality of a traditional classroom in asynchronous form, including all the assumptions and trappings that came with it. The asynchronicity was important for independent learners, however, because, although teachers increasingly dictated the pace

of their learning, it still supported a certain amount of flexibility as to when and where students contributed to the discussion: instead of having weeks or months to engage in learning, asynchronous communication reduced control over pace to days or hours, but this was still many times less constraining than for learners in in-person classrooms, where responses are often expected in seconds. Increased pacing typically leads to decreased control. In part this is because it increases the level of imposed structure in the transaction (Garrison & Baynton, 1987), but to a large extent, it is an inevitable consequence of temporal scale: when there is more time to evaluate responses and to explore alternatives, there are more opportunities to explore further pathways and consider more issues. Thus, despite their replication of in-person pedagogies and forms, second generation distance pedagogies significantly diverged.

Perhaps more importantly, as Moore's theory of transactional distance (Moore, 1997) implies, the capability for dialogue opened up the potential for learners themselves to play a larger role in guiding the learning process, and thus being (almost paradoxically, given the significant role of others in the process) more independent learners. However, this independence was a double-edged sword, because every participant in the groups that emerged in this context also played a role in guiding the proceedings. There were very real risks that, especially for the less confident in online forums, a single voice would be lost in the commotion and their agency would be diluted. Rather than being a simple exchange between a teacher and a learner, dialogue in the social constructivist generation of distance learning was between many learners, all engaged in helping one another to learn (in effect, becoming teachers), so the agency of the individual was often submerged in the agencies of multiple others. Worse, group dynamics often reduced the range of possible paths, often leading to groupthink (Janis, 1972) or other ill effects. The direction of everyone's learning trajectory was determined not by one but by all. In this sense, learners were co-dependent on others, as much as they were dependent on teachers who, because they replicated forms of in-person learning, remained very much in control of the overall path that students took, perhaps (thanks to constant intervention and the bizarre but common practice of grading participation) even more than in first-generation pedagogies. Although second-generation pedagogies went some way toward improving the potential for relatedness, and were supportive of competence needs, they tended to do so at the expense of autonomy.

Third-Generation Distance Education Pedagogies: Networked Individualism

Recent years have seen terms like "computer-based training," "computer-aided learning," "computer-assisted instruction," and "e-learning" that focused attention on the technological means of transmission, increasingly replaced by "online learning." The term "on-line" was originally used to describe proximity to railway lines (Trade, 1874). It reflected the fact that people living in communities close to railway tracks had rapid access to the rich resources of a whole country, including people and goods. Those who were off-line led more sedate, but more precarious and less materially prosperous, lives. "Online learning" is similarly less concerned with the technologies than it is with the flow of data and relationships they enable, and the richness of those connections themselves. This shift in emphasis has opened up the potential for theories that treat connection between autonomous agents as the central feature of learning, and that employ a relational definition of independence that cannot easily be extricated from the social network in which each agent plays a part.

The connectivist generation of distance pedagogies includes not only the eponymous theory of connectivism itself (Downes, 2008; Siemens, 2005), but also others such as heutagogy (Hase & Kenyon, 2007), networks of practice (Wenger, Trayner, & de Laat, 2011), transactional control (Dron, 2007), communities of practice (Wenger, 1998), rhizomatic learning (Cormier, 2008), ecological constructivism (Hoven & Palalas, 2011), and many others. Connectivist pedagogies are primarily

concerned with individuals independently learning in networks of other people and the resources they share, rather than in formally constituted groups. Learning is seen as both an inherently social activity, as well as inherently individual but, rather than being concerned with group dynamics, this is about networked individualism (Wellman, 2002) in which learners and their networks co-evolve, and learning spreads organically through the network. Connectivist thinkers recognize the distributed nature of knowledge, and that knowledge may exist in non-human objects and tools, drawing heavily from distributed cognition theory (Pea, 1993; Norman, 1991; Clark, 2008). They acknowledge that part of our thinking is often, if not always, outside our heads, be it in people, artifacts, shared abstractions, or even our own bodies (Clark, 2008), and that there are indistinct lines between self and other in our cognition. They typically draw upon complex systems theory to see both learning and the activities that lead to is as emergent at least as much as planned, and that tacit or unplanned outcomes are often as important as those we explicitly aim for. Most acknowledge and assume the abundance of people and information that is available through the Internet, and consequently that fundamental skills and competences are concerned with traversing the network and discovering help when needed, more than acquisition of personal knowledge. The connectivist generation of pedagogies both celebrates and utilizes the fact that virtually all learning and all teaching is distributed among many actors. Most connectivist pedagogies assume learning to embedded in practice, and not separated from the rest of our lives.

Perhaps most significantly, rather than the *collaborative* social patterns seen in social constructivist approaches, the social modality of networked learners in connectivist models of learning tends to be *cooperative*: this is mostly concerned with independent learners on their own personalized learning journeys, who help one another simply through being connected via a network (usually the Internet), at least as much as through direct collaboration on a shared endeavor. Connectivist models of learning are thus both very focused on the social nature of learning but, equally, on the independent individual at the center of it all. Learners are independent actors who fundamentally rely upon those that they know in order to learn. This brings many freedoms, or ways of being independent.

Cooperative Freedoms

In his hexagon of cooperative freedoms model, Morten Paulsen identifies six distinct dimensions of freedom—or independence—for cooperative learners that have, in the past, been decided by teachers: time, place, pace, content, medium, and access (Paulsen, 1993). Terry Anderson and I (Dron & Anderson, 2014) have modified and extended this model to take account of more recent developments in networking technologies and practices (Figure 4.2). We removed "access" from our list because it only affects learning in its absence. It is a prerequisite to the pedagogical process, but not part of it. To Paulsen's freedoms, Anderson and I added:

- **Technology:** freedom to choose the tools to learn with.
- **Relationship:** freedom to choose who we engage with to learn.
- **Method:** freedom to choose the pedagogical and administrative processes.
- **Disclosure:** freedom to choose the extent to which we share information about ourselves and our values.
- **Delegation:** freedom to delegate control to someone else.

It is possible to be more or less independent in any or of these dimensions and connectivist generation learners are typically able to choose, or negotiate, the level of control with which they are most comfortable in any one of them. Lower levels of freedom correspond to greater levels of teacher control. With that in mind, "delegation" is of particular significance in the context of independent learners because it gets to the heart of how the concept and practice of independence has evolved



Figure 4.2 Cooperative freedoms
Source: after Dron and Anderson (2014)

in the connectivist generation. The modern independent learner can be almost totally independent of formal teachers but, at least to an extent, can call upon myriad teachers, directly or indirectly, as and when needed: modern independent learners delegate control in any of these dimensions when needed, but take it back when it is not. Independence, in this model, is multi-faceted and constantly shifting. For a connectivist-generation learner, it is the norm for there to be high levels of relatedness, competence, and autonomy. However, the extreme flexibility such pedagogies allow comes at a price, and the solutions to the difficulties that emerge are in their infancy.

Wise Crowds and Stupid Mobs

For Web-connected and/or mobile learners, the starting (and sometime ending) point for any learning journey usually begins with Google, Wikipedia, YouTube or some other system driven by massive crowds. In effect, the crowd has become an infinitely varied and capable teacher. Equally, however, it is an infinitely *in*capable teacher. One of the central skills of the modern independent learner is the capacity to traverse networks—of people and their creations—and to make sense of what they find there, but this is a complex skill set to learn. Beyond such well-known sites as Wikipedia, YouTube, and the Khan Academy, a plethora of special interest communities, blog sites, magazine

articles, journal papers, and other resources make the problem of learning not one of scarcity but of over-abundance: it becomes hard to tell the good from the bad, the helpful from the unhelpful, the truthful from the fictional.

The modern independent learner has more control than ever over whether to (temporarily) hand over their control to someone or something else (Dron, 2007). However, as Candy (1991) observes, self-directed learning is not only highly situated—we can be independent in some contexts, but not in others—but dependent on existing knowledge of at least the outline of the subject matter. Until we know what to search for, it can be challenging to find it. The plethora of learning opportunities enabled by the public Internet does not come with a guide book. Crowd-generated tools such as Wikipedia go some way to addressing the problem of sense-making by providing scaffolds from which to build. Wikipedia offers not only accessible overviews of topics but, through links to associated terms, bibliographic references, and definitions, it offers help for a learner to traverse an unknown area by surfing between links. This may, however, not be the ideal way to learn—the ontology of a subject area and links between terms may not afford the most effective way to learn it. Stepping into the gap are myriad individually designed tutorial sites on virtually any topic, from YouTube videos that teach you to play the guitar or fix a broken stopcock, to question-and-answer sites like Quora and StackExchange, to full-blown tutorials on math, programming, or creative writing from sites such as the Khan Academy. Almost all include links to other resources, alternatives, places to go next and, significantly, an ad hoc community around them, from simple comment tools to full-blown threaded discussions. Such communities are usually examples of what Anderson and I (Dron & Anderson 2014) refer to as a "set"—not a network of those who know one another, nor a group with leadership and shared goals, but a collection of people simply gathered together in one place, virtual or otherwise, connected only by shared interests or common attributes.

The biggest problem with sets is that, without binding social ties, they are a breeding ground for trolls, ignorance, filter bubbles (Pariser, 2011), echo chambers (Boyd & Ellison, 2007), and malefactors. To help solve this problem, in many cases, the tools provided for these sets of people go far beyond simple replications of in-person discussions. Many provide rating and ranking systems, both for shared comments and for the individuals making them, that actively make use of collective intelligence—a combination of algorithms or rules (often embedded in software but sometimes applied by individuals in the set) and a crowd of independent, cooperating individuals making informed choices that, in combination, provide guidance and structure to those that follow. Many use artificial intelligence techniques or collaborative filtering (Goldberg, Nichols, Oki, & Terry, 1992) to identify patterns and commonalities within the crowd that will be useful to all. Dron and Anderson (2014) refer to these cyborg entities as "collectives"—active participants in learning formed from the collective actions of many people combined to serve at least some roles—such as filtering, organizing, and judging resources—that are traditionally played by teachers in learning transactions. Few such systems are focused on improved learning—most are more concerned with selling things or matching interests—but there has been active research in making them more effective teachers for at least two decades (e.g., Anderson et al., 2003; Dron, Mitchell, Siviter, & Boyne, 1999; Jian, 2008; Konstan, Miller, & Maltz, 1997; Recker, Walker, & Wiley, 2000).

At first glance, the necessity of having to engage with others, with all the accommodation of the needs of others that it entails, might suggest a potential decrease in independence (or an increase of co-dependence of the sort seen in social constructivist groups), but the opposite is often true. People in networks are always the center of their own network, connected with others through direct or indirect social ties. Though individuals in this network may be of greater or lesser significance in any given case, all matter (Granovetter, 1973) and, to a large extent, the value they provide for learning is orchestrated by the learners themselves. Group-based learning has long been the norm in traditional education, but has seldom been the norm for most learners. From children growing up in families and associated communities of friends, to communities of practice emerging in the workplace, much

of our learning with others has always been in non-formally constituted networks of this kind. Most learning journeys for Internet-connected learners, whether formally taught or not, now begin and often end on the Internet and, of necessity, engage us with countless others who, wittingly or not, help us on our learning journeys. We have all become teachers.

The Effects of the MOOC

Technologies seldom if ever die (Kelly, 2010), and most new technologies either build upon (Arthur, 2009) or retrieve (McLuhan & McLuhan, 1992) some of the forms of those they supersede. Though the connectivist generation of pedagogies is gaining momentum, the older forms of individualized, independent, and group-based learning continue to thrive alongside them. However, their forms are mutating to fit a new reality.

Among the most significant movements in recent distance learning has been the emergence of MOOCs (massive open online courses), many of which appear to retrieve the cognitivist/behaviorist pedagogies of early distance teaching. Siemens (2012) identifies two distinct forms of MOOC, the cMOOC (the first to bear the name, explicitly based on connectivist principles) and the xMOOC (more conventional replicas of classical in-person teaching, usually following what looks at first glance like a first-generation cognitivist/behaviourist pedagogical model focused on helping individuals attain clearly specified goals). Of the two models, the xMOOC has until now been by far the most popular approach, due at least in part to aforementioned benefits of scalability in cognitivist/behaviorist approaches to distance learning and to the prestige of some of the people and institutions involved. Some xMOOCs have engaged hundreds of thousands of independent learners, at costs (to providers) little greater than those of conventional courses. However, though closely resembling first-generation pedagogical designs, significant changes have occurred in the surrounding environment that make the experience of MOOC-takers quite different from that of earlier independent learners. In the first place, they are far more social. Most xMOOCs are accompanied by large-scale discussion forums in which learners seek and give help to one another. The scale matters because, despite relatively sporadic engagement by most individuals, there are often sufficient numbers, in time zones across the world, for the median response time at any hour of the day to be as little as 22 minutes (Severance, 2012). Such communities are normally sets of strangers with common interests, rather than groups of collaborating participants, though some, such as those employing the Stanford spinoff NovoEd (https://novoed.com/) have employed collective methods to form participants into intentional groups. Even without such tools, some larger MOOCs spawn many communities, local and online, of students taking the courses, sometimes involving in-person meetups with the course author or proxies (Severance, 2013). In the second place, cMOOCs largely lack the power structures that underpin traditional in-person teaching. Partly this is because, from reference works to direct access to world-class experts, MOOC learners can go far beyond the MOOC itself. However, the biggest clue that xMOOCs are not simply replicas of older cognitivist/behaviorist courses lies in what, on the face of it, seem appalling retention figures. Though relatively recent trends to both charge and provide credit for xMOOCs have provided the extrinsic motivation needed to increase retention rates to 16% or more (Jordan, 2016), it is notable that most experience attrition rates of greater than 95% (Jordan, 2014), despite the fact that they attract a disproportionate number of highly experienced learners with existing higher qualifications, and that they are often designed with greater care and pedagogical foundation than most in-person courses. There is no more damning indictment of the traditional course format, when freed from extrinsic motivation, than this: without extrinsic motivation, few students find the whole course of significant value. But, like scholars in the early days of universities, they pick and choose parts that are of interest. MOOC takers are in control of their own learning to an extent seldom achieved by in-person learners, making an active choice whether and how to engage with the open and free courses provided. Increasingly, MOOCs

are not bound to academic norms of length or format and, without credit to drive them, they leave the learner in control of all that the learner wishes to control. It is not that the intentional pedagogies are new—they typically replicate conventional teacher-controlled learning designs, including the lectures—but that the surrounding environment—and, in consequence, the orchestration applied by learners themselves—has changed utterly. MOOCs attract sets of independent learners. They seldom form groups of dependent learners.

cMOOCs: Networked Individualism, Massive Scale

The first MOOCs to bear the name were anything but replicas of traditional teacher-controlled courses. Typically, a cMOOC centres around a focal site, organized by a team of "teachers," that provides a schedule, tools for (usually) synchronous events, and a mechanism to aggregate learner-created content from almost anywhere across the Web. Those presenting the scheduled events typically provide background readings, further resources, overviews, and often slides that form the basic materials of the course. However, beyond the scheduled events, which tend to resemble lectures, there are usually none of the other trappings of traditional courses: no assignments, no credentials to be gained, no attendance requirements, no required readings, no fixed learning outcomes, no single person in charge. Inspired by the scheduled events and surrounding resources, individual learners create blog posts or similar content, which are usually linked and aggregated via the focal site so that others can find them, though that may be independent of it. As a result, learners start to form and build networks in which learning is largely mediated by peers, commenting on one another's posts or linking them to their own (often through semi-automated mechanisms like trackbacks and pings). Because networks overlap, ideas, problems, and trends flow through the network, with popular themes reinforced memetically as people comment and post. cMOOCs are thus both social and scalable. The presenters of the events are normally tracking this as best they are able and responding as and when they can. Sometimes they summarize the themes and issues that seem to matter most across the network or provide richer responses to posts that they find interesting or thought-provoking.

Many teachers will recognize elements of the cMOOC process as resembling those of a traditional classroom context. One thing that makes it significantly different is, in the first place, scale—the vast range of ideas that can be shared by thousands of learners is both energizing and overwhelming, and the central problem becomes one of making sense of it all. In the second place, these connectivist MOOCs are massively decentralized and distributed, far beyond the control or even the surveillance of the "teacher." In many cases, the central nodes or current foci of such a network see only a tiny fraction of the teaching that is occurring through cooperative sharing. These are not just independent learners, but also independent teachers. Those providing the foci each week are, primarily, neither sages on the stage, nor guides on the side, but role models, catalysts, and co-travelers. While most cMOOCs have garnered a few hundreds or thousands of participants (bearing in mind that "participant" is hard to define in such courses), a few have continued to grow over time. Most notable, perhaps, is DS106, a digital storytelling course that, like CCK08 (the first MOOC to bear the name), is run both as a conventional university course and as an ever-changing, emergent, highly distributed online event (Levine, 2014). After its eighth year, the course has evolved over time through the participation of tens of thousands of learners which acts as a focal point for a vast and highly distributed array of shared individual work. Central to its success is the fact that work is shared in public, and that it is persistent, breaking two of the central boundaries that limit traditional dependent learning. Others have observed that cMOOCs seldom actually end: the events that catalyzed action in the first place may finish, but the shared content persists, even in the event of the sites that aggregate it vanishing from the Internet. Dave Cormier (2014) has described these as "zombie MOOCs" that, though officially dead, sustain a community around them that can change and grow over time.

Like xMOOCs, almost all cMOOCs experience very high rates of attrition but, given that one of their central motifs is that learners are independent actors, in control of their own learning, this is expected, and is far from being a weakness. It simply means that learners can dip in and take what they need, and they are intrinsically motivated to do whatever they do as independent learners. If that can sustain a set or a network of interested learners then it is good for all, but a learner who is not participating is simply a non-participant, not a dropout or failure. cMOOCs discard most if not all of the trappings of dependent learning that underpin the vast majority of traditional distance as well as in-person teaching.

Retrieving Dependence: New Ways of Controlling Learners

The assumption that teachers control the learning journey remains, at least in our institutions, strong to this day, and some uses of technology have sought to deliberately reinforce that pattern, albeit that teaching behaviors are more often embedded in code than in flesh and blood. The evolving but highly overlapping fields of intelligent tutoring systems, adaptive hypermedia, and, most recently, learning analytics for personalization are mostly concerned with making decisions for learners about their learning journeys, attempting to take away some of the independence that is innate in online learning. However, it is important to note that, in this field, there tend to be two main patterns (Dron, 2007). The first aims to provide learners with the most appropriate content and activities based upon a learner model. Such systems typically selectively reveal and hide content according to rules defined by the system designers. The second pattern is advisory or augmentational: more relevant choices are highlighted, emphasized, or shown at the top of the list, or extra information is provided to help learners make more informed choices, but without hiding any of the alternatives. The advisory pattern is very supportive of independent learners because it does not prevent them from making different choices, but instead provides more information to allow them to make more informed choices about what and how to learn next.

Recent years have seen substantial growth in the field of learning analytics, through which a range of indicators of learning progress are computationally processed to provide help to teachers or learners on their learning journey. From simple indicators of activity through to processing of natural language to discover attitudes and emotional engagement, such systems usually rely upon uncovering patterns in the behavior of many students in order to predict the current and future state of the individual learner. Some offer simple "traffic light" indicators that provide coarse but potentially useful warnings to teachers, while others provide richer graphs and visualizations (Graf, Ives, Rahman, & Ferri, 2011), or, in some cases, start to play similar roles to adaptive hypermedia in guiding learning progress (Wilson & Nichols, 2015). What is common to all is that, in some ways, they move the orchestration of student monitoring from the teacher or student to a machine. In microcosm, this illustrates the central dynamics of control in online learning. On the one hand, the fact that activities normally performed by teachers or students are offloaded onto the machine seemingly implies a reduction in independence: teachers or students effectively delegate their control to a machine. On the other hand, the machine is able to provide information that would otherwise be difficult to obtain, and can help humans in making better decisions. Also, though they entice with their promise of efficiencies in learning, for the most part, analytics tools do not replace what was already possible: though there are risks that a reliance on machines might discourage learners or teachers from delving deeper into the data, in many cases the signals provided by the machines alert their human users of the need for such delving. As is the case with so many educational technologies, learning analytics can (when chosen and used with care) augment our capacity as learners and teachers, as much as it can constrain.

Another retrieval of the dominant-teacher pattern tends to occur in immersive reality applications which are loose simulacra of physical classrooms. The main reasons that such applications offer

a little more independence to learners than physical classrooms are to do with technical weaknesses more than designer intent. Though social presence is strong in environments such as Rumii or Mozilla Hubs, the interfaces still mainly consist of head-mounted displays and data gloves or modified game controllers, which are anything but perfect simulacra of the richness of in-person engagement, and that require participants to be represented as imperfect avatars, without the richness of expression of even video chatrooms. For the most part, it is easy to disengage, or to simulate a different level of engagement than is actually felt, because of the limited visual cues available to signal purpose or feelings. This gives learners a little more agency and control than in a traditional classroom, albeit at the cost of social richness. Uses of such tools nonetheless show a strong tendency to replicate the power relationships of traditional in-person classrooms and, unless new pedagogies are created to make use of their distinctive features, there is a strong chance that they will increasingly reinforce the patterns of control that have proved so problematic in traditional education.

Conclusion

Independence in learning is and has always been a complex, shifting, blurred, and multi-faceted concept, deeply situated in a specific context. There is no such thing as completely independent learning, at least in an educational context, because all learning depends on others, whether now or in the past. On the other hand, and for the same reasons, there is probably no such thing as truly dependent learning because all learners must at the very least orchestrate what they are being taught with what they already know, and all have lives beyond the classroom that are full of learning, reflection, and action. It might perhaps be more fruitful to consider what is meant by *teaching* for independent or dependent learners but, especially in an online and distance context, this too is fraught with complexity, for even in the most structured of taught activities, learners seldom travel precisely the path that teachers intend they should travel.

Letting Go

The most important lesson for the modern teacher, perhaps, is that, in an age of ubiquitous connection, it is essential for online and distance teachers to recognize that they are not and cannot be in control, and that efforts to exercise control, especially in the form of rewards and punishments for compliance, are doomed to mediocrity at best, failure at worst.

Decoupling Grading and Learning

Because the fundamental unit of control in distance and online learning is grading, the first and most important step in recognizing that learner control is to separate learning and accreditation. This is being increasingly institutionalized in the form of competence-based approaches to learning. The approach is best exemplified by Western Governors University (Albrecht, 1999) that has, for around 20 years, provided students with the resources, support, and permission needed for learning but that has deliberately separated the accreditation of learning from the process, enabling learners to achieve the desired outcomes at whatever pace and in whatever manner suits them best, paying a subscription fee rather than per-course one-off payment, and being assessed by achievement of the required learning outcomes rather than course completion. Other universities have increasingly followed suit.

Other approaches to separating learning and accreditation have longer pedigrees. Since first introduced by the University of London in the 19th century, many institutions offer "challenge" exams, whereby students can learn in whatever manner they wish, and simply take exams and/or other assessments to prove equivalent competence to what would normally be achieved in taught courses. Following from that principle, an increasing number of institutions make use of MOOCs, whether

provided by themselves or others, to perform the separation of learning and teaching, providing the teaching (via the MOOC) for free, but charging for the accreditation. Though reinforcing some of the conventional power structures, this opens up opportunities for learners to learn in more expansive, individualized ways, perhaps largely avoiding following the course itself altogether. In a related fashion, many institutions offer processes like PLAR (prior learning assessment and recognition) or APEL (accreditation of prior experience and learning) that allow students to present evidence, often in portfolio form, of independently accomplished learning, including that accomplished through MOOCs. Like the challenge process, these are normally given course equivalence.

Alternatively, students may become partners in planning both the learning journey and its assessment. For example, the University of Brighton, UK, has for nearly 30 years offered an MSc/MA by Learning Objectives, the curriculum for which is negotiated between a learner, the institution and, typically, an employer. It allows the student to specify the learning outcomes, how they will be assessed, and how they will be achieved. Typically, outcomes are achieved through a combination of independent study, on-the-job learning, online and in-person courses, or any number of other methods that suit the topic and learning needs of the student. Such methods, that treat students as partners rather than customers or subjects, are expensive but rewarding for all concerned.

Facets of the Same Phenomenon

There were good, well-grounded reasons that our educational systems evolved to create cultures and pedagogies of dependence, but modern technologies and affordances mean that we can now do things differently, and at scale. The range of choices available to learners to guide their own learning paths, and the resources to support that, are greater now than at any point in history. Traditional institutions and their methods are not going to disappear anytime soon—there is still great value in what they offer, and in the deeply intertwined connections with critical social needs such as accreditation, not to mention that students have learned to learn in a highly dependent fashion in schools, and so they and those that have also gone through the system often demand more of the same—but the trend appears to be increasingly toward supporting independence and diverse paths to success. This is being driven not just by educators but by the rapidly accelerating rate of progress of our societies and technologies, in which learning must and should become a way of life, not an isolated period of early adulthood. The ways that are emerging to achieve that independence, curiously enough, are more social and reliant on others than any traditional teaching methods. As connectivist models of learning mature, we are slowly realizing that independence and dependence on others in learning are not mutually exclusive extremes, but multiple facets of the same phenomenon. We are all dependent learners, and this is precisely what enables us to be independent learners in the first place.

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5

THE COMMUNITY OF INQUIRY THEORETICAL FRAMEWORK

Implications for Distance Education and Beyond

Martha Cleveland-Innes, D. Randy Garrison, and Norman Vaughan

A Theoretical Framework

The Community of Inquiry (CoI) theoretical framework was a direct result of trying to understand developments in online learning and its role in delivering education at a distance. Much of the work associated with online learning during the 1990s focused on and took advantage of the social and democratic features of the technology (Gunawardena, 1991, 1995; Harasim, 1990). Some researchers attempted to broaden the focus to include cognitive elements and focused on the ability of this medium to support higher-order learning (Garrison, 1997; Newman, Johnson, Cochrane, & Webb, 1996). Another key area of research was the role of the moderator as facilitator of the learning process (Fabro & Garrison, 1998; Feenberg, 1989; Gunawardena, 1991; Kaye, 1992). It is these three essential elements (social, cognitive, and teaching) that form the core of the Community of Inquiry theoretical framework.

Online learning and the focus on interaction was a sharp departure from theories of distance education that idealize student independence. It was the early work of Moore and Garrison, among others, who focused on communication (i.e., transactional) dynamics between teacher and student and attempted to clarify the concept of independence. Moore focused on the dimensions of structure, dialogue, and independence. For Moore and others, the central role of dialogue/discourse in this work was seen to be central to the distance education experience. Moreover, the issues of structure and autonomy in Moore's theory have their parallels in terms of the affordances of technology and design/organization in the Community of Inquiry theoretical framework. While the focus here is not to explore these connections, understanding the shift from independence to interaction would be worthwhile to better understand the evolution of distance education and the adoption of the interactive potential of new and emerging information and communication technologies.

The interactive potential of online learning was the driving force for Garrison, Anderson, and Archer (2000) when they constructed the Community of Inquiry theoretical framework. This comprehensive conceptual framework was designed to capture the online educational dynamic and guide the study of online learning effectiveness in higher education. The first assumption was that an educational experience intended to achieve deep and meaningful learning outcomes is best embedded in a collaborative community of inquiry. Lipman (2003) argued for the necessity of a community of inquiry to operationalize critical or reflective thinking as an educational methodology. This assumption was also consistent with the educational philosophy of Dewey (1959), who described education

as the collaborative reconstruction of experience. The context for this study was a collaborative-constructivist learning experience within a community of inquiry. An educational community of inquiry is a group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding. There is both personal independent reflection and shared discourse in a community of inquiry.

The goal of an educational community of inquiry is "to collaboratively engage in discourse and reflection with the intent to construct personal meaning and confirm mutual understanding" (Garrison, 2017, p. 2). The Community of Inquiry (CoI) theoretical framework embraces deep approaches rather than surface approaches to learning and aims to create conditions to encourage collaborative inquiry. The CoI theoretical framework is grounded in specific philosophical and epistemological assumptions and learning theories (Garrison, 2013). In this regard, the CoI theoretical framework represents a process of creating a deep and meaningful (collaborative-constructivist) learning experience through the development of three interdependent elements—social presence, cognitive presence, and teaching presence (Figure 5.1). A sense of being (i.e., presence) is created through interpersonal communication. In order to provide an effective inquiry process and achieve higher-order learning, all three presences must be developed in balance (Akyol & Garrison, 2008).

Before describing each presence, it is important to mention the theoretical development of the CoI theoretical framework. Nearly two decades of CoI research has provided the empirical evidence

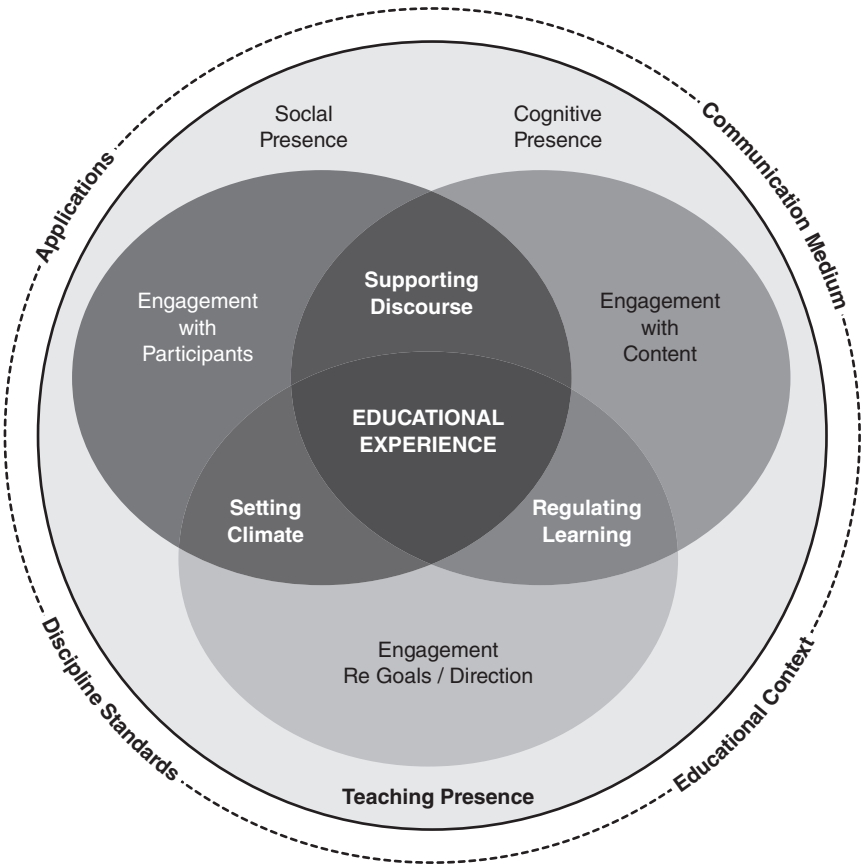


Figure 5.1 The Community of Inquiry theoretical framework

that the CoI theoretical framework represents a coherent set of articulated elements and respective models describing a higher learning experience applicable to wide range of learning environments (from face-to-face to online, from K-12 to higher education) (Garrison, 2017). It also provides the means to generate hypotheses and explore the relationships among the presences while providing the theoretical context to interpret findings. An important tool in this research endeavor is the CoI survey instrument (Arbaugh et al., 2008). This instrument has been widely accepted and translated in a number of languages (Olpak, Yagci, & Basarmak, 2016). These developments verify that the CoI theoretical framework has sufficient coherence and explanatory power to be considered a theory (Garrison, 2017).

Social Presence

Within the Community of Inquiry theoretical framework, social presence was initially defined as the ability of learners to project themselves (i.e., their personal characteristics) socially and emotionally, thereby representing themselves as "real" people, in a community of inquiry (Rourke, Anderson, Garrison, & Archer, 2001). Establishing relationships and a sense of belonging is important. However, the role of social presence in a purposeful learning community is to support critical inquiry and the achievement of educational outcomes. Social presence does not mean supporting engagement for purely social purposes; it means creating a climate that supports and encourages probing questions, skepticism, and expressing and contributing to ideas. As Rogers and Lea (2005) indicate, when individuals identify with the group and the purpose, the group is more productive (as opposed to simply creating interpersonal bonds). In support of this, Jahng, Nielsen, and Chan (2010) found that increased social communications reduced cognitive presence. Subsequently, it has been found that social presence and a sense of community was enhanced by the exchange of ideas and affective expressions did not directly contribute to discourse (Kovanovic, Joksimovic, Gasevic, & Hatala, 2014). Similarly, it has been shown that social interactions are primarily directed for learning purposes (Kozan & Richardson, 2014). Therefore, in order to emphasize the mediating role of social presence for critical discourse, the definition of social presence has been revised to focus on the ability of participants to identify with the group or course of study, communicate purposefully in a trusting environment, and develop personal and affective relationships progressively by way of projecting their individual personalities. This definition suggests that social presence should be developed naturally and progressively through the purposeful and collaborative inquiry process (Garrison, 2017).

Three broad categories of social presence, along with indicators of these categories, were identified and refined by Rourke et al. (2001). The categories of social presence that were derived from this research are affective communication, open communication, and group cohesion. Affective expression using emoticons, capitalization or punctuation, self-disclosure, and use of humor are indicators of the interpersonal communication aspect of social presence. Open communication encourages critical reflection and discourse through a process of recognizing, complimenting, and responding to the questions and contributions of others. Interpersonal and open communications contribute directly to the third category of social presence, group cohesion. Group cohesion is achieved when students identify with the group and perceive themselves as a part of the Community of Inquiry theoretical framework. Cohesive communication begins with activities such as addressing others by name and continues with using inclusive pronouns such as we and our as the next level. Group cohesion increases the capacity for collaboration; the discourse (the sharing of meaning) and the quality of learning will be optimized when there is a cohesive community.

The natural progression or development of these three categories over time raises the issue of the dynamic of social presence. Theoretically, it was predicted that open communication will be high at the beginning and diminish slightly over time while group cohesion and interpersonal indicators will increase. The research of Akyol and Garrison (2008) confirmed this when the data showed a decrease

in open communication and an increase in group cohesion over time. Moreover, it should also be noted that the development and progression of social presence categories may vary depending on the instructional design of the course, the technology used for communication, or the level of teaching presence (Swan & Shih, 2005; Nippard & Murphy, 2007; Shea et al., 2010). For example, Shea et al. (2010) found a rise or fall in student social presence with the rise and fall of instructor teaching presence. This research also confirms the inter-dependency of the CoI elements.

When social presence is established, collaboration and critical discourse is enhanced and sustained. Studies have found a relationship between social presence and learning outcomes (Swan & Shih, 2005; Caspi & Blau, 2008; Liu, Gomez, & Yen, 2009), and social presence and satisfaction (Arbaugh & Benbunan-Fich, 2006; Richardson & Swan, 2003; Akyol, Garrison, & Ozden, 2009). The mediating role of social presence has been confirmed by demonstrating the association with higher academic performance (Joksimovic, Gaševic, Kovanovic, Riecke, & Hatala, 2015; Zhan & Mei, 2013). Moreover, research on the potential relationship between social presence and retention has shown a significant relationship between social presence and retention (Boston et al., 2009). The authors concluded that social interaction remains a crucial factor for retention. Similarly, social presence has also been shown to be associated with motivation and persistence to metacognitively monitor and manage the inquiry process (Malmberg, Järvelä, Järvenoja, & Panadero, 2015).

Cognitive Presence

The second element in the framework is cognitive presence. We define cognitive presence "as the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry" (Garrison, Anderson, & Archer, 2001, p. 4). The concept of cognitive presence is grounded in the critical thinking literature and derived specifically from Dewey's (1933) reflective thinking model. According to Dewey, reflective or critical thinking deepens the meaning of our experiences and is therefore a core educational aim. Critical thinking both authenticates existing knowledge and generates new knowledge, suggesting an intimate connection with education. Critical thinking is integral to inquiry and viewed as an inclusive process of higher-order reflection and discourse. Cognitive presence is operationalized by the Practical Inquiry (PI) model which has its genesis in Dewey's phases of reflective inquiry (Figure 5.2). One key characteristic of this model is the interplay between the public and private worlds, which is particularly relevant to the e-learning experience in an asynchronous and text-based environment. The model has two dimensions that reflect the inductive/deductive and divergent/convergent processes of critical thinking. The vertical axis, the deliberation-action dimension, represents constructive and collaborative activities. It reflects the rigorous process of integrating induction (arrival of generalizations) and deduction (employment of generalizations). The horizontal axis is the perception-conception dimension which reflects the point of fusion of the shared and private worlds. At one extreme is the divergent process of perception and analysis of facts or events; at the other extreme is the convergent process of insights and understanding associated with ideas and concepts.

The Practical Inquiry model is comprised of four phases of critical inquiry which are idealized and, as such, are not sequential or immutable. The four phases are the triggering event, exploration, integration, and resolution. The first phase is the initiation or triggering event associated with conceptualizing a problem or issue. This should be a well-thought-through activity that ensures students' engagement and generates curiosity and questioning. The exploration phase includes understanding the nature of the problem and then searching for the relevant information and possible explanations. At this phase, students iterate between the reflective and shared worlds as ideas are explored collaboratively and individuals try to make sense of complexity and confusion. The third phase, integration, moves into a more focused and structured phase of constructing meaning wherein students are intimately engaged in critical discourse that will shape the understanding. Here participants begin

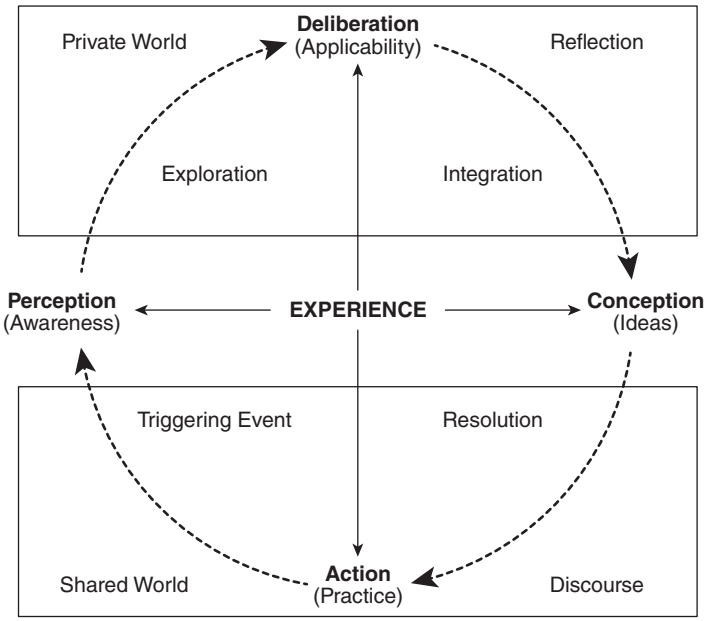


Figure 5.2 Practical Inquiry model

resolving the dilemma or problem at hand by constructing a meaningful framework or discovering a contextually specific solution to a defined problem. The final phase is settling on a solution and vicariously, or in reality, testing the solution through implementation.

Cognitive presence is at the core of a community of inquiry and requires engaging students in all phases of practical inquiry. However, most early studies yielded low level activity on integration and resolution phases (e.g., Garrison et al., 2001; McKlin, Harmon, Evans, & Jone, 2002; Picciano, 2002; Meyer, 2003, 2004; Pawan, Paulus, Yalcin, & Chang, 2003; Vaughan & Garrison, 2005; Kanuka, Rourke, & Laflamme, 2007; Stein et al., 2007). Several possible explanations were suggested. In the review of the CoI theoretical framework by Garrison and Arbaugh (2007), it was argued that inquiry becomes more demanding as it moves to the resolution phase. The inability to move students to the latter phases of inquiry was explained as a function of teaching presence in terms of the design of the task, the need to provide crucial information, and moving the discussion forward in a timely manner. Not surprisingly, therefore, tasks designed to achieve resolution and directed toward that end are more likely to lead to integration and resolution phases (Stein et al., 2007; Alavi & Taghizadeh, 2013). Perhaps taking into consideration these arguments, recent research have yielded greater activity at the integration and resolution phases (Richardson & Ice, 2010; Shea & Bidjerano, 2009; Akyol & Garrison, 2008, 2011). It should also be kept in mind that online discussions seldom provide sufficient time to reach resolution (Richardson & Ice, 2010), and major projects generally reach resolution offline (Akyol & Garrison, 2008; Archer, 2010: Shea et al., 2010).

In order to create cognitive presence and higher-order learning outcomes consistent with intended goals and expectations of the educational experience, there is a need for a moderator (i.e., teaching presence) who can assess the nature of the discourse continuously and proactively shape it following the critical thinking cycle (Garrison & Cleveland-Innes, 2005). Students should be encouraged to relate the ideas and concepts to societal contexts, which increases the likelihood of moving the discourse to integration and resolution phases. Moreover, metacognitive understanding of critical thinking and practical inquiry greatly supports the development of cognitive presence.

That is, when students understand the inquiry process and what is required at each phase, they can exhibit the skills to ensure progression through the phases to resolution. Kuhn (1999) reinforces this point when he argues that "the development of metacognitive understanding is essential to critical thinking because critical thinking by definition involves reflecting on what is known and how that knowledge is justified" (p. 23).

Teaching Presence

We now turn to teaching presence, the third element of the framework. As alluded to previously, teaching presence is crucial for realizing intended learning outcomes. It is the key element in integrating social and cognitive presence during the inquiry process to ensure educational outcomes. Simply stated, teaching presence is what the participants do to create a purposeful and productive community of inquiry. Teaching presence is formally defined "as the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (Anderson, Rourke, Garrison, & Archer, 2001, p. 5). The main responsibilities of teaching presence are identifying relevant societal knowledge, designing experiences that facilitate reflection and discourse, and diagnosing and assessing learning outcomes. Results from this definition and validation work, the functions of teaching presence, are organized into three categories: design and organization, facilitating discourse, and direct instruction.

Design and organization has to do with macro-level structure and process. In an e-learning context, design and organization could be more demanding considering the technology-related issues and the need to redesign approaches to teaching and learning that maximize the capabilities of the e-learning medium. In a collaborative-constructivist learning process, students must have influence in what is studied and how it is approached. Therefore, design should not be separated from delivery. This is best accomplished when both design and organization allows for effective responsiveness to developing needs and events. The second category, facilitating reflection and discourse, recognizes the role of the Community of Inquiry as enabling and encouraging the construction of personal meaning as well as shaping and confirming mutual understanding. Facilitating discourse involves pedagogical, interpersonal and organizational issues. Teaching presence must be as concerned with cognitive development as with a positive learning environment, and it must see content, cognition, and context as integral parts of the whole. The third category, direct instruction, is associated with specific content issues, such as diagnosing misconceptions. The need for direct instruction challenges the "guide on the side" concept. While a guide or facilitator is integral to teaching presence, in and of itself, it is limited as an educational approach to a deep and meaningful educational experience. It suggests an artificial separation of facilitator and content expert and causes the potential distortion of an educational experience due to the exclusion of the influence of a pedagogical and content expert. Teaching presence in an educational context is not possible without the expertise of an experienced and responsible teacher who can identify the ideas and concepts worthy of study, provide the conceptual order, organize learning activities, guide the discourse, offer additional sources of information, diagnose misconceptions, and interject when required.

There is growing evidence supporting the crucial role and impact of teaching presence in an educational community of inquiry (Garrison, 2017; Gallego-Arrufata, Gutiérrez-Santiustea, & Campaña-Jiménezb, 2015). Research has shown that teaching presence is important for perceived learning and satisfaction (Akyol et al., 2009; Richardson & Swan, 2003; Swan & Shih, 2005; Yang, Quadir, Chen, & Miao, 2016), for the acquisition of knowledge (Paechter, Maier, & Macher, 2010), for instructional design (Gasevic, Adesope, Joksimović, & Kovanović, 2015; Joksimovic et al., 2015), for ensuring participation and quality of responses (An, Shin, & Lim, 2009; Bliss & Lawrence, 2009; Gorsky, Caspi, Antonovsky, Blau, & Mansur, 2010; Stein, Wanstreet, Slagle, Trinko, & Lutz, 2013; Wisneski, Ozogul, & Bichelmeyer, 2015), and for the development of the Community

of Inquiry (Brook & Oliver, 2007; Clarke & Bartholomew, 2014; Rienties, Giesbers, Tempelaar, & Lygo-Baker, 2013; Shea, Li, & Pickett, 2006; Ice, Curtis, Phillips, & Wells, 2007). Teaching presence provides the structure (design) and leadership (facilitation and direction) required for effective interaction and discourse leading to higher-order learning. To be an inquirer is to be one's own teacher, to take on regulation (monitoring and management) of one's own learning.

Metacognition

Research into metacognition has shown its importance in regulating the learning experience. This includes the awareness to monitor and ability to manage the learning process and share regulation (Gasevic et al., 2015). Work is currently focusing on validating a metacognitive instrument consistent with the PI model (Garrison & Akyol, 2015a, 2015b). The goal is to provide an understanding of the shared roles and responsibilities associated with collaborative inquiry. This requires an ability to individually and collaboratively regulate the thinking and learning process. Therefore, "there must be a metacognitive awareness of the inquiry process to understand what is required at each phase; then to exhibit the adjustment and flexibility to . . . ensure achievement of intended learning outcomes" (Garrison, 2017, p. 62). To this end, Garrison and Akyol (2015a, 2015b) have developed and begun to verify a shared metacognition construct consisting of two primary dimensions—self- and co-regulation—each of which include monitoring and management functions. A shared metacognition instrument has also been developed and offers a promising means to study metacognition in a community of inquiry.

Now that we have a basic understanding of the Community of Inquiry theoretical framework, we can turn our attention to the implications the CoI theoretical framework has for the study and practice of distance education.

Implications of the Community of Inquiry Theoretical Framework

The CoI theoretical framework has a high adoption rate and has been quite influential in explaining and prescribing the effective conduct of online and blended learning experiences (Vaughan, Cleveland-Innes, & Garrison, 2013; Arbaugh et al., 2008; Swan, 2010; Befus, 2016). The widespread attention to, and application of, the CoI theoretical framework can be attributed to the impact this framework can have on the demands for change in education. First, it provides a new way of thinking about and delivering education that offers more engaging and sustainable learning skills on the part of students. These skills are more aligned with 21st century workplace skills; lifelong, self-regulated yet collaborative learning (Green, Hibbins, Houghton, & Ruutz, 2013). Second, blended and online education requires use of technology beyond the more common automation of activities in everyday life or engagement on social media. This technologically mediated learning opportunity provides deeper experience as a digital citizen; a global environment will not function effectively without such skills (Ungerer, 2012). Third, application of this framework provides a more explicit and active teaching role for faculty, one that provides support and direction for guiding students through an active, engaging learning experience toward deep, meaningful learning (Cleveland-Innes & Gauvreau, 2015; Gehrke & Kezar, 2015).

Recent Research

The Community of Inquiry theoretical framework is commonly used in research by education practitioners, graduate students, and academics studying blended and online learning. A repository of published results can be found at coi.athabascau.ca. Although often for research in higher education contexts, the CoI theoretical framework has shown equal promise for K-12 online and blended

learning (Vaughan, 2016). Expansions of the CoI theoretical framework have been suggested—learning presence (Shea & Bidjerano, 2012), cultural presence (Vladimirschi, 2014), and emotional presence (Cleveland-Innes & Campbell, 2012)—but none have yet been established as permanent revisions to the original framework. A Relationship of Inquiry framework has been suggested to explain a pedagogically sound and inquiry-based model for one-on-one online tutoring (Stenbom, Jansson, & Hulkko, 2016).

Future research will provide further meta-analysis of the expansive research done to date on the framework (Befus, 2016) and provide continued exploration of the role of collaborative thinking and metacognition in the appropriate execution of communities for inquiry-based learning (Garrison, 2016). As a new focus in distance education, collaborative, technologically supported learning bridges distance of many kinds through frameworks like the CoI.

Conclusion

We are now in a post-industrial era of distance education in which contextual and structural constraints are greatly diminished (Garrison, 2009). The emerging Internet and communications technologies have made communities of inquiry possible, allowing students to interact where and when they choose and collaboratively engage in a purposeful and cohesive group environment. As a result, there is a growing awareness and responsibility in terms of applying technology with greater understanding and purpose.

The Community of Inquiry theoretical framework introduced and discussed in this chapter has important theoretical and practical implications for online and blended learning for both distance education and higher education in general. Nearly two decades of research has confirmed that the CoI theoretical framework has enormous potential to design, guide, and assess e-learning approaches, strategies, and techniques—notwithstanding that work remains to validate the dimensionality and the dynamics of the CoI theoretical framework. As a comprehensive guideline, the framework has been a successful catalyst to understand the complexities of online and blended learning (Befus, 2016; Garrison, 2017; Olpak, Yağci, & Başarmak, 2016). The paramount implication is that the CoI theoretical framework has guided the extensive study of how we can use online learning to support and facilitate critical thinking and higher-order learning outcomes. For example, most recently the Community of Inquiry theoretical framework has been used to provide a model of metacognitive awareness and regulation of discourse and reflection online (Garrison & Akyol, 2015a, 2015b). Without such awareness, there is a serious question as to whether researchers will have the means to systematically study the complexities of communities of inquiry and whether students will have the cognitive map to think and learn collaboratively (Garrison, 2016).

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6

GENDER STILL MATTERS IN DISTANCE EDUCATION

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Introduction

Gender still matters in distance education (DE). In the first two editions of the *Handbook of Distance Education*, Kramarae (2003, 2007) argued that gender matters, and we argue that this still holds true a decade later. This is important because the majority of DE learners in higher education are women (Aud et al., 2010; Harvey, Parahoo, & Santally, 2017), and research consistently predicts this as a trend for the future (Lai & Liu, 2009). According to the National Center for Education Statistics (NCES), there was a 178% increase in the enrollment of women in undergraduate degree-granting institutions from 1970 to 2006, an increase from 3.2 million to 8.7 million (Planty et al., 2008 as cited in Lai & Liu, 2009, p. 58). In 2011–2012, a higher percentage of women as compared to men took DE courses at both the undergraduate (35% vs. 29%) and graduate level (39% vs. 32%). Moreover, a higher percentage of women students also took their entire program online (undergraduate: 8% vs. 5%, and graduate: 20% vs. 16%) (Kena et al., 2016). Furthermore, the NCES also predicts that by 2019, women will make up 59% of the undergraduate enrollments (11.2 million) and 61% of the graduate enrollments (2.1 million) (Hussar & Bailey, 2011, pp. 67–68). Although the majority of DE students are women, and technology and the Internet are not gender neutral (Gunn, McSporran, Macleod, & French, 2003; Hanson, Flansburg, & Castano, 2004), there is not much research on the "gendered aspects of online learning" (Patterson, 2012, p. 6) or women's experiences in DE (Weatherly, 2011). In addition, most research on online learning "continually downplays the importance of the gender analysis" (Patterson, 2012, p. 1), even though there are gendered differences in behavior (Gunn et al., 2003; McSporran & Young, 2001), participation and contribution (Caspi, Chajut, & Saporta, 2008; Harvey et al., 2017; Kramarae, 2007), perceived barriers and need for support (Cuadrado-García, Ruiz-Molina, & Montoro-Pons, 2010; Jung & Hong, 2014), and access to (Aneja, 2016; Gokool-Ramdoo, 2006; Jung, 2012) and use of technology (Cuadrado-García et al., 2010; Gunn et al., 2003; Harvey et al., 2017) in online learning. Furthermore, the literature on access and gender equity in DE is contradictory. Scholars claim that the gender technology gap is decreasing and that gender access to technology and the Internet is increasing (Aneja, 2016; Jung, 2012; Patterson, 2012), thus meeting DE's mandate to "democratize access" (Gokool-Ramdoo, 2006) to higher education for those who would not otherwise have been able to participate like nontraditional women students. DE has broadened women's opportunities; however, gender inequities and imbalances remain (Aneja, 2016; Lee, 2017; Patterson, 2012). Gender norms, gender-conforming behaviors, and inequities based on socially constructed differences in gender found in traditional educational settings are

reproduced online. For example, online courses are not designed to meet women's specific needs (Patterson, 2012), nor do they build on women's experiences (Weatherly, 2011). The gender inequities which mirror and are a product of the existing structures and institutions still exist, and even with the emancipatory goal of DE, there has been a failure to address them. This literature review starts with a brief history of women's access to DE, focuses on existing literature on gender and technology in the 21st century, briefly discusses what works and what does not work for women in DE, and concludes with some recommendations on how to address gender inequities and women's needs in DE.

History of Women's Access to Distance Education

Distance education dates back at least to the mid-1800s (Anderson, 2003; Moore, 2013a; Peters, 2003; Pittman, 2003; Verduin & Clark, 1991). During the early stages of DE, the purpose of learning at a distance was regarded by educators as a means to provide educational opportunities to those who were not able to attend face-to-face programs offered by traditional campus-based universities (Diehl, 2013). One of the earliest forms of DE, such as the Society to Encourage Studies at Home, was an educational program designed to specifically help educate women (Agassiz & Eliot, 1971). The program was launched in 1873 by American author and educator, Anna Eliot Ticknor, and over 7,000 women enrolled in that program from various social classes and geographical boundaries (Agassiz & Elliot, 1971; Bergmann, 2001). All DE programs have two things in common: the separation of instructor and learner, and the use of technological media to unite instructor and learner and aid in instruction (Keegan, 1993; Lee, 2017; Moore, 2013a).

The introduction of new technology has forever changed DE and higher education in general (Bozkurt et al., 2015). The more recent forms of DE utilize Internet and Web-based technologies to unite instructor and learner, now commonly referred to as *online education*, are conceptualized based on the sole feature of using the Internet when compared to previous DE media such as textbooks, radio and television (Lee, 2017; Moore, 2013a). Thus, the term DE as a generic name for this type of education has decreased since 2012 with the terms open and distance learning (ODL) and online learning (OL) increasing in frequency as the accepted terminology across a review of related literature. This change in terminology is likely due to the openness movement in Web-based classroom environments (Bozkurt et al., 2015). In this chapter, we will use the terms *distance education* and *online learning* interchangeably. This 21st century paradigm shift meant that DE as a multidisciplinary field is having to react to these changes which also means that the demands of educators and learners will have to evolve alongside these changes (Bozkurt et al., 2015).

While all DE programs have worked to extend learning opportunities to those who are unable to attend the traditional campus, perhaps no DE tool seemed as revolutionary as public access to the Internet. The creation of Internet technologies made DE increasingly accessible, open, and flexible and allowed new forms of pedagogy to emerge (Lee, 2017). This started a revolution in digital knowledge that enabled greater and faster human communication and collaboration, and called for basic changes in education (Harasim, 2000). This shift, making DE seemingly interchangeable with online learning, appeared to be the solution to diverse educational problems of inequality (Allen & Seaman, 2014; Online Learning Task Force, 2011). This is because it was highly anticipated that the use of online courses would enhance the accessibility of higher education since the mandate for DE is to increase access and flexibility (Lee, 2017; Patterson, 2012) and broaden the outreach of higher education (Aneja, 2016) to those learners who could not otherwise be able to participate, like women and other marginalized students. Thus, higher education institutions across the United States have begun to see the need to offer online course options to stay competitive (Bradshaw, 2014). However, the democratizing mandate of DE still has not been realized (Lee, 2017), and gender imbalances and inequities still exist in DE (Gunn et al., 2003) in terms of gender and technology and not meeting student needs.

Gender and Technology in the 21st Century

Accessibility

The literature on gender equity in the online classroom, while plentiful, has been contradictory. While some authors state that gender-specific behavior patterns might deter some women from using e-learning software (Cuadrado-Garcia et al., 2010), others stated that e-learning software uses a flexible and interactive approach, which should have encouraged women to sign up and participate (Shearer, 2003). This sense of division gave rise to concerns about the true equity in online education, particularly for women (Yates, 2001).

A timeline review of the literature sheds some light on these contradictions. Earlier studies, from the 1990s through the early 2000s, focusing on DE accessibility and gender found large gaps in equity in regards to both accessibility and student experiences (Chyung, 2007). Earlier research concerning DE and Internet learning systems (e.g., e-learning software) heavily regarded the Internet as male-dominated when it came to synchronous learning and communication in its infancy because of accessibility. At the turn of the 21st century, however, adult women appeared in the literature as DE's largest demographic because women were constrained by the need to juggle jobs and family commitments, or as some researchers put it, DE made the women's "third shift" possible by offering a flexible education option (Bimber, 2000; Kramarae, 2003; Powell, Conway, & Ross, 1990; Sullivan, 2001). By the early 2000s, many researchers agreed that the gender accessibility gap was decreasing, men and women had equal accessibility to the Internet, and future research should focus on interaction and satisfaction in online learning (Ono & Zavodny, 2003; Price, 2006). However, feminist scholars and others have questioned these claims due to the neoliberal agenda of higher education (Lee, 2017).

Online Communication Behavior

The way men and women use the Internet and communicate online seem to differ (Kramarae, 2003, 2007; Wesserman & Richmond-Abbott, 2005). Women tend to communicate to build rapport or emotional bonds, while men communicate to report or provide answers (Hayes, 2001). This idea can be carried over to computer-mediated communication (CMC) used in DE, as well. As online education and online communication's role in higher education continues to rise, communication between classmates and between instructor and students, is moving online as well via discussion forums, online grading, blog posts, emails, and more (Riordan, Kreuz, & Blair, 2018). The gender differences in online communication behavior in academic, as well as nonacademic, settings seem context dependent, and women tend to exhibit more social behavior online than men do (Cuadrado-García et al., 2010). For example, men tend to post more messages than women students in an online course, but women contribute more 'interactive' social messages than men (Barrett & Lally, 1999). In all-women groups or courses online, women participants wrote significantly more messages than male participants to the rest of the group, but when they engaged in mixed-gender groups, their online behavior changed: women participants wrote less and male participants wrote more than when they were in a mixed-gender group (Bostock & Lizhi, 2005; Kramarae, 2007). Women tend to place more emphasis on interaction in the online environment than men. These learner-learner or student-instructor relationships are very important kinds of interactions in the online environment, particularly to women students. Women students also desire interaction with other students, along with support and orientation for technology, and well-working equipment in their online courses (Patterson, 2012).

Establishing Social Presence Through Interaction

Of the following types of interaction in an online course: learner-learner, learner-instructor, and learner-content (Anderson, 2003; Anderson & Haddad, 2005; Moore & Kearsley, 1996),

learner-content and learner-instructor are significant predictors of student satisfaction in an online course (Kuo & Belland, 2016). It is through these interactions that social presence is developed. While it is something that can come naturally in the traditional classroom where it is easy to see the instructor, online instructors must work to establish a presence (Tichavsky, Hunt, Driscoll, & Jicha, 2015). Garrison, Anderson, and Archer (2001) defined social presence as "the ability of participants . . . to project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'" (p. 89). Teaching presence is more specifically the design and implementation of the course and course facilitation. While the physical separation of instructor and students in online courses may make it more challenging to create social presence, it should not compromise consistent and purposeful communication, and advances in technology can possibly increase communication and the level of both learner-learner communication and interactions (Jones & Shao, 2011).

Learner-instructor interaction is an important area in DE satisfaction, and studies have shown that all students (men and women) regularly perceive their success, in any course, through their interactions and relationships with their instructors (Anderson, 2011; Micari & Pazos, 2012). When moving from the traditional classroom to the online classroom, instructors have a more difficult time making connections with students, showing their personalities, and being emotionally present (Woods & Baker, 2004). This is because students are physically separated from the instructor in an online class. Thus, communication and timely responses from instructors become increasingly important for students. These interactions, along with teacher presence during this physical separation, also affects student perceptions of the online learning environment (Delaney, Jacob, Iedema, Winters, & Barton, 2004). Furthermore, Erdur-Baker (2010) found a statistically significant positive relationship with immediacy and teaching presence such that when an instructor establishes clear patterns of communication, students perceive them as having a teaching presence online. This in turn affects student motivation (Tichavsky et al., 2015). Gender does make a difference concerning learner-instructor interaction as it affects the best mode of social presence an instructor should provide. Women are more likely to seek supportive communication environments (Ryan, Hicks, & Midgley, 1997) and therefore are likely to have significantly different expectations when it comes to frequency and nature of communication and interaction online. Instructors attempting to enhance interaction and build social presence for all students must keep in mind that messages from men engaged in threaded discussions tend to be more certain, confrontational, autonomous, controlling, and abstract than messages from women, which tend to be more empathetic and cooperative (Blum, 1999). Herring (2000) found that women participated more frequently when the instructor actively promoted a civil and focused discourse between all students. In other words, both gender and communication style influenced levels of interaction, immediacy, and social presence building behaviors, and were more consistent with women's online communication than with men's communication (Woods & Baker, 2004).

Instructor support is vital to women learning online (Anderson, 2003; Weatherly, 2011), as it impacts student voice and consequently learning success (Anderson & Haddad, 2005). Anderson and Haddad (2005) found that women experienced greater expression of voice, which led to deeper learning online, than in face-to-face courses—and men did not experience this. Surprisingly, instructor support has more of an effect on women's voices online than course flexibility. This is important, so instructors can focus as much on being present in the course as they do on course design and delivery. This also counters the concerns of instructors that they will become "redundant" in online classes (Anderson & Haddad, 2005, p. 12).

Connectedness, communication, and interaction have always been important issues related to DE (Palloff & Pratt, 1999; White & Weight, 1999). It has been found that women students have reported stronger and more negative responses toward interaction and communication in online classrooms (Sullivan, 2001). While it is difficult to determine if this negative reaction to the online classroom environment is caused by a lack of face-to-face communication or simply pedagogical

style, it appears as though interpersonal interaction is something students, particularly women, will miss in an online environment (Sullivan, 2001).

Because this lack of interaction has always appeared to be DE's shortcoming, many researchers suggest that there should be a greater focus on personal interaction in the online classroom, in order for a course to be successful (Palloff & Pratt, 1999; see also Merisotis & Phipps, 1999; Russell, 1999). McCabe, Sprute, and Underdown (2017) suggest that one way to tear down this digital divide for both genders is through humor. "Hackathorn, Solomon, Blankmeyer, Tennial, and Garczynski (2011) found that students not only expressed favorable comments about their professors who used humor in the classroom; they also showed higher success rates and levels of engagement with their instructors and their peers" (MCabe, et al., 2017, p. 4). Humor can be a valuable tool that can help both genders in the classroom by enhancing course content and increasing interpersonal relationships that women typically value (Hayes, 2001; McCabe et al., 2017; Sullivan, 2001).

Online Environment

One of the biggest indicators of online course satisfaction deals with the online environment and feeling a sense of community (Sullivan, 2001). A sense of community is known as the reaction of students' to feelings of connectedness with their classmates and instructors and commonality of learning expectations and goals. In online courses in particular, a sense of community has been proven to influence students' learning engagement and academic performance; it has also been found that having a low sense of community is one of the top reasons online students drop out or are dissatisfied with the course (Wu, Chen, & Yang, 2017). Wu et al. (2017) conducted a study to see how CMC in online courses affected students' sense of community, and found that there was no correlation between any factor contributing to sense of community and gender; it is important to note that this lack of correlation found concerning gender may be because 84% of their participants were women.

Gender and Online Learning With the Millennial Population

The vast majority of online students today are millennials, which includes people born between 1982 and 2000, and as a result have grown up using technology and have characteristics unique to the digital age (Bagilhole & White, 2013; Howe & Strauss, 2000; Taylor, Parker, Morin, Patten, & Brown, 2014). Generation Z are those students directly following millennials and are projected to be the most diverse generation in the history of the United States. Both millennials and Generation Z have grown up in a post-9/11 world where information is shared and streamed in real time, and civil uprisings are organized via social media (Erwin, 2017). These generations possess characteristics, including characteristics of gender differences, that are unique to growing up in the digital age (Taylor et al., 2014).

This review of the literature has shown that all students have a desire for interaction and collaboration in both learner-instructor and learner-learner relationships, but women have expressed a stronger desire for this communication and relate this aspect of online learning to their overall satisfaction with the course over their male counterparts. However, a recent study by Harvey et al. (2017) suggests that the focus of the differences found concerning student satisfaction and online learning should not be gender as an individual characteristic, but rather age and gender intertwined.

Millennial students have different perceptions and experiences from the generations before them and tend to demand a more interactive and collaborative learning environment, both traditional and online (Cutler, 2014; Renes & Strange, 2011). Since millennial students make up such a large portion of the online higher education population, it is important to examine any gender differences concerning online learning expectations among this population. The three factors that heavily influence millennial student satisfaction with online courses are reputation, physical infrastructure,

and instructor empathy. Reputation here refers to the collective judgments of an organization based on assessments of the financial, social, and environmental impacts attributed to the organization (Vidaver-Cohen, 2007). University reputation was traditionally not identified as a major factor determining student satisfaction in the past (Gibson, 2010), but recent empirical research does support the importance of reputation to universities and its students (Ahmed & Dar, 2015; Harvey et al., 2017). While physical infrastructure does include the physical attributes and aesthetic appeal of a traditional face-to-face campus, it also includes the same qualities of the online environment and the educational software the institution provides, such as a visibly appealing layout. Instructor empathy means that the instructor responds promptly to students' requests and displays genuine caring and a positive attitude toward students. This study suggested the men and women tend to demonstrate similar behaviors as consumers of online education services and did not find a noticeable difference in online satisfaction between the genders (Barone, 2011; Thowfeek & Jaafar, 2012; Tucker, 2014).

Further studies looked at the relationship between overall satisfaction with online learning, reactive behavior patterns, and demographic traits, including gender, among millennial students. The vast majority of millennial students, both men and women, are satisfied overall with their online learning experience, which is consistent with previous studies (Gunn et al., 2003), based on flexibility and the fast pace of the courses, but women millennial students were significantly more satisfied with the online learning experience based on strong learner-instructor interactions, course design, and the learning themes established by the instructor, whereas men focused more heavily on course content (Yonekura, 2006).

What Is Working?

Distance education seems to work for women transcending gendered differences in online learning. Women are not only more satisfied with online learning experiences, studies report women: (a) performing better online (Gunn et al., 2003, p. 14); (b) experiencing more voice and greater levels of perceived deep learning online (Anderson & Haddad, 2005, p. 3; Weatherly, 2011, p. 5); (c) having a greater sense of control over their learning online (Anderson & Haddad, 2005); (d) feeling that the online learning experience is more aligned to their educational values and goals (Weatherly, 2011, p. 5); and (e) overcoming barriers to education attainment through online learning. This list is not exhaustive, but provides a good picture of the advantages of online learning for women.

Some researchers have found that women perform better than men in e-learning (Gunn et al., 2003) and that "e-learning favors women" (Cuadrado-García et al., 2010, p. 370). Gunn et al. (2003) report from their summary of international studies on e-learning that there are gendered differences in behavior and participation, specifically in levels of confidence in working with technology and interaction styles in the online environment. Men report feeling more confident about working with technology, while women report a lack of confidence. Men talk more, ask fewer questions, and interact less socially than women online—an interaction style that is called a more dominant style by some researchers in the United States (Gunn et al., 2003, p. 26)—and researchers posit that these patterns of interactions could be due to men's perceived confidence in the online environment. These gendered differences were not disadvantages for the women students as they performed better than the men in terms of overall course grades. Men did get better grades on the technical aspects of the course (Gunn et al., 2003, p. 22). As Gunn et al. (2003) put it:

> the assumption that difference implies disadvantage is challenged by evidence that variable factors such as professed confidence and apparently dominant interaction styles do not necessarily lead to better educational opportunity and performance. . . . The conclusion is that women often perform better than men despite the observable differences in interaction style.
>
> *(p. 14)*

Cuadrado-García et al. (2010) also found that women students, unlike their male counterparts, did not need help with online software and had no problems using online technology. They concluded that "e-learning, through its flexible and interactive learning approach, favors particularly women" (Cuadrado-García et al., 2010, p. 370).

As mentioned earlier, several studies have found that women students experience more voice, deeper learning, and more satisfaction online (Caspi et al., 2008; Lai & Liu, 2009; Weatherly, 2011) vs. face-to-face courses. Women having voice in online courses, the increased comfort in expressing their voice, and the feeling that they are being heard and valued, have contributed to their perception of deeper learning online (Weatherly, 2011), as the online forum can provide opportunities for participation for students who might not be comfortable in a face-to-face setting. Moreover, even though technology and the Internet are raced, classed, and gendered, the online environment can be intentionally set up so students can challenge these systems of oppression instead of conforming to or reproducing them. Some women also found the online environment to provide a "safer discourse space" and "some voiced appreciation of the anonymity, freedom from prejudice, and less threatening environment they sensed in their online programs" (Weatherly, 2011, p. 6). Men did not perceive these significant differences in voice or learning perhaps because as some researchers suggested the face-to-face environment is not as oppressive to them. Women as well as men also experience a greater sense of control over their learning online which was "associated with higher perceived deep learning" (Anderson & Haddad, 2005, p. 12).

According to Weatherly (2011), women found online learning a socially richer experience and more effective educationally. Women felt more connected in the online environment and felt "that the online learning experience is more aligned to their educational values and goals" (Weatherly, 2011, p. 5).

As mentioned earlier, DE's mandate to provide educational opportunities to those who were excluded and could not participate in traditional face-to-face educational settings has really benefited women. Women face a myriad of barriers to educational attainment, such as family responsibilities, geographical distance from campus, domestic work, health issues, shyness, etc. (Kramarae, 2003, 2007; Weatherly, 2011), and DE helps women overcome those barriers so they can achieve their educational goals. Weatherly (2011) states that the "women I spoke to were able to overcome barriers through online learning, and, in so doing, recognized changes that occurred in their lives" (p. 6).

One of the biggest draws of DE for women is that it accommodates their need to study from home, the domestic sphere, as opposed to the traditional face-to-face classroom, the public sphere. However, feminists like Aneja (2016) caution us that we cannot confine women and their "knowledge acquisition" (p. 853) solely to DE, thus perpetuating and reinforcing gender stereotypes associated with women's roles at home as wives and mothers, and relegating women to the domestic sphere (Aneja, 2016, p. 853). As Patterson (2012) and Aneja (2016) argue, DE should be looked as a "temporary fix rather than the solution to women's educational challenges and struggles" (Patterson, 2012, p. 12).

What Is Not Working?

The main feminist critiques of DE fall into two categories: women's needs, and gender and technology. Most online courses are currently not designed for women, even though more women participate in DE, find online courses more enjoyable (Lai & Liu, 2009), and learn more deeply online. As Patterson (2012) emphasizes, an "overarching concern for distance educators is the lack of attention paid to the specific needs of female students, particularly in the form of institutional and familial support" (p. 8). She also focused on attending to the following student needs to support women in DE: gendered difference in communication needs, women students' need for instructor access and support, and women's time management in online courses (pp. 9–10). We will focus

on time management here, since we have discussed the other two needs previously. According to Patterson (2012), time management is a particular challenge for women as they juggle several roles while studying—an average of six roles, according to Kramarae (2007) and Patterson (2012). Besides, women still have the primary responsibility for domestic work so this gives men more flexibility to do their studying. It is a struggle for women to find time to work on coursework. Gunn et al. (2003) found that "Most males reported mainly working between the hours of 4–8pm while the majority of women studied later in the evening, fitting study around other commitments such as family" (p. 22). Moreover, research also found that women did not have a specified place or time to study at home, unlike men, nor did they have "priority access" to the computer at home even though they were online students (Gunn et al., 2003, p. 22). Additionally, Moss (2004, as cited in Patterson, 2012) found that "Women's 'personal space and time for higher education has to be carved from space and time for other things and from space and time that is often in the control of other people'" (p. 10).

The lack of attention paid to women in DE contributes to the perception that technology and cyberspace are gender neutral in online learning even when scholars like Hanson et al. (2004) and Gunn et al. (2003) have found that not to be the case.

> Once male and female students are more or less equal in terms of access, experience shows that gender based social relationships, interaction styles and inequities that exist in traditional learning situations correspond fairly closely to those found in CSL [computer supported learning] environments. . . . These evidence-based assumptions contradict more optimistic claims that technology is gender neutral and so provides a democratic and equal environment.
>
> *(Gunn et al., 2003, p. 20)*

DE is gendered and does gender in all aspects, from course communications to course design. Hanson et al. (2004) found behaviors and interactions from traditional face-to-face courses replicated online. For example, men were competitive and talked and posted more on mixed-gender courses using assertive mannerisms similar to their dominating behaviors in face-to face settings. Women, on the other hand, were more relational, cooperative, and connected, once again demonstrating similar face-to-face behaviors online. This is not to essentialize gendered behaviors and interactions, but to recognize and acknowledge that DE is gendered, raced, and classed, since gender, race, and class are intertwined. Patterson (2012) argues that failure to recognize and acknowledge or ignore that technology and cyberspace are not gender, race, or class neutral "simply mask problems of difference" (p. 8). This has been relevant in the past and will be in the future, but holds particular significance now in our current time in history with the #MeToo and Time's Up movements to ensure that "past sexist practices, which have been a problem on most campuses, are not perpetuated online" (Kramarae, 2003, p. 261). These gendered differences need to be accounted for in course design, delivery, and support, and this might address the needs of women online, decrease the transactional distance inherent in education (Moore, 2013b), and promote student success.

Recommendations

Gender inequity still exists in DE, even with expanding access and broadened outreach to increasing numbers of women participating in online learning. This is why feminist scholars make a strong argument to take a critical look at DE, technology, and cyberspace to make them more equitable and emancipatory, especially for women. First, we have to acknowledge that socially constructed gender roles and norms shape behaviors and interactions online, and that these gendered behaviors and interactions many times are replicating normative and face-to-face classroom behaviors. Next,

we need to identify women's specific needs and concerns and address them in all aspects of DE, from course conceptualization, design, and delivery to supports. So, how do we do that?

Feminist scholars, and others who have problematized gender in DE and brought up issues of gender disparities, have also offered recommendations for redress. These are the areas that we will focus on here that will help distance educators to accommodate and help women thrive in online learning: contextualizing women's learning, providing different levels and types of supports (Gunn et al., 2003, p. 27), and instructor support.

Gunn et al. (2003) contend that "issues of gender should not be treated in isolation from other factors such as learning styles, educational backgrounds and capabilities" (p. 27). In other words, the contexts of women's lives matter (Patterson, 2012, p. 10). Since learning cannot be separated from the social, cultural, and economic contexts of women's lives, their experiences, as well as their gender differences, should be taken into account when "designing online courses and support systems" (Jung, 2012, p. 12). Moreover, we also need to be cognizant of the "levels and types of support" made available to both genders (Gunn et al., 2003, p. 27). Jung (2012) suggests including "social and psychological support" as part of a support system that can help women with "issues of managing role conflicts and allocating focused time periods to accomplish learning tasks" (p. 12). In addition, Gunn et al. (2003) recommend providing resources and support for students without them asking for it (p. 27). This is particularly applicable to men, since research suggests that they are "less likely" to ask for help and "participate in all course activities" than women (Gunn et al., 2003, p. 27).

Strong instructor presence and effective moderation of online discussion forums by the instructor can help address these issues. Instructors can accomplish this by being aware of the gender differences that are present in the classroom and taking them into consideration when establishing their social and teaching presence online (Tichavsky et al., 2015). A supportive social presence can be established through interactions including instructor-lecture, the instructor-tone, and verbal emphasis on certain content signifying to students what material they should pay special attention to when studying for exams. These are things that can come naturally in the traditional classroom via tone of voice and are things that could transfer over to online lecture delivered where verbal tones could still be used (such as video or audio recordings of lectures) (Tichavsky et al., 2015). There are other ways to achieve a strong social presence in the online classroom. This can include something as simple and asynchronous as emoticons. When emoticons are used in assignment feedback, the instructor was perceived as being significantly more extroverted, agreeable, and open to experience, including by women students (Grieve, Moffitt, & Padgett, 2018). Another way to provide the strong social presence, learner-learner, and learner-instructor communication and interactions that women students want is by offering more synchronous learning opportunities such as video or phone conferencing, or virtual or face-to-face office hours. This can help create the rapport-based communication that women students typically desire by allowing and encouraging those involved to discuss the content of the course and more (Hrastinski, 2008). These strategies can mitigate the transactional distance between instructor and learner, feelings of social isolation that some students experience in DE (Kramarae, 2003), and the perception that DE only enables "limited contact [with] and direction from teachers" (Luk, 1998 as cited in Anderson & Haddad, 2005, p. 12).

Furthermore, giving students control of their learning by asking them to lead online discussions increases course participation and gives students voice, strengthening learner-instructor and learner-learner relationships. A powerful strategy to develop student voice and create an inclusive online classroom is to include "diversity within the curriculum and within the student body" (Patterson, 2012, p. 9). The instructor must intentionally bring issues of diversity and equity into the classroom by including readings, assignments, and other course materials not only reflecting the different identities, experiences, perspectives in the classroom but those that are not.

However, scholars like Kramarae (2003) and Patterson (2012) also advocate looking beyond micro-level supports to the macro level and providing supports such as "affordable and accessible

daycare" (Patterson, 2012, p. 10) for all students, which will increase their educational access. This will expand women's options for higher education beyond home and DE, the private sphere to the traditional brick-and-mortar campus, the public sphere, or a combination of both (Patterson, 2012, p. 10), and not constrain them just to DE.

DE is gendered. Women are outnumbering men in DE, but the specific needs of the women students are not being taken into account. A significant step to center women and their needs in DE is by treating women as subjects who have knowledge and experience and can shape their own learning instead of as passive participants in their education (Weatherly, 2011).

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7

THE STATE OF RESEARCH ON DISTANCE, ONLINE, AND BLENDED LEARNING

Meta-Analyses and Qualitative Systematic Reviews

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In this chapter, we will examine the results of research on distance education (DE), online learning (OL), and blended learning (BL) within the paradigms of quantitative and qualitative methodology as they have come to be synthesized through systematic reviews and meta-analyses over the last 15–20 years. Systematic review (Cooper, 2016) is a generic term that encompasses both quantitative and qualitative methodologies that are appropriately targeted, inclusive, transparent, reproducible, methodologically sound, and rigorously interpreted (Bethel & Bernard, 2010). Systematic reviews can culminate in either a quantitative (i.e., meta-analysis) or qualitative synthesis (sometimes called a meta-synthesis). Both have limitations, and both can convey a sense of the "big picture" as it relates to the questions being asked and answered. Much has been written about both of these methodologies, actually considerably more about meta-analysis, and both have been examined for their potential to overcome methodological flaws that would render them biased and/or inaccurate assessments of the DE/OL/BL literatures (e.g., Bernard, Borokhovski, & Tamim, 2014; Bethel & Bernard, 2010). Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2011) developed a guide for assessing the methodological quality of meta-analyses, and a more advanced version is under development. We will not linger here on these questions of quality, although the methodological quality of systematic review is an important issue, clearly deserving a special discussion. Instead we will lay out what has been done and what the results likely say (and don't say) about the state of the art of designing and implementing DE/OL/BL to affect/improve/support learning.

Quantitative and Qualitative Research

Quantitative Research Syntheses

In the history of experimental research in DE/OL/BL, there has been a tendency for primary researchers to focus on experimental comparisons with classroom instruction (CI), arguably DE/

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OL's most logical and more pervasive alternative (Note: BL is a special case because it contains elements of both CI and DE/OL). During much of that history of DE, until recently, it has never been seriously argued that DE/OL was a replacement for CI. It was characterized as a mode of instruction for a variety of student populations, such as those who needed more flexibility or chose not to attend classes in person, did not have access to face-to-face instruction (e.g., rural learners), and those who for one reason or another could not attend classes on campuses (e.g., stay-at-home mothers, students with disabilities). As such, DE was not expected to be better than CI, but essentially just equivalent to it in terms of major learning achievement outcomes. This notion of equivalence was formalized by Simonson (1999), who argued that "Equivalency theory provides a framework for the design and production of instructional experience for local and distant learners that need not be the same. The key will be whether equivalent experiences produce equivalent outcomes" (p. 5). Actually, it is arguable that whenever two courses are compared, one CI and the other DE or OL, equivalency is all that can ever be expected since, by definition, they can never be the same. So equivalency for Simonson means developing different instructional formats (i.e., CI, DE, OL) that produce similar instructional outcomes related to content learning, skills acquisition, etc.

Simonson's work is interesting because it provides a counterargument to those who have claimed (e.g., Bernard et al., 2004; Clark, 2000) that experimental comparisons between DE and CI are problematic because of the many differences in the two patterns (i.e., threats to internal validity) beyond the comparison in question, so that attribution of "cause due to the distance" cannot be unambiguously established. Simonson's equivalency theory, then, makes sense within local contexts, but less sense when researchers attempt to synthesize many contexts to answer the overall equivalence question, except to the extent that analysts accept the fact that the "treatment" (i.e., DE or OL) and "control" (i.e., CI) can never be the same, only equivalent. In addition, a problem with this approach is, of course, that research cannot test the null hypothesis of no difference (i.e., equivalence), just the alternative hypothesis that states that there is a difference. It could be argued, however, that the fact that many meta-analyses return the same result over a significant time span is suggestive that the null hypothesis of equivalence is true, just not proven. Later in this analysis we will examine this question and the surrounding research evidence.

Qualitative Research Synthesis

Qualitative research in DE/OL/BL has generally not attempted to address the equivalency question, partly because there is no metric of comparison, as there is in quantitative research for judging course effectiveness and because qualitative primary research tends to examine processes, opinions, attitudes, and tendencies rather than the products or outcomes of experiments. Generally speaking, qualitative syntheses fall into roughly the same categories as the primary qualitative studies that populate them. Five common synthesis methods (Bethel & Bernard, 2010) follow:

- **Meta-Synthesis:** This is a catch-all term that can be used to refer to any of the more specific qualitative synthesis methodologies. Sometimes the term *meta-analysis* is used, inaccurately, to replace the term meta-synthesis, although it often includes quantitative studies.
- **Case Survey Review:** Intended as a method for synthesizing large numbers of case study reports, this method is analogous to survey research in that a survey methodology (i.e., a set of predetermined questions) is applied to each of the reports and the survey data analyzed.
- **Theme-Based Synthesis:** Reviewers identify recurrent themes in the primary literature and summarize findings according to thematic headings. Thematic analysis shares common methods with content analysis, narrative reviews, and grounded theory (Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005).

- **Realist Synthesis:** Seeks to explore and understand the theories that drive interventions and to test how well those theories work in given contexts and for whom (Pawson, Greenhalgh, Harvey, & Walshe, 2005).
- **Meta-Ethnography Synthesis:** Is most effective when the component studies are methodologically similar and thus could also be applied to quantitative primary studies. It is best applied to questions of reaction to and acceptance of interventions (Noblit & Hare, 1988).

Research Questions Asked and Answered by Meta-Analysis

Case for Equivalence of Instructional Formats

Table 7.1 summarizes the meta-analyses (and one vote-count study) that have been conducted since 2000. Every quantitative synthesis—DE, OL, and BL—pits these instructional patterns against CI serving as the "control group" or comparison condition, testing essentially the "equivalency hypothesis." Leaving aside the previous comments indicating that this hypothesis (i.e., the null hypothesis) cannot be tested, let's look to see how much consistency exists among findings of these reviews. We begin with the effort by Russell (1999), essentially a vote-count analysis. Russell argues that because the vast majority of DE studies submitted to his website (which encourages readers to submit studies) show "no significant difference," there must be no difference between DE/OL and CI.

However, Russell's work is not a true vote-count analysis. Vote-counts use the significance level of individual studies to classify them into "significantly negative," (i.e., control > treatment) "no significant difference" (i.e., control = treatment) and "significantly positive" (i.e., treatment > control). The category that has the greatest frequency "wins." Russell refers to his findings as "the no significance phenomenon" because the preponderance of studies fall into the middle category. One major problem with this approach is that sample size affects the test statistic needed to reject the null hypothesis (i.e., this is called the power of a sample). Small samples tend to produce more "no significant difference" (NSD) results while large samples produce more significant results (all other things being equal). This means that misclassification is a distinct possibility with smaller samples producing more NSD results and larger samples producing the opposite. The latter is a Type I error problem and the former is a Type II error problem. As a result, it is difficult to tell whether Russell's claim of equivalence is viable or not. Vote-count synthesis as an unbiased methodology has largely been discredited (Friedman, 2001).

Meta-analysis was introduced (Glass, 1976, 1977) as an alternative methodology to overcome the obvious limitations of the vote-count approach. In meta-analysis, a *d*-type metric called an effect size expresses the standardized difference between the mean of the treatment and the mean of the control (i.e.,). Cohen's *d* is then often converted to Hedges' *g* to correct for small sample bias. The set of *d*-type effect sizes is then synthesized using an approach involving "inverse variance weighting," so that small samples get less weight and large samples get more. The symbols $\bar{d}$ and $\bar{g}$ indicate the average effect size of the set of effect sizes. Table 7.1 presents these averages in the column labeled "Mean/Significance/Model." It is important to note that the significance of $\bar{d}$ or $\bar{g}$ follows the same power logic as inferential statistics, except using population statistics (i.e., particularly the standard error), so that seemingly small average effect sizes may appear significant for a large number of primary studies and not significant when there are fewer studies included in the meta-analysis.

So what does the evidence suggest about the equivalency hypothesis? For meta-analyses labeled DE in Table 7.1 (as opposed to OL and BL), average effect sizes range from $\bar{d} = -0.01$ (Bernard, Abrami, Wade, Borokhovski, & Lou, 2004 for synchronous DE conditions) to $\bar{d} = 0.37$ (Shachar & Neumann, 2003), with the majority hovering around 0.00. There are two exceptions (Cavanaugh, 2001; Williams, 2006) that are slightly at variance from this majority. However, Cavanaugh investigated what was called "interactive DE," and the sample that Williams used was adult healthcare

Table 7.1 Summary of quantitative systematic reviews and meta-analyses published between 2000 and 2014—student achievement in DE, OL, and BL vs. classroom/traditional instruction

Author(s) Publication Year	*Inclusive Years*	*Learner Population*	*DE Context*	*Number of* ESs (k)/ *Studies*	*Mean/ Significance/ Model*	*Homogeneity of Effect Size*	*Moderator Variables*
Spanjers et al. (2015)	Unknown	All learners	BL	24 studies (k = 24)	$\bar{g}$= 0.34* (R)	No	Yes
Bernard, Borokhovski, Schmid, Tamim, & Abrami (2014)	2000–2010	Higher education	BL	k = 117	$\bar{g}$= 0.33* (R)	No	Yes
Means, Toyoma, Murphy, and Bakia (2013/2009)	1996–2008	Mostly higher education	OL	k = 27	$\bar{g}$= 0.05 (R)	No	Yes
			BL	k = 23	$\bar{g}$= 0.35* (R)	No	Yes
Cook et al. (2008)	1990–2007	Health workers	OL	63 studies	$\bar{g}$= 0.12* (R)	No	Yes
Jahng, Krug, and Zhang (2007)	1995–2004	Higher education	OL	k = 20	$\bar{d}$= 0.02 (F)	No	Yes
Sitzmann, Kraiger, Stewart, and Wisher (2006)	1996–2005	Adults (training)	Web-based (OL)	k = 71	$\bar{d}$= 0.15 (F)	Not Specified	Yes
Williams (2006)	1990–2003	Health workers	All DE	k = 34	$\bar{d}$= 0.15 (F)	No	Yes
Zhoa, Lei, Yan, Lai, and Tan (2005)	1966–2002	Higher education	All DE	k = 98	$\bar{d}$= 0.10 (R)	No	Yes
Cavanaugh, Gilan, Kromrey, Hess, and Blomeyer (2004)	1999–2004	K-12	Web-based (OL)	k = 116	$\bar{d}$= -0.03 (F)	No	Yes
Bernard et al. (2004)	1985–2002	All learners	Asynchronous DE	k = 174	$\bar{g}$= 0.05* (F)	No	Yes
			Synchronous DE	k = 92	$\bar{g}$= -0.10* (F)	No	Yes
Allen et al. (2004)	Not Specified	Not specified (all learners)	All DE	k = 39	$\bar{r}$= 0.05 ($\bar{d}$ = 0.10)(F)	No	Yes
Shachar and Neumann (2003)	1990–2002	Not specified (all learners)	All DE	k = 86	$\bar{d}$= 0.37* (F)	No	No
Cavanaugh (2001)	1980–1998	K-12	DE	k = 19	$\bar{d}$= 0.15 (R)	No	Yes
Russell (1999) Vote-Count Review	1999–present	All learners	All DE	Undetermined	"No significant difference"	N/A	N/A
Machtmes and Asher (2000)	1943–1997	Higher education	Tele-Courses	k = 19	$\bar{d}$= -0.01 (F)	No	Yes

*$p < .05$

workers. Also, both of these meta-analyses encapsulated training applications of DE rather than more general subject matters that might be found in K-12/university curricula.

In the meta-analyses that examined OL learning courses, a similar pattern emerges. Three syntheses found mean effect sizes hovering around 0.00, but two (Sitzmann et al., 2006; Cook et al., 2008) found average effect sizes of 0.15 and 0.12, respectively. Again, Sitzmann's study was about adult training and Cook's addressed healthcare workers. The syntheses of BL studies are a little more consistent. Means et al. (2013), Bernard, Borokhovski, Schmid, et al. (2014), and Spanjers et al. (2015) found average effect sizes ranging from 0.33 to 0.35, all still in the category of low effect sizes (Cohen, 1988), but somewhat above both studies of general DE and OL.

The next thing to consider is the heterogeneity statistics associated with these average effect sizes. High heterogeneity between studies (as measured by the statistics Cochran's Q_{Total} and I^2) suggests that the effect size distributions are spread significantly around the average effect size. Essentially, this means that a considerable number of primary studies demonstrated that the treatment (i.e., DE/OL/BL) outperformed the CI control condition, but a considerable number performed in the reverse manner (DE/OL/BL < CI). The fact that all meta-analyses in Table 7.1 produced heterogeneous results (i.e., none were homogeneous) says that the means are not fixed-point estimates but may range more widely either above or below the calculated weighted mean. Just as a note, most meta-analyses done prior to about 2008 used the fixed effects model for synthesizing effect sizes. After that, all syntheses used the random effects model. This was around the time when Borenstein, Hedges, Higgins, and Rothstein (2009) clarified the importance of using the correct synthesis model (Note: the fixed and random models had been discussed in earlier works by Hedges and Olkin [1985] and Lipsey and Wilson [2001]). They unambiguously recommend the random model in areas of study (including education) in which the primary studies used in a synthesis display considerable differences in design, methodology, treatment definitions, and outcome measures. It is now clear that all of the studies listed in Table 7.1 should have used the random rather than the fixed model of synthesis. This is especially important for testing the "equivalency hypothesis," because treatments and controls are not expected to be identical except for the "active ingredient" of distance. A very readable account of the differences between these models and the appropriate conditions for the use of the fixed and random models can be found in Borenstein et al. (2009).

The overall impression (i.e., preponderance of evidence) derived from the meta-analyses contained in Table 7.1 is that DE/OL/BL instructional conditions can at least be equal to CI in terms of student achievement, and in some instances can exceed it. There is, of course, that cadre of primary studies wherein CI exceeds DE/OL/BL. It is never clear from the overall weighted mean—whose distribution of effect sizes is judged to be heterogeneous—what instructional conditions might explain the heterogeneity. Meta-analysis has a means of exploring unexplained heterogeneity; the approach is called moderator variable analysis, and this will be addressed in the next section.

What Makes the Difference Between Instructional Conditions?

Moderator variable is intended to explain variability in effect size. Coding moderator variables is a time-consuming and expensive undertaking, since each study must be coded (preferably double-coded) against a predetermined set of categories and their levels that are expected to moderate the overall weighted effect size. These categories might be demographic (e.g., grade level, subject matter), methodological (e.g., research design, kind and quality of dependent measures), technical (e.g., type of media used), or instructional/substantive (e.g., student-student/teacher/content interaction, time on task, feedback, use of quizzes, or other interim assessments). Generally speaking, these variables are treated in meta-analysis much like post hoc analysis in primary studies. Significance testing for inter-category differences is done using Cochran's Q_{Between}. Table 7.2 shows the construction of a mixed-effect (i.e., containing elements of both the fixed and the random models) moderator analysis

Table 7.2 Example moderator analysis between QEDs and RCTs (Variable = Study Design)

Levels	*Effect Size and 95th Confidence Interval*						*Test of Null*		*Heterogeneity*	
	k	$\bar{g}$	*Standard Error*	*Lower 95th*	*Upper 95th*	*z-Value*	*p-Value*	*Q-Value*	*df*	*p-Value*
QED	70	0.413	0.05	0.31	0.52	7.88	.00			
RCT	73	0.242	0.04	0.17	0.32	6.18	.00			
Total between								6.84	1	.01

of research design (Bernard, Borokhovski, & Tamim, 2014), where QED means quasi-experimental design and RCT means randomized control trial. Notice that QEDs produce a significantly higher ($Q_{Between}$ = 6.84, *df* = 1, *p* = .01) category average than RCTs, a not too uncommon occurrence in the literature. However, the point is that moderator variable analysis represents a means for exploring the heterogeneity that was present in the initial analysis. Most moderators are categories, but some may be scales (either ordinal or interval). In these cases, inverse-weighted meta-regression analysis is often used as an alternative to the analysis of variance (ANOVA) analogue.

It should be understood that meta-analyses that employ moderator variables to explain heterogeneity in the overall analysis almost never fully succeed. Obviously, some heterogeneity in the overall analysis is random and can never be explained through rational moderator analysis. This is partly because heterogeneity can result from methodological, demographic, and/or substantive instructional conditions. Most meta-analyses can explore a limited number of these, and if the moderator analyses are done through ANOVA analogues, the heterogeneity can never be entirely explained through individual tests, no matter how many are conducted. Multi-meta-regression is sometimes used to explore ordinal or interval moderators, but nominal level variables require dummy coding in regression, so the complexity of the analysis rises as more categorical moderators are added. Therefore, the best that can be expected from moderator variable analysis in educational contexts is piecemeal and fragmented findings that, of course, are susceptible to the vagaries of bias, selectivity on the part of the analyst, and important concerns about interactions and confounding among moderator variables tested separately.

In spite of these caveats, a number of interesting results have emerged from the moderator variable analyses conducted as follow-ups to the primary findings. In examining Table 7.3, it is clear that there is little unanimity across all studies in regard to the moderator variables investigated. However, a few trends do emerge. Student interaction, collaboration, and discussion emerged as a moderating influence in several studies. In a subsequent meta-analysis, Bernard et al. (2009) identified three interaction patterns in DE (student-student, student-teacher, and student content) first described by Moore (1989) and elaborated upon by Anderson (2003), providing evidence that more vs. less interaction, in all three realms, produced significant moderation effects. Most of the meta-analyses described here predated the highly interactive conditions that exist in modern DE/OL/BL classrooms, so it is likely that many of the moderating predictions in these meta-analyses will have already been enacted in this particular area. Practice, feedback, and incremental quizzes (i.e., formative evaluation) also appeared as important in several meta-analyses. There is a large literature in the CI realm that demonstrates that these instructional elements are equally important in all educational settings. In one unique result, Bernard, Borokhovski, Schmid et al. (2014) found that the type of software applications used by BL students, cognitive or mind tools (e.g., Excel, simulations, games) vs. presentational tools (e.g., PowerPoint), benefited student achievement. A similar finding emerged from the meta-analysis of technology use in higher education (Schmid et al., 2014). It is arguable that cognitive tools facilitate knowledge engagement to a greater extent than tools that simply support the reception of information. A similar point was the focus of a historic debate, primarily between Richard E. Clark and Robert Kozma, in the early 1990s.

Table 7.3 Summary of significant moderator variables

Author(s) Publication Year	*Dominant Pattern*	*Primary finding(s) from moderator analysis*
Spanjers et al. (2015)	BL	In-class quizzes moderated BL and CI significantly
Bernard, Borokhovsi, Schmid et al. (2014)	BL	Computer tool use (cognitive tools vs. presentation tools) in BL moderated significantly
Means et al. (2013)	BL	More time, resources and interaction for BL compared to CI
	OL	Collaboration exceeds individual and instructor-based in OL vs. CI
Cook et al. (2008)	OL	Online discussion found to moderate vs. CI
Sitzmann et al. (2006)	OL	Practice and feedback moderated OL vs. CI
Williams (2006)	DE	Extra ID features in DE vs. CL
Zhoa et al. (2005)	DE	Interaction improves students in DE
Cavanaugh et al. (2004)	DE	No factors found to moderated DE and CI
Bernard et al. (2004)	Asynchronous DE	Use of problem-based learning strategies moderated DE and CI
	Synchronous DE	No significant moderators found
Allen et al. (2004)	DE	No factors found to moderated DE and CI
Cavanaugh (2001)	DE	No significant moderators found
Machtmes and Asher (2000)	DE tele-courses	More interaction moderated DE and CI

As a final note, two meta-analyses have attempted to break out of the comparison paradigm of the majority of meta-analyses just reviewed and criticized by Cook (2009) and others, to attempt comparisons between two DE conditions (as contrasted with comparisons between DE/OL/BL and CI). There are plenty of primary studies to review in the DE/OL/BL literature that are regularly excluded from DE vs. CI reviews. Bernard et al. (2009) conducted a meta-analysis comparing different levels of interaction in DE using the distinctions between forms of student-student (S-S), student-content (S-C), and student-teacher (S-T) interaction. In order to accomplish this, they had to find primary studies that compared two DE conditions in which there existed some form of student interaction in both conditions. As is immediately obvious, some mechanism was needed to produce a consistent treatment-control relationship so that each effect size would have the same valence. The researchers decided on a fairly complicated procedure and rule structure for separating groups into more or less interaction. The condition with the most student-student interaction, for instance, became the treatment condition and the one containing less interaction was treated as the control group. The results verified the preeminence of more interaction vs. less interaction in all three patterns. S-S interaction produced an average effect size of $\bar{g} = 0.49$, $k = 10$; S-C interaction produced an average finding of $\bar{g} = 0.46$, $k = 20$; and S-T interactions averaged $\bar{g} = 0.32$, $k = 44$. The three forms were significantly different from zero. Aside from providing a quantitative demonstration of the importance of interaction in DE, a result found in several prior meta-analyses when compared with CI, the study also demonstrated that a meta-analysis in DE need not be focused solely on DE vs. CI comparisons.

Borokhovski, Tamim, Bernard, Abrami, and Sokolovskaya (2012) was conducted as a derivative of the 2009 meta-analysis and involved contrasting designed interaction treatments with contextual treatments. As the term implies, designed treatments were intentional media or instructional conditions created for facilitating S-S, S-C, or S-T interaction. Contextual treatments contained similar interaction affordances, but evidence of intentional instructional design was absent. For instance, what is the difference between designing for collaborative learning or simply providing the facilities for student collaboration without providing the framework for activating formal collaboration?

The meta-analysis found that designed collaboration conditions outperformed contextual conditions ($\bar{g}$ = 0.50, k = 14 vs. $\bar{g}$ = 0.22, k = 22, Q_{Between} = 6.37, p = .01), suggesting a similar perspective echoed in the general instructional design literature that design makes a difference. The implication of the two meta-analyses is that interaction is an important element of DE/OL success, but that intentional design for interaction provides an additional advantage over simply providing interaction affordances such as email, chat rooms, discussion boards and synchronous video chat.

Research Questions Asked and Answered by Qualitative Meta-Syntheses

Meta-synthesis (the general name for qualitative syntheses), or the summarizing of primary qualitative studies, has a shorter history than meta-analysis, yet it possesses the potential to help answer questions that meta-analysis cannot. Meta-analysis requires a quantitative metric that exists across all of the studies that are to be synthesized. Meta-synthesis does not. Meta-analysis operates under the fairly rigorous rules of research design, measurement validity, statistical rigor, and generalizability. Meta-synthesis, in that regard, is a more inclusive methodology. Both types of review may, and normally should, use a systematic approach to data collection and analysis (see Cooper, 2016; Gough, 2007). So-called "purposeful synthetic methods" may be used by qualitative analysts to explore specific questions within a specific literature, and therefore may not be generalizable in the same way that a systematic review (meta-analysis) intends to be.

Table 7.4 contains a selection of qualitative syntheses that have been published (or added to the literature in the case of two dissertations) from 2004 to 2016. There are several noteworthy differences between these and the meta-analyses shown in Table 7.1. Generally speaking, qualitative syntheses tend to involve far fewer studies than meta-analyses. Also, they range across the spectrum of questions addressed and answered; there is little uniformity, as there is with meta-analyses. However, it might be noted that the large number of meta-analyses in the DE/OL/BL literature that attempt to ask and answer essentially the same question (i.e., "How does DE/OL/BL differ from CI?") sets it apart from most other research literatures in Education. Qualitative syntheses also use a wider variety of methodologies, some of which aim to generalize (systematic reviews) and others which aim to describe research around more circumscribed questions (purposeful reviews). Meta-analyses are usually systematic reviews that intend to describe as much of the population of studies as possible. Also, meta-analyses draw upon a large and growing methodological literature that to some extent derives from the long tradition of experimentation. The methodological literature of qualitative synthesis is far more recent, with many of the instances exposed to limited application (e.g., meta-ethnography). Therefore, it is more difficult for journal reviewers and dissertation committees to apply specific standards of quality. Still, qualitative synthesis represents a means of bringing together the large and widening literature of quality primary studies that possess the great potential to not only inform the field of DE/OL/BL, but also to supplement the findings of meta-analyses from a different perspective.

Most of the syntheses listed in Table 7.4 are directed toward primary studies of students in higher education or adult workers (e.g., medical workers). Most, with the notable exception of Abrami et al. (2006), are expressed as narrative descriptions supported by examples and even quotations. One of the reviews listed in Table 7.4, Tallent-Runnels et al. (2006) is a traditional narrative review centered on a set of somewhat arbitrarily selected topics. It appears that primary studies were selected to support the main themes, rather than allowing the data to guide the analysis. According to Jackson (1980), this is the most subjective and least informative form of review, resembling something closer to the review of literature in a thesis or dissertation than what we now know of as a systematic review. The study by Wong et al. (2010) is by far the most extensive from the perspective of the literature encapsulated, and the rigor, explanation, and justification of methodology applied to it.

Table 7.4 Selected qualitative syntheses

Author(s) Publication Year	*Synthesis Model*	*Context*	*Population*	*Number of Studies*	*Brief description*
Kineshanko (2016)	Thematic synthesis	DE/OL/BL	Higher education	329 artifacts	Examines the nature, focus, and context of the research literature relating to the Community of Inquiry (CoI) framework applied to DE, BL, and OL
Blackmon (2012)	Selective narrative synthesis	OL	Higher education	11	Investigates some of the student outcomes of discussion board/chat use in OL
Blackmon and Major (2012)	Meta-synthesis	OL	Higher education	10	Explores students' experiences with online learning along several themes: balancing school and life, time management, personal responsibility, and instructor accessibility
Tuquero (2011)	Meta-ethnographic synthesis	DE	Higher education	5	Synthesizes the findings of five dissertations that focused on DE support services
Wong, Greenhalgh, and Pawson (2010)	Realist synthesis	OL medical courses	Professional staff	249 papers	Produces theory-driven criteria to guide the development and evaluation of Internet-based medical courses
Major (2010)	Meta-ethnography	OL	Higher education	Unknown	Intends to "make meaning" of individual studies that investigated faculty experiences of teaching online
Gagne and Walters (2009)	Meta-synthesis	DE	Higher education	9	Investigates themes related to instructor experiences in online teaching related to critical thinking and community inquiry
Abrami et al. (2006)	Argument catalogue (similar to a case survey)	e-learning (including DE and OL)	All levels	726 documents	Reviews e-learning in Canada from several perspectives: (a) document source; (b) areas/themes of e-learning; (c) value/impact; (d) type of evidence; (e) research design; (f) area of applicability; (g) pedagogical implementation factors; (h) a priori attitudes; (i) types of learners; (j) context; and (k) technology factors, all using a qualitative framework
Tallent-Runnels et al. (2006)	Narrative theme-based review	OL	Higher education	Selected studies	Summarizes research on OL course environments, learner outcomes, learner characteristics, and institutional and administrative factors
Waight, Willging, and Wentling (2004)	Selective theme-based review	E-learning	General	15	Provides a basic insight on what government, business, and professional organizations are saying about e-learning

Sometimes it is difficult to determine the specific methodological perspective used, since the review is referred to as a meta-synthesis (e.g., Blackmon & Major, 2012; Gagne & Walters, 2009), a rather generalized term encompassing several more specific approaches. None of the reviews shown in Table 7.4, except for Abrami et al. (2006), takes a quantitative approach to synthesizing qualitative studies or a qualitative approach to synthesizing quantitative studies. A notable example of the latter that is not within the scope of this paper is a second-order meta-synthesis of the problem-based learning literature (Strobel & van Barneveld, 2009). The EPPI-Centre (Evidence for Policy and Practice Information and Coordinating Centre; EPPI-Centre, 2006–2009), a part of the Social Science Research Unit at the Institute of Education, University of London, has been a pioneer in developing methodologies and publishing research that mixes qualitative with quantitative primary studies.

Despite the diversity in these respective research questions and forms of review, it is possible to identify some common findings of the meta-syntheses presented in Table 7.4. Most interesting is that they not only are similar to each other, but also bear a striking connection to some of the major findings of the DE/OL/BL meta-analyses considered earlier. For example, the focus on communities of inquiry (Kineshanko, 2016; Gagne & Walters, 2009) echoes meta-analytical findings with regard to interactions among learners, and especially to designed collaborative interaction treatments (e.g., Borokhovski et al., 2012). Another emerging common topic is the importance of support for learning, understood broadly as the provision of resources, training, services, etc. for those implementing DE/OL/BL (e.g., Tuquero, 2011; Abrami et al., 2006) and more narrowly as specific tools and pedagogical arrangements directly supporting learners' cognition (e.g., Bernard, Borokhovski, Schmid, 2014).

Research Going Forward: Form But Little Substance

There are so many existing and emerging areas for substantive primary research in DE/OL/BL contexts that it is difficult to specify, from our perspective, which should be highlighted and which should not. All are potentially useful—some will pan out and some will not. Even so, there are some perspectives on methodological approaches and the forms of research questions and evidence that might prove useful for future practitioners. It is often said that the meta-analyst/meta-synthesist is a "prisoner of the past," always waiting with bated breath for the time when a corpus of studies is available for collection, analysis, and synthesis. This means that primary researchers must act first, asking and answering pertinent research questions that help the field move forward while providing practitioners with practical advice that can be acted upon. From our current perspective, this does not include studies that contain comparisons of DE/OL to CI. Been there, done that. To use David Cook's (2009) analogy, can you imagine how far automobiles would have developed if they had always been compared to their reasonable alternative at the turn of the 20th century, the horse? In spite of Henry Ford's declaration that "if I'd listened to my consumers, I'd have given them a faster horse," (Sherrington, 2003, p. 8) the driving public got something much better than a faster horse, largely because it was abandoned as the comparison condition. Our field must do the same if research is to have a reasonable chance of affecting practice. The problem, of course, is not that meta-analysts cannot handle primary research that compares one DE/OL/BL condition to another one; it is that these forms of comparative research are not appearing in the literature. It is far too easy for researchers to make comparisons with CI rather than create the conditions for asking and answering more meaningful questions.

Qualitative researchers do not suffer as much from the temptation to investigate questions that have so frequently been addressed by others. In fact, the problem is quite the contrary. The questions addressed by qualitative researchers, it seems, range so widely that it is difficult to distinguish a corpus of like studies that can be considered as reaching more general conclusions.

Final Thoughts

In the absence of an empirical primary literature surrounding a particular question, there can be no systematic reviews, either qualitative or quantitative. So to this extent, the questions that have been asked and answered by analysts of DE/OL/BL (How do they compare to CI conditions?) are simply expressions of the level and type of questioning that was initiated by primary researchers. Following from this line of reasoning, it is unsurprising that so little has been learned beyond the basic question about the difference between two quite different instructional patterns. Even in terms of questions arising from the analysis of demographics (e.g., age level, course content), does it really make sense to say, for instance, that undergraduate students outperform students in graduate courses without first knowing how instructional strategies differed in the two patterns? Bernard, Abrami, Lou, and Borokhovski (2006) addressed this issue in an article entitled "A Methodological Morass? How We Can Improve Quantitative Research in Distance Education." They argued, among other things, that the "equivalence question" has outlived its usefulness and that progress can only be made if comparisons are made between equivalent DE/OL/BL conditions that employ different instructional methods, so that "method" becomes the active ingredient or independent variable rather than distance or the medium that is used to bridge the distance. In spite of these admonishments, DE/OL vs. CI primary studies continue to be churned out. Changing the focus of DE/OL/BL research to important questions of design, interaction, student and teacher involvement, feedback, etc., is critical to remaking this literature. If this cannot be accomplished, quantitative research in DE/OL, and to some extent BL, risks becoming irrelevant to practice in these areas.

The challenge for the qualitative analyst is different, but no less daunting. Since there is no simple question (or set of questions) to guide inquiry, a dizzying array of research questions and methods/paradigms has arisen in the literature, making it difficult to look across even the meta-syntheses, much less the primary literature, to capture common threads that might suggest trends and promising directions. It seems that a catalogue or even a concept map of this literature as it currently exists, if it can be produced, might eventually lead to more direction and coherence.

By all accounts, the progress of DE/OL/BL is a force to be reckoned with, whether in the presence or absence of a strong empirical research culture. It is our firm conviction, however, that both quantitative and qualitative research can make a difference in understanding the present and reconceptualizing and planning for the future.

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(The ⋆ indicates studies included in Tables 7.1, 7.3, and 7.4)

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PART 2

Teaching and Learning

An Overview

William C. Diehl

Learning and teaching come into focus in Part 2 of this handbook. Each chapter addresses research on topics related to learner characteristics or support of the diverse heterogeneity of distance education students.

Richard E. West, Janette R. Hill, and Liyan Song provide in Chapter 8 a lens for better understanding cognitive information processing and discuss how humans receive, process, store, activate, and act upon information. They discuss cognitive demands, scaffolding, motivation, metacognition, and then implications for research, theory, and practice in distance education.

Chapter 9 focuses on student satisfaction. Mike Allen, Kikuko Omori, Andrew W. Cole, and Nancy Burrell cover the use of meta-analysis for providing evidence when making decisions concerning student satisfaction. Environmental factors, the relationship between technology and social presence, communication, and facilitation are just some of the areas that the authors cover.

Understanding factors that impact student persistence is critical for programs. In Chapter 10, Tina Stavredes and Tiffany M. Herder review persistence models, and discuss cognitive scaffolding strategies for designers and instructors, including procedural (e.g., navigating course environments), metacognitive (e.g., thinking processes), conceptual (e.g., what to consider, reflection), and strategic (e.g., completing tasks). Next, Maggie Hartnett focuses in Chapter 11 on motivation, one of the recurring factors in student success that has been touched upon in previous chapters. Readers will gain a deeper understanding of the many aspects of this topic through discussion of definition(s), conceptual foundations, theories, and strategies.

A key factor in the organization of a distance education system is library services. In Chapter 12, Elaine Fabbro and Jennifer Rempel outline the myriad areas that are key to providing successful support—and share valuable professional resources that readers can pursue.

Blended learning models have become widespread and come in many varieties across educational organizations. Charles R. Graham's Chapter 13 is a comprehensive overview that addresses the growth of blended learning, definition issues, models and theory, research, institutional issues, access and growth, cost effectiveness, student engagement and learning effectiveness, and faculty roles and issues. Researchers interested in this area will also find an identification of areas needed for future research.

In Chapter 14, Melody M. Thompson approaches the current state of the field from a philosophical and ethical viewpoint. The reader is challenged to consider the idea that there is a responsibility to care for the relationships that are at the heart of distance educational programs. From responsibilities of students and teachers, how we design our courses, the role that technology plays, and the

purpose of scholarly literature, the importance of minding the ethical dimensions of our practice and research are at the core of what will continue to sustain our field.

The ubiquitous nature of personal electronic devices around the world has given rise to the concept of *mobile learning*. In Chapter 15, Zane Berge defines, provides theoretical foundations, presents the capabilities, challenges, and potential of this mode of educational delivery and point of 24/7 access for learning.

This section presents multiple chapters that address instructional design. Elizabeth Childs and Susan Crichton consider in Chapter 16 institutional pressures that impact distance education in higher education from a design-based instructional approach. Areas of focus include speed of institutions to adapt to change, the value of formal degrees vs. student debt, the cost of recruiting quality faculty members, waning governmental support, alternative student learning resources, and globalization. The authors argue that these factors affect organizations across pedagogical approaches, and that design thinking can be an effective strategy for success.

Social interaction and collaboration is a thread running through most of the chapters in this handbook thus far, and in Chapter 17, authors Priya Sharma, Kimberly Tohill, Philip Tietjen, and Mahir Akgun direct our attention to technology and the role of social media use in online and blended courses. Readers will learn what research has to tell us about the effectiveness for learning, the impact upon interactivity, relationships, and community building—and will also take away recommendations for design and integration. In her Chapter 18, Vanessa Dennen pursues the topic of interaction in online courses and in the role that frameworks play regarding design, facilitation, and research of online learning activities. Integration of theoretical frameworks such as positioning theory, transactional distance, activity theory, CoI, online knowledge activity framework, participatory culture perspective, among others—provides researchers with a solid foundation of potential approaches.

Continuing with our covering of theory to practice in instructional design, Rick L. Shearer and Eunsung Park present in Chapter 19 an in-depth look at theoretical frameworks and making design, pedagogical, and technology choices when addressing questions regarding: design using teams or individual faculty members; personalization vs. a one-size-fits-all cohort model; content-centric vs. learner control; and breadth vs. depth. Their analysis also includes a look at factors surrounding costs of designing and developing courses. An excellent follow-up to the aforementioned chapter is found in Chapter 20 by Rebecca Heiser and Penny Ralston-Berg. Problem-based, scenario-based, experiential, story-based, game-based, design-based, and rhizomatic learning are just some of the design options/strategies that they cover. Subject matter experts, instructors and instructional designers, and ultimately students will benefit from what can be learned in this chapter.

Another thread running through the chapters in this handbook is the use of technology that can improve the quality of online courses. Shelley Kinash, James Birt, and Madelaine-Marie Judd ask in Chapter 21 whether online technologies have effectively leveled the playing field for students with disabilities. With growing student enrollment in distance education programs, there is also a growing diverse student population, and the authors present advancements and the challenges that remain, along with recommendations for design and delivery of courses that can serve diverse learners. This chapter also will serve to inform distance educators of the importance of professional development in this area. Following along with the theme of diverse populations, the importance of culturally inclusive collaborative inquiry-based learning is examined in the Chapter 22. Linda Barril discusses the importance of well-designed assessment, along with the challenges and strategies that can be incorporated into online courses. Readers should find that this chapter reinforces the importance of understanding the socio-cultural dimensions of their distance education courses and programs.

8

COGNITIVE PERSPECTIVES ON ONLINE LEARNING ENVIRONMENTS

Richard E. West, Janette R. Hill, and Liyan Song

Psychologists, philosophers, teachers, and instructional designers have, since the beginning of written records, sought for answers to how people learn. We know much more now than ever before, but the more we learn, the more we understand the complexity of human learning. Because teaching and learning are complex and dependent on individual and social characteristics, we may never come to a unifying theory. However, psychological theories about learning and human interaction are still critical to understand as they can help explain specific aspects of learning in ways that can inform policy and practice. Similarly, cognitive information processing (CIP) theories cannot explain all factors of good teaching and learning, but they can help us better understand how humans receive, process, store, activate, and act upon information.

Understanding learning theory, including CIP, is especially important in online learning. Because of the tendency to preemptively adopt every new technology as the newest revolution in learning, understanding instructional principles—based on theory—is a critical ingredient (Clark, 1994) to grounding our research and practice in online environments. We believe online learning involves many key instructional principles beyond individual cognition, including social influences (Hill, Song, & West, 2009), communities (Han & Hill, 2007; Sadera, Robertson, Song, & Midon, 2009), social presence (Borup, West, & Graham, 2012, 2013), and learning resources (Hannafin, Hill, Land, & Lee, 2014; Hannafin & Hill, 2008; Hill & Hannafin, 2001). However, with advancements in neuroscience, cognitive science has recently seen a rise in popularity (Aberšek, Borstner, & Bregant, 2014). In this chapter, we will focus on what research has taught us about effective online learning from the individual, information processing perspective.

Information processing perspectives, rooted in objectivist epistemology, assume meaning exists independent of the individual; individuals acquire and comprehend this meaning to become knowledgeable and productive with that knowledge. While there have been many alternative models for describing human cognition (Aberšek et al., 2014), historically, information processing models were characterized as "mind as computer" (Atkinson & Shiffrin, 1968) and "microscopes of the mind" (Massaro & Cowan, 1993). Within this model, there is theory about how learning happens and what mediating influences affect the learning.

According to cognitivists, information processing, in effect, involves the exchange of signals between external stimuli and internal mental processes such as sensory registers, selective perception, short-term memory (STM), and long-term memory (LTM) (Doolittle, Terry, & Mariano, 2009). Our senses detect external stimuli, which is then selectively filtered (often with little or no conscious awareness) into information processed temporarily in short-term memory (STM). Because STM

has limited capacity, much of the information is discarded while other data is further processed based on prior knowledge, represented in schemas (Norman, 1982), or associations between pieces of information that represent what we know about a subject (Anderson & Pirolli, 1984). *Skilled performance* comes from building more complex schemas comprised of lower-level schemas, and automation of the processing of schema knowledge subconsciously to reduce the burden on STM (Choi, van Merriënboer, & Paas, 2014).

Thus, durable learning in cognitive processing is the transfer of encoded information from STM to LTM (long-term, or permanent, memory). Subsequent retrieval involves recalling "learned" knowledge from LTM to working, or short-term, memory where it is compared with new information. Precisely what is learned and how well it is retrieved depends on how knowledge is represented: the more richly knowledge is encoded, the more likely it will be activated under appropriate conditions, retrieved (decoded), and applied or transferred to related situations.

Many scholars have applied key cognition principles to online learning environments (see, for example, Clark & Hannafin, 2011; Doolittle et al., 2009; Low, Jin, & Sweller, 2009; Mayer, 2005), showing that these theoretical perspectives are relevant to OLEs. Thus, in this chapter we will: (a) review and critically analyze research on four specific cognitive constructs in the context of online learning environments; and (b) describe the implications of cognitive perspectives for online learning research, theory, and practice.

Cognitive Constructs and Online Learning Environments

Based on this understanding of basic cognitive perspectives, we now present recent research evidence on how four specific information processing constructs apply to online learning environments (OLEs). While there are other relevant constructs we cannot discuss in this chapter, we will review research related to cognitive demands, scaffolding, motivation, and metacognition.

Cognitive Demands

Because cognition relies heavily on the effective functioning of short-term memory to process information into long-term storage, much research has focused on the demands various activities place on this short-term cognitive processing. *Cognitive Load* is the burden placed on STM during learning, and is separated into intrinsic load (the cognitive demand inherent in the learning task) and extrinsic load (determined by the instructional design of the learning task). Extrinsic load is further divided into extraneous (i.e., ineffective) load from poor instructional design or germane (i.e., effective) load (Choi et al., 2014; Gerjets & Scheiter, 2003; van Merriënboer & Ayres, 2005).

Intrinsic load, or the number of elements that need to be processed in working memory (STM), is influenced by individual expertise and the inherent task complexity in to-be-learned material. For example, learning from a biology text may present a higher intrinsic load than reading a children's story to the everyday person, but not to a scientist (Pollock, Chandler, & Sweller, 2002). Since a great deal of to-be-learned knowledge and skill made available at a distance is designed for non-experts, intrinsic load is especially relevant to OLEs.

Extraneous load is related to how material is presented or activities that are engaged by the learner (Schunk, 2012). Well-organized information, instructions, and tools tend to minimize extraneous load, while poorly organized information and tools engender higher extraneous load (Hsiao, Brouns, Kester, & Sloep, 2013). In effect, to the extent the learner must expend cognitive resources simply to locate and access content, extraneous load (and effort) increases, possibly leading to learner disorientation in online environments, and perhaps even frustration with the overall learning experience.

Germane load is the amount of working memory needed to create new or activate existing schemas to learn desired or required concepts (Gerjets & Scheiter, 2003; Renkl & Atkinson, 2003).

Germane load involves the allocation of cognitive resources that are appropriate for processing and perhaps even automatizing the task (Cheon & Grant, 2012a). Thus, effective instructional design of online learning (or any learning environment) should select and design learning activities that optimize intrinsic load, reduce extraneous load, and enable helpful germane load (Leppink, Paas, Van der Vleuten, Van Gog, & Van Merriënboer, 2013). Increasing germane load may help improve the efficiency of learning, while increasing extraneous load may prove inefficient, ineffective, and overwhelming for learning (van Merrienboer, Schuurman, de Croock, & Paas, 2002).

Historically, researchers have studied cognitive load through post-treatment questionnaires, where learners self-report their mental effort (Paas, van Merrienboer, & Adam, 1994; Paas, Tuovinen, Tabbers, & Van Gerven, 2003) or rate the difficulty of the material they learned (Kalyuga, Chandler, & Sweller, 1999). More recently, Brunken, Plass, and Leutner (2003) argued for direct, objective measures of cognitive load. A few measures of cognitive load have been developed that provide insight into how to increase germane load and decrease inefficient extrinsic load to assist with online learning.

Researchers have suggested that interface design in OLE may increase extraneous load. Cheon and Grant (2012b) explored the influence of meaningful activities related to user interface design and germane cognitive load in Web-based instruction. They tested a new instrument to measure germane cognitive load as well as conducted a usability test to measure extraneous cognitive load. Results indicated a connection between germane and extraneous cognitive load. While further testing of the instrument was recommended, the authors concluded that intrinsic and germane cognitive load contributed positively to Web-based learning.

Intrinsic load was a focal point for another study conducted with medical residents about the use of a simulation for learning. Naismith, Cheung, Ringsted, and Cavalcanti (2015) involved 38 medical residents using a simulation to demonstrate procedural skills. Results from the study indicated that use of the simulation decreased intrinsic load for the residents. In the hectic and busy environments where residents work with patients, reducing intrinsic load may enable an increase in germane cognitive load.

The Naismith et al. (2015) study is one example of a recent study exploring cognitive load in medical education (Haji, Rojas, Childs, de Ribaupierre, & Dubrowski, 2015; Tweed, 2015). Most recently, de Araujo et al. (2016) explored cognitive load in a study during emergency room clerkships with medical students with 304 sixth-year medical students. These students participated in the virtual rounds designed to simulate emergency room patients. Results indicated that the students perceived a lower cognitive load from the virtual rounds when compared to the real medical rounds. This may provide a context wherein students can practice prior to working with patients. Further, given that a lower cognitive load may be related to more effective learning, this result is promising for medical education in emergency clerkships.

Some researchers have examined the specific relationship between cognitive load and learners' success online. For example, McQuaid (2010) found that learner's confidence was the single most important factor determining e-learning success. McQuaid focused on the cumulative and task-specific cognitive loads experienced by e-learners resulting from the five major tasks required in the asynchronous course. The National Aeronautics and Space Administration-Task Load Index (NASA-TLX) was employed to measure the cognitive load experience by e-learners in this asynchronous course. The measured cognitive load was compared against each of those five tasks. The correlational analyses indicated that the more confident the learners were, the less cognitive load they would experience; the higher the learners' self-efficacy level, the lower their experienced cognitive load level. In other words, learners' self-efficacy and confidence were found to be critical factors affecting the level of cognitive load that learners would experience in asynchronous courses.

Researchers have also been exploring how to reduce cognitive load during discussions in online courses. Hsiao et al. (2013) proposed peer support to facilitate knowledge sharing during online discussions. While yet to be fully researched, the authors contended that support with knowledge

sharing can reduce extraneous cognitive load, thus enabling a greater focus on knowledge construction. Yen et al. (2015) proposed strategies for managing cognitive load by using log data from a learning management system as well as social networking as a way to monitor intrinsic cognitive load. In their study, 69 students participated for nine weeks, with all interactions recorded. Content experts assessed intrinsic cognitive load, and instructional strategies were adjusted based on data analysis. Guidelines for reducing intrinsic and extrinsic load were suggested to assist in establishing a cognitive load useful for learning.

In another study, Huang (2011) examined the impact of online game-based learning environments on learners' goal-setting activities and cognitive loads. The results from this study indicated that students reported significantly higher levels of intrinsic load than the germane load due to the novelty of the subject matter, implying a relationship between learners' intrinsic load and the subject matter and/or instruction delivery method. More research on how varying levels of expertise impacts intrinsic load in OLEs could help understand learners' adaptive learning in OLEs (Federico, 1999).

Researchers have also looked at cognitive load within specific subject areas. For example, Kun, Ching-Huei, Wen-Shiuan, and Wei-Yu (2015) focused on interactivity of question prompts and feedback in the context of a secondary science class. They randomly assigned 118 ninth grade students to four experimental conditions: presence/absence of question prompts, and two types of instructional feedback. Analysis from the 2×2 factorial design found a significant interaction between question prompts and instructional feedback. Overall results indicated problem-solving question prompts and corrective feedback resulted in lower cognitive load.

Tindall-Ford, Agostinho, Bokosmaty, Paas, and Chandler (2015) explored cognitive load within the context of a secondary geometry course. Students used an online system that enabled them to move text to better match a visual linked to the text. By enabling the students to move the text to better align with the images, learners were able to reduce searching between text and images. Results indicated the increased link between text and image reduce cognitive load enabling a greater focus on learning.

While research is ongoing and continues to provide insights into cognitive load, there is still much to be learned and understood about managing cognitive load, particularly in online learning. Refinement of instruments to measure cognitive load is also needed. Cheon and Grant (2012b) designed a new instrument to measure cognitive load types and interface design. Initial results indicated that the instrument enabled more fine-tuned assessment of cognitive load, although additional research is needed. Naismith et al. (2015) tested two of the main instruments typically used to measure cognitive load (the Paas Cognitive Load Scale and the NASA Task Load Index [TLX]), as well as a questionnaire (cognitive load component [CLC]) designed by Naismith et al. developed to assess total cognitive load, i.e., "intrinsic load (or how complex the task is), extraneous load (how the task is presented) and germane load (how the learner processes the task for learning)" (p. 805). After calculating Pearson's correlation coefficients to assess agreement among the instruments, results indicated The Paas Scale, TLX, and CLC questionnaire were consistent with measures of intrinsic cognitive load, but not of total cognitive load. Ongoing research and refinement of instruments will enable more refined techniques for measuring cognitive load.

Scaffolding

One strategy to reduce extraneous load while supporting germane load is through cognitive scaffolding, or the introduction of supports to facilitating the processing of information. According to Wood, Bruner, and Ross (1976), scaffolding is the support given to assist individuals as they engage in a task. Support could include, but is not limited to, responding to questions, providing resources, and providing access to experts. Over time, this support is reduced, or faded, as individuals become more skilled. Scaffolding has been used in a variety of contexts, and some researchers have provided

examples (e.g., Dabbagh, 2003) and models (e.g., Salmon, 2011) of how scaffolding could be used effectively in online learning environments. In this section, we briefly review the concept of Vygotsky's zone of proximal development, and its relationship to scaffolding, and review a few studies exploring online scaffolding in a variety of contexts.

Vygotsky's (1978) work with the *zone of proximal development* is often associated with scaffolding. The zone of proximal development (ZPD) refers to an individual's ability to do increasingly difficult work with assistance. According to Vygotsky (1978), ZPD is "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (p. 86). As the individual becomes more knowledgeable and/or experienced, the ZPD changes, allowing for continual growth and development. Scaffolding and ZPD helps to explain how information chunking enables the instructor to support students with deepening their skills and knowledge. For example, a beginner may need more scaffolding early on as s/he is at one end of the ZPD continuum. Over time, the beginner would become more knowledgeable and/or skilled, progressing along the ZPD continuum, and therefore would need less scaffolding.

A variety of scholars in different fields have explored the use of scaffolding in the learning process. For example, research has found that relevant and appropriate representations of a concept in one media form (e.g., pictures) can facilitate more rapid development of mental models when processing information in another form (e.g., text; see Eitel, Scheiter, Schüler, Nyström, Holmqvist, 2013). Researchers and instructional designers have thus sought to understand how to improve learning through more effective instructional scaffolding in cognitive, meta-cognitive, and social cognitive learning situations (Delen, Liew, & Willson, 2014).

This research has extended into online learning environments. Whipp and Lorentz (2009) explored the use of scaffolding within the context of three primarily online courses. The researchers were specifically exploring how to provide scaffolding in online environments. Several scaffolds for cognitive and social support were embedded during asynchronous discussions. Discussion threads were analyzed and end-of-semester interviews were conducted with three instructors and 21 students. Results indicated that cognitive support was provided primarily through messages of acknowledgement and praise, while social support was provided through messages including welcoming language and informal sharing. The data indicated that scaffolding was not implemented as consistently as possible across instructors. In terms of cognitive support, instructors demonstrated variation with questioning, direct instruction, and structure. In the area of social support, instructors varied in consistency of communication, interactions, and attention to group processes. The authors indicated a need to further support online instructors with scaffolding.

Ng, Cheung, and Hew (2010) also explored scaffolds in an asynchronous online learning environment. Their research investigated scaffolding as a strategy to improve solving ill-structured problems in a graduate master's program. All students in the study (N = 22) were experienced with asynchronous discussions. Specific scaffolds were provided to the experimental group to assist with labeling, as well as opening messages in the asynchronous discussions. Results did not indicate that scaffolding led to a difference in problem-solving processes between the experimental and control groups. The researchers concluded that there were challenges with the use of the scaffolds by the experimental group, leading to a need to improve message labels and message openers.

Salmon, Nie, and Edirishingha (2010) looked at scaffolding within a Second Life context. Salmon et al. designed "SL-tivities" to align with Salmon's (2011) five-stage model for scaffolding in an asynchronous learning environment—i.e., (a) access and motivation; (b) online socialization; (c) information exchange; (d) knowledge construction; and (e) development. A structured approach to scaffolding was followed with results indicating that "confidence in the environment and in each other builds up in a productive way" (p. 180). In particular, results from the study indicated that online socialization is a key scaffold that contributes positively to subsequent group learning.

Recently, studies related to scaffolding in OLE have focused on metacognitive scaffolding. Wesiak et al. (2014) explored metacognitive scaffolding for iterative augmentation during the development of a medical training simulator. Three phases of the simulator were explored in the study, ranging from the first version with metacognitive scaffolding to a final version with affective metacognitive scaffolding. Questionnaires (N = 106) and log data (N = 426) were analyzed to explore several factors including real-world relevance and self-regulated learning support. Results indicated that affective metacognitive scaffolding was useful for training simulators, resulting in increases in motivation and indications of success by participants.

Jumaat and Tasir (2016) studied the effectiveness of seven mechanisms of metacognitive scaffolding in an OLE. Thirty-seven master's students were involved in the online course in which discussions were facilitated via Facebook. Results indicate that four dominant mechanisms of metacognitive scaffolding were used by instructors, ranging from guiding the students to focus on their learning processes to providing the students with an instant feedback. A framework for scaffolding was presented focusing primarily on two metacognitive scaffolds: guiding students to focus on the learning process and reflective writing support. While more research is needed in this specific context, additional research could also focus on the use of the guidelines in a more traditional learning management system.

Motivation

According to Cole, Feild, and Harris (2004), learner motivation can influence the direction, focus, and level of effort learners expend on learning. Because of this, learner motivation can greatly mediate the effect of the cognitive demands inherent in learning. In other words, when cognitive load is high, a motivated student can still be successful, whereas an unmotivated student may find even scaffolded learning a chore. This can lead to motivation-caused differences in how humans process and interpret information (Cosmides & Tooby, 2013) and ultimately achieve academically (Mega, Ronconi, & De Beni, 2014). In fact, some believe that "motivation *is* information" (Anderson, 2014, p. 405), and thus is fundamental to understanding information processing. Other scholars have documented that motivation can affect information processing more directly, by fostering useful generative processing, for example (Mayer, 2014).

According to cognitive perspectives, motivation (classified as either extrinsic and intrinsic) involves initiating and sustaining a desirable behavior in accordance with defined goals (Driscoll, 2005; Schunk, 1990). Course requirements often serve as extrinsic motivation by establishing an external incentive to which the learner strives (Laszlo & Kupritz, 2003), while intrinsic motivation pertains to goals unique to the individual because of personal interests (Lim & Kim, 2003).

Both intrinsic motivation and extrinsic motivation are important for students' success in OLEs. Hartnett, George, and Dron (2011) used case-study methodology to explore the complex phenomenon of motivation in OLEs. The two cases they selected for their research were situated in a preservice teacher education program at a New Zealand tertiary institution. One case was a compulsory integrated science and technology course, and the other case was an introductory social studies curriculum course. Using a situational motivation scale as the measurement tool, thy found that in their two case studies, the perceived importance, relevance, and utility value (often associated with extrinsic motivation) are as important as the interest or enjoyment of the task (i.e., intrinsic motivation) for students' learning in OLEs. In another study, Bures, Amundsen, and Abrami (2002) examined student motivation and computer conferencing (CC) by observing 167 students in ten different courses using varying levels of computer conferencing technology and found that both intrinsic (personal task relevance and beliefs) and extrinsic elements (task attractiveness) predicted satisfaction. They further reported that students with a personal learning orientation (intrinsic motivation) participated more in CC activities, had higher grades, and benefited more from the CC environment.

In another study on goal orientations, Ng (2008) tested the hypothesis that learners with various types of multiple goals would have different learning patterns. Ng surveyed 1,200 undergraduate distance learners at the Open University of Hong Kong (797 responded) on their achievement goals, learning strategies, self-regulatory strategies, beliefs, and attitudes regarding their courses. Cluster analyses categorized participants into four types of learners: mastery-focused learners, multiple-goal learners with a work focus, multiple-goal learners with a performance focus, and multiple-goal learners with multiple foci. Multivariate analysis of variance (MANOVA) analyses indicated that students with these different goal orientations differed in their use of various learning and regulatory strategies (Wilks' $\lambda = .82$, $F[24,2138] = 6.19$, $p < .0001$, $\acute{\eta}^2 = .06$), motivational beliefs (Wilks'$\lambda = .88$, $F[6,1520] = 15.93$, $p < .0001$, $\acute{\eta}^2 = .06$), and course attitudes (Wilks'$\lambda = .68$, $F[6,1506] = 53.05$, $p < .0001$, $\acute{\eta}^2 = .17$). In other words, students with different goal orientations differed in how they learned online.

Researchers have suggested various ways to increase students' motivation in OLEs. For example, Huett, Kalinowski, Moller, and Huett (2008) studied the use of attention, relevance, confidence, and satisfaction (ARCS)-based emails to increase the motivation of undergraduate students in an online computer application course. Student participants in the treatment group received emails constructed according to Keller's ARCS model, including the following components: introduction, goal reminders, words of encouragement, and multiple points of contact. These researchers found statistically significant differences in motivation between the treatment group and the control group ($p < .001$), suggesting that well-designed communications can help increase students' motivation in online courses.

Emerging forms of technology can also increase motivation in OLEs (Mei-Mei, 2005). Hee Jun and Johnson (2005) reported a significant difference in learners' motivation for video-based instruction vs. text-based instruction. In their quasi-experimental, post-test-only study, 16 online master's students were provided both video- and text-based instruction within an online module, then asked for perceptions of understanding and motivation for each. Results indicated a significant difference for perceived learning and motivation, with participants reporting that the video-based instruction was more appealing and memorable. In another quasi-experimental study, Chaiprasurt and Esichaikuo (2013) compared motivation between learners ($N = 101$) in a Moodle course supported by mobile communication tools and those students ($N = 92$) in a regular Moodle course in an undergraduate program at a university in Thailand. They found that the use of mobile communication tools was useful in promoting online learners' motivation to engage in course activities. While Clark's (1994) cautions concerning novelty effects must be heeded, these findings suggested that online, context-based videos and mobile technologies may provide additional extrinsic motivation for students to engage online instruction.

Some research has indicated a connection between the type of feedback that students received and their ability to maintain their motivation. For example, Furnborough and Truman (2009) concluded in their qualitative study on the impact of students' perceived assignment feedback on their academic achievement that the more students perceived feedback as a formative learning support, the more likely they persisted to the next level. In cases when students considered feedback as a judgment on their progress, they were less motivated. This study suggests the importance of instructor's feedback on students' assignments in OLEs. Autonomy support has also been identified as important to motivate students to engage more in OLEs. Lee, Pate, and Cozart (2015) argued that autonomy support for students, which is built into course design, can be used as a strategy to enhance students' motivation and engagement in OLEs. Specifically, they offered three design guidelines of providing choice, rationale, and opportunity to help support and facilitate student autonomy.

Others, however, have suggested motivation may actually decline following online learning. For example, Schrum, Burbank, Engle, Chambers, and Glassett (2005) studied the motivation and beliefs of 22 higher education faculty from eight different colleges and universities enrolled in an online

professional development course. They concluded that difficulties sustaining the learning community and learning new technologies decreased learner morale. Schmeeckle (2003) also reported a significant negative impact on learner motivation in quantitative studies where trainees in the classroom group reported both higher motivation and more positive feelings about learning than did the online group.

A recent study by Roseth, Saltarelli, and Glass (2011) suggested that it may be the synchronicity and students' individualist perceptions that have a negative influence on students' motivation. Using the constructive controversy framework (a cooperative learning procedure designed to create intellectual conflict among students), they compared face-to-face and computer-mediated versions of constructive controversy among 118 undergraduate students in an introductory psychology class in a Midwestern university. The research employed a 1 (face-to-face: control) × 2 (synchronicity: synchronous, asynchronous) × 3 (medium: video, audio, text) between-subjects experimental-control design in their study. The correlational analyses suggested that individualist perceptions were negatively associated with motivation. The MANOVA suggested that compared to synchronous conditions, relatedness, interest, and value constructs of motivation all decreased under asynchronous conditions. These findings imply that the course design needs to consider the type of learning activities (group projects vs. individual projects) and synchronicity factors in order to help motivate students to actively engage in course activities.

Motivation is important for students' success in learning. Technology (e.g., videoconferencing, mobile technologies) plays an important role for students' motivation in OLEs. Consistent with general learning environment research, several more fundamental cognitive and design factors seem to influence student motivation (cf. Clark, 1994). Students' personal attributes such as goal orientation and self-regulation, and instructor's teaching strategies (e.g., ARCS-based emails and formative feedback) affect students' persistence in their online learning. While evidence-based strategies to help enhance student's motivation are encouraging, we need to attend to the research that indicates motivation may decline in some instances.

Metacognition

While not always clearly defined in most research studies (Dinsmore, Alexander, & Loughlin, 2008, reported only 32% of reviewed studies provided a definition), metacognition is nonetheless a popular and critical aspect of cognition theories of learning. Metacognition is traditionally defined as "thinking about how one thinks" (Winne, Hadwin, & Perry, 2013, p. 463), or one's awareness of, and ability to manage, one's own cognitive processes (Flavell, 1977) and involves the ability to anticipate, detect, and correct or "repair" understanding needs as they emerge (Schraw & Dennison, 1994). More recently, McCormick, Dimmit and Sullivan (2013) described metacognition as having two constructs: *knowledge* about one's own cognition and *control* over one's own cognition. Jacobs and Paris (1987) further described three types of metacognition: *declarative metacognition* (knowledge about cognition processes and influences), *procedural metacognition* (knowledge about how to implement effective learning strategies), and *conditional metacognition* (knowledge about when or why—the conditions—for metacognitive strategies). These forms of metacognition are then topics of debate about whether they are domain specific, or widely generalizable (McCormick et al., 2013; van der Stel & Veenman, 2014).

While definitions continue to be discussed, what seems clear is the critical role metacognition plays in learning performance, particularly as more learners are engaging in active learning environments (van der Stel & Veenman, 2014). Scholars argue that metacognition is additionally related to learners' self-efficacy and motivation (Moos, 2014), age (van der Stel & Veenman, 2014), learning environment (Azevedo, Behnagh, Duffy, Harley, & Trevors, 2012), and even social connections (Winne et al., 2013), and is a "required cognitive ability to achieve deep and meaningful learning"

(Garrison & Akyol, 2013, p. 84). Because of the high attrition rate in online learning often connected to low self-regulation (Sitzmann, 2012), scholars believe it is critical to understand how to improve metacognition in online learners. For example, Lee, Choi, and Kim (2013) examined the differences between persistent and dropout students enrolled in an undergraduate online course offered at the Korea National Open University. Using MANOVA to analyze the data collected from a survey instrument measuring student perception of time and study environment management, metacognitive self-regulation, academic self-efficacy, academic locus control, and support from family and work, they found that students' level of academic locus control and metacognitive self-regulation skills were the most significant factors influencing students' persistence in online courses.

Akyol and Garrison (2011) and Snyder and Dringus (2014) gave insights into why metacognition is particularly relevant online. Akyol and Garrison (2011) developed the metacognition construct based on the Community of Inquiry model (Garrison & Arbaugh, 2007) in that they positioned the metacognition construct at the intersection of cognitive presence and teaching presence. They argued that these two presences were essential in understanding students' metacognition in their online learning experiences. Snyderm and Dringus (2014) conducted a qualitative research study to explore where metacognition was evident in student-led online discussions and how students' experiences leading and participating in student-led online discussions related to their awareness of learning. The study took place in a graduate online course titled "Community of Practice" in a learning technology graduate program. Students' discussion postings in the online class and their responses to a Web-based questionnaire given at the end of the term were data sources for the study. The findings of this study indicated that metacognition, knowledge, monitoring, and regulation were all evident in students' online learning, and students used metacognitive processes to help them prepare and act in the role of facilitator for online discussions. This finding not only suggests that metacognition is relevant to student's online learning, but also implies that assigning students the role of facilitator may help promote their metacognitive awareness.

Metacognitive proficiency in OLEs may be related to ability and prior knowledge, or motivation for the learning material. Smidt and Hegelheimer (2004) conducted a qualitative study of nine adult English as a Second Language (ESL) learners on the use of Web-based video for a vocabulary and listening comprehension course. The researchers interviewed high-, middle-, and low-performing students regarding their learning strategies. Advanced learners exhibited both metacognitive and cognitive learning strategies, but intermediate and lower-level learners used mainly cognitive strategies, suggesting greater metacognitive awareness and utilization among advanced students. They also reported that males were more likely to use metacognitive strategies, while females used more cognitive strategies in their learning. However, a later study (Tsai, 2009) found no gender differences.

Research on gender differences in OLEs has continued to provide mixed findings. For example, Hoogerheide, Loyens, and van Gog (2016) studied gender differences in a secondary education science class that utilized video modeling examples (where a human model demonstrates and explains how to perform a learning task). The results of their study showed that male students reported higher self-efficacy. The study also indicated that compared to a female model, observing a male model enhanced perceived confidence from pre-test to post-test. While this research did not necessarily investigate on gender difference related to metacognition, it indicates the role that gender plays in students' learning in OLEs, which suggests the importance of continued research into gender difference in OLEs, especially because previous findings have been inconclusive.

Besides ability and prior knowledge, motivation has been identified to have a connection with students' metacognition. For example, Artino (2007) found in his study of 481 service academy undergraduates that students' perceptions about a course and their motivations for the material was related to their metacognition. Through logistic regressional analysis, Artino reported that students who completed an online course in aviation physiology, and who were planning to become aviators themselves, reported greater use of metacognitive strategies.

Land and Greene (2000) found that metacognitive knowledge can sometimes compensate for limited system or domain knowledge. Similarly, Conrad (2009) found in her qualitative study of six online learners that strong metacognitive skills were essential in helping students compensate for needing to be absent from their online course for an extended period. For example, metacognitive strategies such as note-taking or tagging have been found to be helpful for students' learning in OLEs. In a study of 119 undergraduate students in educational psychology and child development courses, Kaufman (2004) asked online learners to take notes using either a freeform method or strategically with the aid of a matrix. While taking notes, some students received prompts to reflect on their learning and note-taking. Students who received metacognitive prompts and took notes using a matrix performed significantly better on post-experiment achievement tests; significantly, only three prompts per hour of note-taking yielded this improvement.

Similarly, in Bannert's (2003) study of 40 university students wherein the experimental group was prompted only three times to review their learning, those who received prompts performed better on post-experiment performance assessments. In a recent study, Adesope, Zhou, and Nesbit (2015) investigated whether motivation influences learning strategies and whether learning strategies include students' studying behaviors in an online environment. The research was conducted in an online introductory psychology class with 181 participants. This 13-week course consisted of textbook readings through an online gStudy tool, which allows the students to create notes or definitions linked to text, and tag text content. The results of the study indicated that the use of notes and tags was strongly correlated with students' intrinsic motivation and task value, which in turn impacted how much effort students were likely to expend. These findings suggest that seemingly modest attempts to scaffold metacognition in OLEs can improve learning—especially for students who attempt to be strategic during their learning.

The Web, with its connecting nodes of information, has been characterized as a metaphor for human cognition (Mayer-Kress & Barczys, 1995); accordingly, OLEs might support the mapping and enactment of metacognitive scaffolding. Using a neural network model, Yeh and Lo (2005) developed a system for assessing students' metacognitive knowledge based on their Web browsing abilities. They assigned 146 students enrolled in a freshman English course to a Web-based learning activity. Before and following the activity, the researchers administered a metacognitive awareness inventory comprising 52 self-report items, thus allowing for self-reports to be compared with the system's assessment. The researchers reported that their system accurately assessed metacognitive knowledge, which could potentially benefit students with language barriers or limitations, such as those learning language online, who might experience difficulties reporting their metacognitive knowledge through typical questionnaires. Though these findings have not yet been widely replicated, the capacity to identify and address metacognitive knowledge needs may prove helpful in mitigating problems associated with limited prior domain and system knowledge.

Because of the importance of metacognition for successful online learning, many scholars have investigated additional methods for assessing students' metacognitive abilities online (Pimentel & Omar, 2008). Tsai (2009) revised an earlier version of the Online Learning Strategies Scale (Tsai, 2007) for evaluating student online learning strategies, including their metacognitive strategies. The metacognitive portion of Tsai's 20-item instrument included four items, with a reliability alpha of .67—the lowest of all subscales in the instrument, though still considered acceptable, indicating perhaps that metacognition can be assessed through a self-report instrument, but with lingering reliability challenges.

Metacognition is an important construct for students' success in OLEs, and it helps students persist in their online learning experiences. Several factors have been found to be related to students' metacognition, such as prior knowledge and motivation. Research has identified various metacognitive strategies that have a positive impact on students' metacognition in OLEs such as assigning students the role of facilitator of online discussions, and note-taking or tagging. It's interesting to

note that metacognition interacts with other constructs such as motivation (Artino, 2007) and prior knowledge (Smidt & Hegelheimer, 2004). Future research needs to look at how the interaction among those constructs impacts students' learning experiences in OLEs.

Implications for Online Learning Research, Theory, and Practice

Research related to cognitive perspectives has several important implications for OLEs. Scholars have underscored the need to assess and balance how cognitive resources are allocated. While the findings appear obvious, we rarely design or evaluate online learning environments based on cognitive processing requirements. Often, OLEs provide extensive sets of links, supplementary information, and tools presumed to support cognitive processing, but these are not always as effective as desired. Many structural organizers and scaffolds that are found helpful in text-based learning research, in addition to learners' self-efficacy, have also proven valuable in mitigating extraneous load during online learning. Given wide variations in how online learning environments are organized and supported, the need to simultaneously maximize germane load and minimize extraneous load requires particular attention in OLE research and design.

The study of scaffolding cognitive processing in online environments, particularly with Web 2.0 technologies and mobile technologies, is still at an exploratory stage. While some research has noted results that have assisted learners, others have indicated a need for continued exploration. In addition, online socialization seems to be a key scaffold for positive group learning. As more learning shifts to online contexts, continuing to build our understanding of how scaffolding can contribute to the success of online learners is critical.

It is apparent that motivational factors are as critical for online as they are for other learning environments. Importantly, both intrinsic and extrinsic aspects of motivation can be addressed in well-crafted OLEs. The initial—and, to some extent, continuing—assumption that technology provides inherent motivational benefits has been widely debunked. Individuals hold different values, draw from diverse backgrounds and experiences, and vary in their goals and expectations, but students with more intrinsic motivation seem more likely to participate and achieve higher grades. Identifying individual differences across learners may well increase our capacity to accommodate diverse learner needs. Likewise, the affordances—available features, structures, and supports—will influence the extrinsic motivation potential of an OLE. In addition, feedback as a formative learning support, instead of as a summative performance judgment, increases persistence. Research clearly indicates that extrinsically mediated motivation to engage and succeed increases as technical and navigation requirements decrease.

Finally, while metacognition principles are perhaps the most intuitively relevant among OLE researchers, theorists, and practitioners, they are also among the least employed. Virtually all learning involves metacognitive regulation to some degree, but the cognitive demands associated with online learning can be especially formidable. For example, it appears that metacognitive skills are among the most significant factors influencing students' persistence (Lee et al., 2013) and are particularly important for helping students compensate for needing to be absent from an online class. Since metacognitive knowledge and skill are highly correlated with prior domain knowledge, and online learners often do not have extensive domain knowledge, they are often forced to make metacognitive judgments for which they are ill prepared. Research described earlier in this chapter has indicated that online learners benefit from even small attempts at metacognitive scaffolding. Continuing to research how best to provide these supports could improve the online learning process.

Cognitive information processing is just one theoretical lens for understanding online learning, and other theories, including socio-cultural perspectives, are also relevant in understanding how to improve student learning. While there are multiple theoretical viewpoints that provide value, the most important recommendation is for scholars and instructional designers to employ theory in

some form to guide their development of online learning. Being theoretically guided can help us make conscientious decisions that maximize the efficiency and effectiveness of our online learning environments.

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9

DISTANCE LEARNING AND STUDENT SATISFACTION

Mike Allen, Kikuko Omori, Andrew W. Cole, and Nancy Burrell

Two concerns about employing distance learning techniques dominated early discussions: (a) whether distance learning techniques could provide equivalent learning outcomes compared to face-to-face (f2f) instruction; and (b) whether students would express comparable satisfaction with distance learning techniques. After addressing those questions in the affirmative, the past 20 years has seen attention turn toward understanding and improving distance learning. Specifically, fully online courses (in which 100% of the learning activities take place using the Internet) and blended or hybrid courses (that mix f2f and online components) received much attention by researchers, administrators, and the mainstream media. Though, of late, the phrases "distance education," or "distance teaching and learning," and "online education," or "online teaching and learning," often become used interchangeably, and distance education offerings may make extensive use of communication technology or may use very little, if any, information and communication technologies (ICT). Though the terms distance education and online education are not, by nature, identical, the majority of distance teaching and learning practices occurring within the higher educational setting at this point in time involve some use of the Internet, and the World Wide Web (WWW).

Much distance education research involves two different aspects: (a) articulating and describing the techniques employed; and (b) evaluating elements of the process. The descriptive literature involves discussion and exposition of syllabi, and an understanding of the technology employed. Additionally, interactional aspects such as instructor-student communication frequency and quality receives much detail and exposition. Unlike typical f2f instruction, the available technology and means of interaction between instructors and students in distance education, as well as between students, varies a great deal, and could potentially involve no direct two-way simultaneous communication. Additionally, unlike typical f2f instruction, the available communication technologies and methods of interaction (e.g., email, social media) vary a great deal. The dynamic nature of communication approaches employed in distance education means that the evaluation of distance learning techniques constantly evolves as new technological applications emerge (Allen, Burrell, Bourhis, Timmerman, & Mabry, et al., 2007, Allen, Omori, Burrell, Mabry, & Timmerman et al., 2013).

A large number of meta-analyses exist examining differences between distance education and f2f communication on the basis of learning outcomes, such as student satisfaction (Allen et al., 2004; Bernard et al., 2004; Bernard et al., 2009; Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2012). When taken as a whole, these meta-analyses suggest that generally little difference exists between student learning and satisfaction across modalities. The "no significant differences" conclusion reached by these meta-analyses should not mean that all forms of f2f instruction are equivalent, in terms of

quality and effectiveness, to all forms of distance education. Instead, researchers and teachers alike should recognize that distance education offerings, including online courses, vary in effectiveness and student satisfaction, in the same manner as in f2f instruction (Cavanaugh, 2001; Cook, Levinson, & Garside, 2010, Cook, Levinson, Garside, Dupras, et al., 2010).

This chapter begins by discussing the use of meta-analysis as a means to provide evidence for decision making concerning student satisfaction in the domain of distance education. Discussion then moves toward describing distance education as a learning environment, and evaluating student satisfaction within a variety of distance learning contexts. Alternative, and emerging, methods of distance learning are then detailed, with specific attention paid to opportunities and challenges presented by these new applications.

Using Meta-Analysis as Evidence for Decision Making

Meta-analysis provides a mechanism to accumulate existing research by creating averages across domains of empirical literature. The weighted average generated by a meta-analysis, whether using sample or variance weighting procedures, provides an average that creates a more accurate picture of the existing relationships between constructs of interest (Hunter & Schmidt, 2014).

Meta-analysis permits the assessment of how various moderating features (e.g., study design characteristics, sample characteristics, educational environmental issues) can account for variability in study outcomes. Allen (2009) indicates that a primary use of the technique becomes the assessment (using either random or fixed models) of the various sources of variability across a set of findings. When issues like the content of the course (natural science, social science, humanities, etc.,) as well as the type of institution (private, public, religious, etc.,) or student factors (age, ethnicity, prior distance learning experience, etc.) become considered, an understanding of the contribution of the complexity of the educational environment becomes possible.

The other potential of meta-analysis provides for the testing and evaluation of theoretical systems using various statistical modeling tests (Allen et al., 2014; Salazar, Gonzalez, Duysters, Sabidussi, & Allen, 2016; Turkiewicz, Allen, Venetis, & Robinson, 2014). The potential exists to evaluate entire theoretical systems across entire domains of data. The implications for the assessment of various educational programs involve the assessment of underlying theoretical processes at work in learning.

Describing the Distance Learning Environment and Satisfaction

As findings from meta-analyses appear to suggest little difference in student outcomes across distance and f2f settings (Allen et al., 2002), the issue of satisfaction may seem less immediately important than learning. However, concerns about satisfaction in distance education often intertwine with concerns about student retention. The underlying issues of student retention indicate data consistent with the arguments of Tinto, 1975, 1982, 1993, 2004) that the ability of a student to create a connection with the institution improves retention. Students that rarely, or never, physically appear on a college campus lack numerous opportunities to create a connection with the campus community around them. The higher attrition rates documented when comparing distant education courses than traditional f2f courses hardly surprise anyone (Angelino, Williams, & Natvig, 2007; McLaren, 2004; Simpson, 2013). Nistor and Neubauer (2010) argue that the participation patterns of the students failing to complete significantly differ from retained students in distance education. As non-retained students sent fewer and shorter messages than retained students in an online course setting (Nistor & Neubauer, 2010), there appear to exist potential, identifiable predictors to attrition in distance education settings that may relate to satisfaction with the modality, to a greater extent than course content, or any specific learning opportunities present in the environment.

Distance education provides a wide variety of options and potential in terms of course structure. Learning environments for distance education offerings may operate in real time (e.g., using synchronous communication technologies), such as through a webcam or closed-circuit television system. Conversely, a distance education learning environment may operate largely punctuated by gaps in time between communications (e.g., using asynchronous communication methods), as is common in the discussion forums utilized in many online courses. The simplest, and perhaps oldest, method of distance learning was the correspondence course (see Pittman, 2013), wherein all instruction, learning activities, assessments, and communication took place in hard copy, using the U.S. mail service. Later, the use of educational television (Rosenberg, 2001) permitted a unidirectional communication format that could be further supplemented with synchronous or asynchronous telephone communication.

The modern era of distance learning largely came into being once computers and the Web made communicating course content at a distance more accessible. Though the implementation of computers into physical classrooms may not have directly changed the educational landscape to the extent that many predicted (Cuban, 2001), access to personal computers and the Web at home made distance education more appealing to many instructors and students. As the technologies used to facilitate courses using the Internet continue to develop, the advanced software programs created for the educational context (e.g., Course Management Systems [CMS] and Learning Management Systems [LMS]) increase the ability to transmit huge amounts of information quickly and efficiently. The many barriers to a quality computer-mediated education (including the file size of audiovisual materials and lack of direct, real-time communication) continue to diminish, and may even become irrelevant, over time. High-speed communication mechanisms permit more flexibility and a greater range of options for the instructor considering course delivery alternatives.

The ever-dynamic and emergent set of technological advances in terms of communication and education also represents a problem with understanding and representing the distance learning environment. Unlike the traditional f2f class, the structure and process of which largely remains unchanged from antiquity, the distance learning environment continues to evolve and change. Technological systems such as Group Decision Support Systems (GDSS) developed and gained some attention from educators, but ultimately came and went in a relative flash, replaced by new and better technology. Rapid changes in communication technology and education can also be seen in the growth of mobile learning, or mlearning. Ten years ago, the idea of a smartphone application or an educational application for a tablet in the classroom would not have been considered possible, as few students owned mobile phones with Internet capabilities. Recent studies on smartphone use (Smith, 2015), however, suggest that some demographics are now "smartphone-dependent," accessing the Internet primarily—or even exclusively—through mobile phones. Such developments require distance education researchers and practitioners to constantly re-evaluate and update their approaches. The continued emergence and development of both applications and hardware capabilities continues.

Though the technologies used to facilitate distance education are important, the needs of students form the basis of distance educational practices. In order to meet identity needs, a student should find validation or confirmation in some aspect of what the institution provides in terms of mentorship, content, or ability to reach goals. At the heart of all these elements is the feedback provided by the institution to the student that confirms or validates some important aspect of identity. Gaskell (2009) emphasized the importance of providing proactive student support. Johnson, Aragon, Shaik, and Palma-Rivas (2000) compared a graduate online course with an equivalent f2f course regarding quality of instructors and courses, interaction, and learning outcomes. While there was no significant difference in students' learning outcomes between the two different forms of teaching, the f2f students perceived the quality of the instructor and the course more positively than the online students. Also, the f2f students perceived more student-student and student-instructor interactions than the online course students. In the f2f classroom, students and the instructors can socialize during breaks

and perhaps more easily foster a relationship. However, for online courses, opportunities for relationship development are more limited without places and times to discuss unrelated topics with other classmates and the instructors.

Creating a way for socialization in distance education may represent a key for student satisfaction. Online instruction operates in an environment typically with a reduced level of communication bandwidth and opportunity. Communication can become less personal and may lack as many of the socially supportive elements that would be typically found in a f2f environment. A lot of phatic, or non-task, personal communication may not occur as frequently in an online environment. That is not to say, however, that personal communication is irrelevant in the online course setting, or that improving communication in the online course context will not impact student satisfaction levels. Some research supports the notion that students' communication satisfaction with online instructors strongly predicts their satisfaction with the online course, even if the students generally appear to prefer f2f communication and courses (Cole, 2016). Further, the way that students perceive their relationships with online instructors may influence whether they report an intent to take another online course, and recommend online courses to friends (Cole, Kim, & Priddis, 2015). Therefore, the focus should perhaps move from whether online communication and courses can be satisfying to students, to how to maximize students' satisfaction with online communication and courses.

Understanding Student Satisfaction in the Distance Learning Environment

As mentioned earlier, one evolving issue in distance education concerns increasing student satisfaction with online courses. Distance education involves a number of choices that involve not just underlying technologies, but also the pedagogical choices that an instructor makes based on the learning outcomes sought. Most current distance education employs some form of technology, and the first split in methods becomes the degree of synchronous communication. The structure of the communication format indicates something that an instructor must thoughtfully plan about the course. A number of possibilities and options exist that permit an instructor to decide how best to structure the environment that increases the student's ability to complete tasks, and be satisfied with the results.

One set of questions involves how components of traditional f2f courses, such as instructor feedback, instructions, ability to adapt based on student feedback, and course structure, can translate to an asynchronous environment. For example, a fully (100%) Web-based course often requires use of a learning management system (LMS) or course management system (CMS) platform (e.g., D2L or Blackboard). These platforms can allow students to access course material at times most convenient for them. Most instruction thus occurs asynchronously using various means, such as assignment "folders" or "dropboxes," and threaded discussion forums. Many massive open online courses, or "MOOCs"—courses enrolling potentially thousands of students that will be detailed later in this chapter—operate at a very large scale, primarily utilizing an asynchronous communication model. In asynchronous settings, student satisfaction may relate more to the ease of the format and the flexibility provided by a course that is accessible 24 hours a day and provides for more flexibility in terms of participation. The lack of traditional f2f course structure becomes easier to permit when no specific time is set aside for synchronous instructor-student communication.

When no synchronous communication takes place, the ability of an instructor to look at an audience and react to nonverbal reactions indicating understanding—or lack thereof—by students does not take place. Under conditions whereby communication appears as a unidimensional or one-way transmission, such as is often the case in asynchronous-based online course offerings, effort is required to change perception of the learning from an inactive process, like simply watching a video online or having PowerPoint slides read out loud, into a more interactive process as students

exchange thoughts, discuss questions, and offer explanations based on their understandings of the course material. The ability of an instructor to create the perception of adequate communication that permits a student to prepare and succeed represents the most fundamental expectation that a student may possess about a class. Further, students' satisfaction with their interactions with the instructor, and other students, may predict greater course satisfaction, even online (Cole, 2016).

The use of synchronous communication means, like a webcam or other simultaneous broadcast signal, reduces the flexibility of participation and exposure/consumption of course materials in distance course offerings. The nature of some courses, like the teaching of foreign language through conversation with a foreign national in a native language, necessarily requires commitment to particular days, and specific times, when all students must access the course content to permit the exercises to proceed. Though flexibility of time is perhaps one of the most attractive aspects of distance teaching and learning for many instructors and students, the importance of providing more structure may benefit some students.

Depending on the course structure and format, instructor feedback may or may not be synchronous. The issues of providing feedback in a distance education format, such as in an online course, are fundamentally not different from f2f formats, but may require more careful consideration. Student satisfaction requires that when a student participates, asks a question, or sends a completed assignment, the instructor sends back some information dealing with assessment and evaluation. The adequacy of instructions and ability to understand the tasks required for course completion requires some ability to answer questions completely and promptly. The ability to have multiple means of communication available for issues of clarification becomes important, as well as working on assignments, and access to necessary material prior to distribution becomes important. The constant updating and changing to reflect understanding (or misunderstanding) of course information plays a central, if not vital, role for most distance learning formats.

Similarly, students' participation may affect satisfaction. More interaction with others increases a feeling of community, often referred to as "social presence" (Tu & McIsaac, 2002). Without class participation, students are invisible in distance education. Students' class satisfaction may also relate to feelings of isolation. The feeling of physical and psychological isolation from others is called lack of social presence (Biocca, 1997). Han and Hill (2007) found that a welcoming atmosphere facilitates students to engage in the discussion. At the same time, engaging discussion should enhance students' feeling of social presence.

Facilitating social presence, as a means of fostering student satisfaction, may require different approaches based on the nature of the course material. Bente, Sabine, Nicole, and Felix's (2008) research about presence and media modernity found that audio, video, and avatar-mediated communication significantly increased users' general satisfaction with interaction outcomes, the feeling of being co-present, and the experience of emotional closeness as a relevant dimension of social presence, as well as the affective component of interpersonal trust vs. text-based chat. On the other hand, Traphangan et al. (2010) compared a three-dimensional virtual world environment (Second Life) and a text-chat learning environment (TeachNet). Even though the virtual world environment was believed to enhance social presence, the result shows the participants of the text-only chat made a higher level of cognitive engagement. The participants in Traphangan et al. (2010) commented that the visual aids in the second life distracted them from cognitive engagement with the discussion. Though social presence may be an important factor in student satisfaction in distance education, the particulars of a given modality may challenge straightforward seeming approaches to generating presence (Phipps, 2013; Picciano, 2002).

Early research into the use of computer-mediated communication in online courses suggested that the modality could facilitate participation from quiet students by forming a more democratic environment (McComb, 1994). Reduced nonverbal cues in distance education were thought to help reduce the impact of gender, age, and ethnicity differences. As such, students could focus on

the message itself without the influence of "physical presence, personality, accent, or body language" (Merryfield, 2003, p. 150). Online courses are further able to create "real" intercultural communication in class, and facilitate international students' class participation. For example, unlike in f2f classroom settings, there were no significant differences in the frequency and the length of the postings between Asian-based or European-based university student groups in Russia (Yang, Olesova, &Richardson, 2010). Similarly, Zhao and McDougall (2008) report that the asynchronous feature of online courses helps international students suppress the psychological pressure of using a foreign language. Some international students preferred online courses, because the online courses do not require speaking/listening ability (Zhao & McDougall, 2008).

While flexibility and 24-hour access to class materials and participation opportunities are generally seen as favorable aspects of online courses, one common complaint is the time required for the class. In order to participate in class discussions regularly, students must keep connected to an online course site to a greater extent than a physical f2f classroom that they may attend only a few times a week. However, while students feel they spend longer hours for online course "attendance," Brown and Green (2009) report the average time—calculated by creating a total for the number of words in the discussion and the average reading speed of a student—that students spent reading the threaded discussion only 64.69 minutes per week. If such an average is accurate for online college level, three-credit courses, students might spend less "attending" hours than the traditional three hours typical in f2f classes. Therefore, something other than attending hours might influence students' perceptions of time commitment to online courses.

In distance education, keeping students' motivation level high is harder than traditional f2f courses because learners often feel isolated (Keller & Suzuki, 2004), which may in turn discourage their participation and satisfaction. Further, online communication apprehension (Ledbetter & Finn, 2013; Scott & Timmerman, 2005) could potentially represent a new type of constraint on student interactions when using technologies for educational purposes. Such findings support the notion that as distance education course offerings and the technologies utilized evolve, the experiences of students in these course offerings change, as well (Richardson & Ice, 2010). While motivation is like an engine for students to engage and seek success in the class, motivation is not a singular entity but complicated construct. Keller (1983) claimed that attention, relevance, confidence, and satisfaction (ARCS) construct motivation. Attention refers to the curiosity, relevance refers to the meaningfulness of the content, confidence refers to efficacy, and satisfaction refers to the positive feelings students have. Thus, when students perceive the class as interesting and relevant to them, they are willing to learn more. On the other hand, when students perceive the class as boring and difficult, they are less satisfied with the class, and in turn it decreases their' motivation. A challenge for distance education becomes going beyond the content material, and creating the social elements of learning.

Alternative Formats of Distance Learning Environment

As distance education continues to evolve, alternative pedagogical opportunities arise, as well. This section briefly details three current areas of interest in distance education—MOOCs, mobile learning, and international classroom partnerships—with attention toward opportunities for student satisfaction offered by these tech.nologies/modalities.

Massive Open Online Courses (MOOCs)

Massive open online courses (MOOCs) reflect an amalgam of various distance learning and online learning characteristics. Though different labels can be attached to different types of MOOC, generally the content and facilitation of a MOOC has been either instructor-driven (xMOOCs), or primarily student-driven (the constructivist or cMOOCs). In xMOOCs, an instructor provides

material, and even assessments, while students have little opportunity to influence the course. Conversely, in cMOOCs, the students largely guide the course. For that reason, to a certain extent, cMOOCs can alleviate the concern about whether an instructor can successfully interact with a class of potentially thousands of students, as student-student interaction becomes more important than instructor-student interaction. However, both xMOOCs and cMOOCs have been questioned from an instructional design perspective (Margaryan, Bianco, & Littlejohn, 2015). Satisfaction with a MOOC, however, may be conceptualized beyond the measures traditionally used to assess satisfaction in traditional f2f courses or in previously extant online credit courses.

One thing that separates MOOCs from online credit courses, to date, is that generally MOOC students enroll in a MOOC for the purposes of lifelong learning rather than to earn a degree or credential (Ossiannilsson, Altinay, & Altinay, 2016). In a study of college students currently enrolled in more traditionally structured course offerings, many students reported that they felt MOOCs could be useful for lifelong learning but largely lacked the quality of traditional college course offerings, as signified by leading to college credits and degree completion (Cole & Timmerman, 2015). That does not mean, however, that MOOCs cannot offer anything in terms of incentives. Gamification techniques, such as the use of "badges" (Chang & Wei, 2016) have been introduced to MOOCs as a means to increase student participation and completion.

Though seemingly contrary to many online "best practices," if MOOC students enroll in MOOCs primarily for the purposes of lifelong learning, certain areas important to student satisfaction in other applications, such as instructor-student interaction, may not be as important in the MOOC environment. In an examination of users from three commercial MOOC websites, Alraimi, Zo, and Ciganek (2015) found that satisfaction appeared largely linked to whether users found the course to be "fun," as well as whether the course derived from a prestigious institution. In this way, MOOC student satisfaction could relate more to the content of the course, the flexibility of the format, and the instructor/institution rather than whether they have ample communication opportunities with instructors and peers. A rigid course structure in a MOOC that forces students to complete tasks and interact with others on a time schedule could actually prevent students from engaging with the material, and perhaps even enrolling in the course, as the open access and availability whenever the student wants to engage the material is potentially one of the biggest benefits of the MOOC concept.

As with the more traditional for-credit online course offerings, attrition has been a documented issue in MOOCs. Some evidence suggests that completion rates in MOOCs are substantially lower than traditional online courses (Koller, Ng, Do, & Chen, 2013). Some research has supported the idea that a credential, such as a certificate, can increase course completion (Greene, Oswald, & Pomerantz, 2015). Further research into MOOCs can continue to assess how satisfaction may present differently within a MOOC. If individuals enroll in MOOCs primarily for the purposes of lifelong learning, instructional design elements that enhance learning—but not necessarily satisfaction—in traditional online courses, such as working on group projects or reviewing a peer's work, may decrease MOOC student satisfaction.

Mobile Learning (mlearning)

Some institutions have started modifying course offerings using a mobile learning format. Mobile learning is defined as "the use of mobile or wireless devices for the purpose of learning while on the move" (Park, 2011, p. 79). Many college students bring mobile devices such as smartphones and tablets with them to class. The benefit of using the hypermobile devices is not limited to the accessibility, but also the ease in uploading media, such as pictures and movies while using the devices (Bayne, 2010). By using mobile devices, students can share their opinions, and that could enhance students' satisfaction in f2f courses. Abilene Christian University started implementing

mobile learning from 2008, and 92% of students provided positive feedback to the mobile learning program (Bayne, 2010).

International Classroom Partnerships

The number of international classroom partnerships are growing as the number of international partnerships among institutions has increased over the years. According to the American Council on Education (2012), 45% of the institutions offered one or more international collaborative programs (joint degrees, dual degrees, and/or certificates), or were in the process of developing such programs, arranged with non-U.S. institutions overseas. Distance education is commonly used in international collaborative programs such as taking some classes that are originally developed at the partner institution. While distance education provided students with a chance to take courses overseas while they are still at their home countries, language proficiency, technological availability, and cultural differences add to the complexity on student satisfaction (American Council on Education, 2012).

Discussion

The generalized set of conclusions operates at the more global level when dealing with issues of student satisfaction. The generalized conclusion provides a basis for making an argument that distance teaching and learning provides the opportunity for student success that provides the conditions for the same level of satisfaction as in f2f classroom settings. What is not quite clear at this point are the particular mechanisms or procedures that work well in the f2f classroom and their translation to different applications in the online environment; for example, the use of humor, questions, nonverbal and verbal immediacy, advanced organizers, and other features of the f2f classroom connected to satisfaction with the classroom interaction. The understanding of the equivalent functions in the distance learning environment and how an instructor can increase satisfaction requires additional research.

The continued focus of research on the examination of strategies may prove problematic if related to the particulars of a technology. The problem is understanding the nature of the term "best practices" as applied to distance education. While particular practices are offered about how to improve learning and the reaction of students, unfortunately many of the practices generate excellent descriptions—complete with full advice and accompanying materials to permit implementation of the strategy—but lack substantial and systematic reports of evaluation. The challenge for understanding satisfaction in distance education is in conducting a more fundamental evaluation of how the elements of the process of learning impact the outcomes of interest (like affective learning).

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10

INSTRUCTIONAL STRATEGIES TO SUPPORT STUDENT PERSISTENCE

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Learners often choose online learning because they may select a school or program that fits their educational goals rather than choosing one based on the best options available in their geographic area. However, online learners must overcome many challenges to persist and successfully achieve their goals. *Persistence* refers to learners' actions to continue their education from the first year until degree completion. Evidence suggests that dropout rates among distance learners are higher than traditional, campus-based learners (Allen & Seaman, 2013). Therefore, it is critical to understand the factors that contribute to learners dropping out and develop effective strategies to support learners' persistence. In this chapter, we review persistence models appropriate for the online learner population to provide the foundation for understanding important academic factors that impact learner persistence. Then, we consider how building a community of inquiry and providing appropriate scaffolding to support online learners can help them to achieve their educational goals.

Persistence Models

Persistence models provide valuable insight into important variables to consider when developing online courses. William Spady, Vincent Tinto, and Ernest Pascarella are three prominent researchers who studied learner persistence and retention. Their models address the traditional student in a land-based institution. When studying persistence of typical online learners who are considered nontraditional student, who work full time, live away from campus, have families, and belong to social groups not associated with their college, the question arises whether persistence models such as those of Spady (1970), Tinto (1975), and Pascarella (1985) hold true for this population. Bean and Metzner's (1985) persistence model and the Rovai (2003) model of persistence, on the other hand, specifically address distance learning students.

Bean and Metzner (1985) identified students over the age of 24 as a common variable of learner attrition. These learners commonly work full time and have family responsibilities that prevent them from attending school full time and affect their ability to persist. They proposed a model grounded on Tinto's (1975) model of persistence and earlier psychological models to explain attrition of nontraditional students. Their model predicts student persistence. Factors that affect persistence include academic variables such as study habits, course availability, and background including age, ethnicity, educational goals, and prior GPA. Environmental variables include finances, hours of employment, family responsibilities, and outside encouragement. Finally, psychological variables such as stress,

self-confidence, and motivation can impact learners' ability to successfully complete a program of study online.

Rovai (2003) evaluated several persistence models relevant to nontraditional learners and developed a composite model to explain persistence of online learners. His model includes learner characteristics and skills prior to admission and external and internal factors after admission.

He integrates Bean and Metzner's (1985) learner characteristics prior to admission including age, ethnicity, gender, intellectual development, academic performance, and preparation. He also includes skills distance learners require to successfully navigate the online environment, including computer literacy, information literacy, time management, reading and writing skills, and online interaction skills. He argues that if learners lack these skills and do not overcome these deficiencies, it can lead to attrition.

Once learners begin a program of study, additional factors both external and internal to the institution affect learners' persistence. According to Rovai (2003), external factors include issues with finances, hours of employment, family responsibilities, the presence of outside encouragement, opportunity to transfer, and life crises such as sickness, divorce, and job loss. He also incorporates internal factors including variables researched by Tinto (1975), Bean and Metzner (1985), Workman and Stenard (1996), and Kerka and Grow (1996, as cited in Rovai, 2003).

According to Tinto (1975), social and academic integration, goal commitment, institutional commitment, and the development of a learning community are internal institutional factors affecting persistence. Workman and Stenard (1996), found online needs include consistency and clarity of online programs, policies, and procedures, strong self-esteem, identifying with the institution and not feeling like an "outsider," developing interpersonal relationships with peers, faculty, and staff, and accessing academic support and services. Tinto (2012) has developed a framework for institutional action to help students persist and graduate. The framework includes setting clear expectations for student success; providing academic support, especially in the first year of study; providing opportunities for continuous assessment and feedback; and providing opportunities for student involvement and engagement. According to Tinto, when all four of these conditions are present, students are more likely to persist and thereby succeed.

Braxton et al. (2014) studied the persistence of students who attend commuter colleges and universities, which tend to have higher numbers of nontraditional students. Their model includes many of the same elements as the others. Considerations include the students' entry characteristics, which include their motivation to attend college, need for autonomy or control, self-efficacy, level of empathy, need for social affiliation, family educational level, and pre-matriculation socialization. Their model also considers the external environment and students' personal responsibilities and obligations, which have an impact on their ability to persist.

A predictive model to explain persistence is critical to understand how to support online learners. A key theme in the persistence literature is the need for learners to be able to integrate academically and socially—the greater the level of academic and social integration, the greater chance students will persist in a program of study. Developing presence online can provide a structure for social integration and cognitive scaffolding can support academic integration. First, we take a look at developing presence.

Developing Presence in the Online Environment

The development of presence in the online environment is essential for learning to occur and for learners to persist (Tinto, 1975; Bean & Metzner, 1985; Rovai, 2003; Workman & Stenard, 1996; Braxton et al., 2014). Garrison, Anderson, and Archer's (2000) community of inquiry model provides a framework for integrating social, cognitive, and teaching presence to support learners' persistence online. Because you have already been introduced to the community of inquiry model, the following

serves as a brief review. Social presence includes the affective dimension of feelings, beliefs, and values, as well as the need for open communication and group cohesion. Cognitive presence supports the construction of meaning through sustained discourse and reflection. Teaching presence includes the design and organization of the online environment, as well as the facilitation of discourse and direct instruction. The structure of the online learning environment should consider the interaction of social, cognitive, and teaching presence. These dimensions of presence can help us understand important factors to consider in the design, organization, and facilitation of an online course to increase the probability of learners persisting from course to course to complete a program of study.

Interaction is related to student perception of presence, which is a predictor of student satisfaction in computer-mediated environments (Picciano, 2002; Kuo, Walker, Belland, & Schroder, 2013). Thomas, Herbert, and Teras (2014) explored experiences of students from nontraditional backgrounds who engaged in online learning and found that experiencing a sense of belonging and personal connection was an important part of the students' learning experience. Students reported that greater engagement and collaboration with peers fostered a sense of camaraderie and diffused some of their feelings of isolation. Garrison and Cleveland-Innes (2004) found that interaction, both socially and cognitively, presented the greatest student adjustment challenge to online learning. Interestingly, their study established that peer interaction shaped social presence more heavily than instructor interaction. Teaching presence in the form of facilitation, however, was crucial to successful higher-order learning.

Social Presence

Social presence establishes learners as individuals and, through the process of relationship building, allows learners to engage in a community of inquiry (Garrison et al., 2000). The more learners establish themselves with other learners and the instructor, the more trust they build. Trust helps learners feel comfortable with sharing their thoughts and ideas without the fear of criticism. As the level of interaction increases, a greater sense of community can occur where learners share their divergent thoughts and perspectives to construct knowledge and understanding.

Horzum (2015) studied the relationship between interaction, social presence, and satisfaction, and found that online social presence was positively influenced by level of interaction. The study also demonstrated that students were more satisfied when there was a high level of social presence in the online environment. A study of the effects of small group discussions on social presence, found that when students were placed in small groups vs. whole-class discussions, students perceived a higher level of social presence in terms of sociability and group cohesion (Akcaoglu & Lee, 2016). Students indicated that being in small discussion groups had a significant number of benefits, including making it easier for them to get to know one another, engage in deeper conversations, and think more deeply. Students also indicated that being in the same small discussion group throughout the semester enabled them to connect more with one another.

Peacock and Cowan (2016) regard social presence as a critical component that drives collaborative learning by supporting the development of effective working relationships among peers as they engage cognitively with content to construct and confer meaning. They also argue that students must feel confident and safe among their peers to ask probing and challenging questions to support the development of deep cognitive presence.

Cognitive Presence

Cognitive presence is "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning" (Garrison et al., 2000, p. 89). It is important to

recognize that cognitive presence focuses on higher-order thinking processes as opposed to specific individual learning outcomes (Garrison, Anderson, & Archer, 2001). Critical thinking skills provide learners with a solid foundation to engage in a community of inquiry and reason through concepts and ideas to construct knowledge. Wilson-Robbins (2006) recommend that a model for critical thinking be defined and conceptualized at the beginning and intentionally promoted throughout a course to be effective. This includes incorporating the chosen model into instructional strategies and providing learners with opportunities to demonstrate their critical thinking skills.

Asynchronous discussion questions set the stage for developing and integrating the high level cognitive skills needed to develop critical inquiry. Garrison et al. (2001) propose a four phase critical inquiry model which includes a triggering event, exploration, integration, and resolution. Triggering events motivate learners by posing problems or asking questions to provide direction for and enhance discourse. Exploration allows learners to conduct research to solve or make sense of given problems. Integration occurs when learners solve problems and connect their ideas with the multiple perspectives and ideas of other learners. Finally, resolution allows learners to critically evaluate their solution to test its validity.

Gašević, Adesope, Joksimović, & Kovanović (2015) investigated online discussions and the effect of external motivation and externally facilitated regulation scaffolding on the development of cognitive presence. The results showed that grading asynchronous online discussions alone was not sufficient to help students reach higher levels of cognitive presence if the participation guidelines were not detailed enough to help students regulate their learning. However, if the instruction included participation guidelines, students demonstrated higher levels of cognitive presence. The study demonstrated that the combined effect of the externally facilitated regulation scaffolding for the expectations for participating in discussions with externally induced motivation through grades had a positive effect on cognitive presence.

Teaching Presence

Teaching presence is critical in facilitating interactions to help learners develop social presence and cognitive presence. The role of teaching presence includes designing the course to help students achieve stated learning outcomes. According to Anderson, Rourke, Garrison, and Archer (2001), it is the instructor's responsibility to facilitate effective learning with a clear purpose and focus on goals and outcomes. Garrison, Anderson, and Archer (2000) describe the essential responsibilities of the instructor which include setting the curriculum, designing instructional methods, establishing time parameters, utilizing the medium effectively, and establishing netiquette. They identified six indicators for facilitating discourse: (a) identifying areas of agreement and disagreement; (b) seeking to reach consensus and understanding; (c) encouraging, acknowledging, and reinforcing student contributions; (d) setting the climate for learning; (e) drawing in participants and prompting discussion; and (f) assessing the efficacy of the process. Also, instructors should provide direct instruction, which includes presenting content and questions, focusing the discussion on specific issues, summarizing the discussion, confirming understanding, diagnosing misperceptions, injecting knowledge from diverse sources, and responding to technical concerns.

Rubin and Fernandes (2013) studied the effect of teachers as leaders in online classes and explored the ability of instructors to create teaching presence and, in turn, build a strong and cohesive community of inquiry. The study included 874 students in 126 online courses. Overall, the study demonstrated that the higher the level of teaching presence the class reported, the higher levels of cognitive presence and social presence the class reported, as well as more agreement about all three. Teaching presence was more closely related to cognitive presence than to social presence, consistent with previous research by Shea, Li, and Pickett (2006), who also found that there was a significant link

between learners' sense of learning community, effective instructional design, and the instructor use of directed facilitation.

Zhang, Lin, Zhan, and Ren (2016) studied the impact of teaching presence on engagement. The study included 218 middle-school English teachers who participated in an online professional development course in Shanghai, China. The study directly measured online engagement and examined the impact of teaching presence on engagement. This study found that teaching presence influenced two overt engagement behaviors: (a)*constructive engagement behaviors* that included participating in voting activities, creating and commenting on personal and class blog posts, and creating and commenting on personal and class resources; and (b) *interactive engagement behaviors* that measured the frequency of student participation in online synchronous discussion activities. The results demonstrate the value and the importance of online facilitators' role in design, organization, facilitation, and direct instruction, which make up critical components of teaching presence.

It is clear from the literature that the development of presence in the online environment is essential for learning to occur, and the lack of it can cause learners to become dissatisfied and eventually drop out. Cognitive presence, social presence, and teaching presence are critical building blocks to support online learners' engagement and achievement of their educational goals. The research indicates that interaction is related to students' perception of presence; however, simply increasing the amount of interaction in the course is not enough. The quality of the interaction to create a sense of community to help learners achieve their educational goals must be the focus, along with cognitive presence to help learners construct meaning. In addition, teaching presence should support learners to connect with the course topics, find value in them, and see how they can be applied in the real world.

Cognitive scaffolding is another effective strategy for providing learners support to successfully engage in the online environment, effectively learn, and persist.

Cognitive Scaffolding to Support Persistence

Many learners enter the online environment without the prerequisite skills outlined by Rovai (2003), such as computer literacy, information literacy, and time management. They also lack strategies to plan, monitor, and evaluate their thinking and learning (Stavredes, 2011). Other learners may lack prior knowledge and need support in learning new content areas and competencies. Many institutions support students using individualized tutoring and supplemental instruction; however, this can be costly if student need is high. Cognitive scaffolding provides a strategic way to provide the appropriate support for a diversity of needs to help learners persist.

Cognitive Scaffolding Defined

Cognitive scaffolding was born out of Vygotsky's socio-cultural theory and the zone of proximal development. Vygotsky (1978) defined this zone as:

> The distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers.
>
> *(p. 86)*

Cognitive scaffolding is meant to support learners in this zone—in the gap between what they can accomplish on their own and what they can accomplish with the assistance of an individual with more advanced knowledge and skills. Wood, Bruner, and Ross (1976) discuss several scaffolding

functions in their seminal research. These functions include gaining the learners' attention, simplifying the learners' role in completing the task, keeping learners focused on the task, emphasizing relevant features of the task, alleviating frustration, and modeling the task (p. 98).

The key to incorporating cognitive scaffolding strategies is to use the right amount of scaffolding to support learners in their zone of proximal development. Dabbagh (2003) writes:

> too much scaffolding could result in dampening students' efforts to actively pursue their learning goals, causing them to lose their momentum or drive towards meaning making and self-directed learning efforts, and too little scaffolding could result in students' inability to successfully complete or perform certain tasks and instructional activities, leading to anxiety, frustration, and finally loss of motivation and attrition.
>
> *(p. 40)*

The use of the term *scaffolding* alludes to the nature of this strategy. Over time, cognitive scaffolding is reduced until learners can complete the task or function independently (Greenfield, 1984). This also propels them into a new zone of proximal development in which new strategies may be used to support further learning. Ultimately, if applied over time, this helps learners to become self-regulated—able to motivate themselves, plan their learning process, assess their progress and adjust strategies, and locate and use resources to support their learning (Schunk & Zimmerman, 1994).

Cognitive scaffolding may be implemented in a static or fixed manner, or in a dynamic and collaborative way (Sharma & Hannafin, 2005). Static scaffolding focuses on anticipating needs in advance and designing the instruction to support all learners. This may include thinking about common misconceptions or difficult subject matter or reflecting on previous experiences teaching specific concepts and where learners may have had difficulty. Dynamic scaffolding, on the other hand, can be used to support the facilitation of activities and may be used for individual learners or the group. This dynamic scaffolding may operate on many levels at once. Joyce E. Many (2002) discusses how an intended scaffold for one learner may impact another learner as a different scaffold. For example, she explains how affirming a learner's understanding may also serve as a model for another learner and a prompt for a third learner (p. 401). Li, Price, and Fu (2011) present a model that blends the two approaches. They discuss the creation of a repository of resources created during course design that the instructor then modeled the use of and referred specific learners to, as needed, throughout the semester. This approach allowed more advanced learners to self-select needed resources and the opportunity for the instructor to provide more guidance and personalized scaffolding for developing learners.

Hannafin, Land, and Oliver (1999) categorize scaffolding into four types—conceptual, metacognitive, procedural, and strategic. *Procedural scaffolding* guides learners about "how to utilize resources and tools" (p. 133). This may include orientations to a system or tool, such as an online courseroom, or just-in-time tutorials or explanations. *Metacognitive scaffolding* helps guide learners about "how to think" (p. 131). This may include specific strategies for working through content such as using a critical thinking model or the scientific method. It can also include more general strategies such as prompts to reflect on goals, to link concepts to prior knowledge, to evaluate progress, and to determine specific resource needs. *Conceptual scaffolding* guides learners about "what to consider" (p. 131). This includes helping learners work through complex problems, correcting common misconceptions, and identifying key concepts and ideas related to the task at hand, for example, through concept maps or content trees. Finally, *strategic scaffolding* guides learners on "approaches to learning tasks or problems" especially focusing on multiple alternative approaches. This may include strategies for identifying, evaluating, and relating information to existing knowledge, providing questions to consider, and seeking expert advice (p. 132–134).

While Hannafin et al. (1999) focused on the application of these categories within the open learning environment (OLE), Stavredes (2011) reinterprets and adapts these categories to fit the online learning environment. She explains *procedural scaffolding* as supporting navigation in the online course environment and explaining how to engage in learning activities. She also divides procedural scaffolding into three types: orientation, expectation, and resource. *Metacognitive scaffolding* is explained as support for "the development of general academic skills to help learners manage their learning" (p. 103). She expands on metacognitive scaffolding by categorizing it into planning, monitoring, and evaluating scaffolds to support learners' thinking processes as they engage in learning activities. She explains *conceptual scaffolding* as focusing on supporting learners when they "encounter new information or information that is difficult to understand" (p. 103). Finally, she explains *strategic scaffolding* as emphasizing "alternative learning pathways that can be applied to the learning context to meet the diverse needs of learners" (p. 149–150). She recommends using strategic scaffolding to support individual learning needs and provide just-in-time support to help learners persist.

The functional categories presented by Hannafin et al. (1999) and further refined by Stavredes (2011) help to simplify the application of the complex concept of scaffolding. They also provide a strategy for identifying the underlying instructional purpose of course activities and lessons, and integrating specific scaffolds to support critical learning needs. The following paragraphs provide an in-depth look at these categories and current applications present in the literature.

Procedural Scaffolds

Stavredes (2011) describes procedural scaffolding as guiding learners as they learn how to navigate the online course environment and engage in learning activities (p. 150). She explains that learners may have difficulty understanding where to start in an online course, especially given the diversity in how online content may be delivered, the variety of resources available, and new expectations for participating in a course (p. 112). She describes three types of procedural scaffolds that can help the learner persist—orientation, expectation, and resource scaffolds.

For orientation, Tomei, Hagle, Rineer, Mastandrea, and Scollon (2009) recommend, at minimum, the following information to be included: bookstore link, course syllabus, login information, technical contacts, and necessary technical competencies (p. 82). MacGregor and Lou (2004–2005) focused their research on the use of scaffolding in WebQuests, a resource-based learning strategy that supports and organizes the use of Web resources (p. 161). They argue that the usability and navigation of the sites used in the WebQuests may be thought of as procedural scaffolds (p. 173). In their study of scaffolding pre-service teachers' design of WebQuests, Wang and Hannafin (2009) found that procedural scaffolds, including templates with a structure and description for each design component and the demonstration of technical skills related to design, were helpful to learners. They also found that procedural scaffolds helped learners reduce their cognitive load for the task and improve the output of their work; in this case, their WebQuest designs.

Gašević, Adesope, Joksimović, and Kovanović (2015) investigated the use of role playing and scaffolding to support increased cognitive presence with 81 participants who were enrolled in a master's program in information systems offered at a fully online comprehensive university in western Canada. The researchers found that the use of role assignments and externally facilitated regulation produced the highest level of cognitive presence. The role assignments needed to be scaffolded using explicitly scripted expectations for the role describing specific duties the students were requested to carry out. Externally facilitated regulation scaffolds were in the form of participation guidelines for all students to understand expectations for engaging in the role play scenarios.

Puntambekar and Stylianou (2005) conducted a two-part study to examine the types of support learners need in a hypermedia environment. In the first study, they studied 74 middle school students

navigating through an instructional environment called CoMPASS. They focused on the paths students took to navigate through the environment and the impact those paths had on learning. They found that learners need metacognitive strategies to assist with navigation through the system. They use the term metanavigation to define this type of support "designed to enable students to reflect upon and monitor their link selection while navigating through a hypertext system" (p. 469). In the second study, they designed, implemented, and tested these metanavigation cues. They found that students who received a tailored metanavigation aid provided better and richer explanation of the content and improved connections among concepts. This study seems to indicate a type of hybrid scaffolding. Although the prompts were used to support navigation, indicating a procedural scaffold, they were done so within the framework of metacognition, the next type of scaffolding discussed.

Metacognitive Scaffolds

Metacognitive scaffolding supports learners' thinking processes and management of their learning (Hannafin et al., 1999; Stavredes, 2011). Bannert, Hildebrand, and Mengelkamp (2009) focused on the use of metacognitive scaffolding to prompt learners to use metacognitive skills they previously developed in prior learning experiences (p. 830). They used an experimental research design with 56 university students. The experimental group received instructions on the use and value of a metacognitive support device and were prompted to use the device during learning activities. The control group did not receive the instruction and prompts but were instructed on how to organize their study space. They found that the experimental group reported more metacognitive activities and cognitive organization activities; however, there were no significant differences in cognitive elaboration and rehearsal. They also did not find significant differences in recall; however, there was a significantly different in-task transfer (p. 833). They concluded that these findings were in line with previous research and that performance on transfer tasks should be the evaluation criteria for the educational effectiveness of metacognitive interventions (p. 834). Their methods incorporated both paper-based and computer-based supports, and they indicate that further research into online measures would be an important addition to this research. Although they outline many limitations and stipulations in their study, they posit that their research provides a confirmation of the need for metacognitive support in electronic learning environments.

Reingold, Rimor, and Kalay (2008) studied the relationship between instructor feedback and learners' metacognitive processes in an online course on democracy and multiculturalism. They analyzed 700 postings, written by 68 students based on the Meta Cognitive tool for Students' Reflections (MCSR) that analyzes learners' reflections based on metacognitive dimensions and categorizes them as personal, task, or strategy reflections. They also developed a new tool, Tool for analyzing Instructor's Online Scaffolding (TIOS), to analyze the types of scaffolding support instructors provide, including technical, content-centered, procedural, and metacognitive (p. 142). They found a significant positive correlation between instructor's scaffolding efforts and students' metacognition. In discussing the results, they posit that appropriate instructor responses can emphasize learning through reflective and metacognitive processes. These efforts include:

> the presentation of the rationale for the task, fostering the integration across various course readings and course objectives, supporting reflective writing, differentiating between conclusion, fact, opinion and hypothesis, supervising text comprehension, focusing on the process of learning and encouraging interactions among the participants.
>
> *(p. 147)*

Metacognitive scaffolding designed to facilitate planning, monitoring, and evaluating processes during a design problem-solving activity was studied by An and Cao (2014). In their study, an

experimental group was required to complete and submit a planning worksheet before they designed a technology-enhanced lesson. Following the completion of the planning sheet, the instructor provided feedback and used question prompts to facilitate monitoring and evaluation processes. Data analysis revealed that the planning sheet served as a roadmap during the students' design problem solving, which helped them monitor and evaluate their progress. Qualitative data analysis revealed that the use of the planning sheet provided a metacognitive scaffolding to facilitate students' design problem-solving processes by helping them "set goals and deadlines, engage in research, organize their ideas and thoughts, correct misunderstandings, revise ineffective plans or strategies, avoid procrastination, use time effectively, and monitor and evaluate their progress" (p. 562).

Conceptual Scaffolds

Conceptual scaffolding guides learners about "what to consider" during learning, especially in the case of complex concepts (Hannafin et al., 1999). Advance organizers, study guides or questions, definitions, graphical organizers, outlines, concept maps, and hints are examples of conceptual scaffolding strategies (Stavredes, 2011).

As previously mentioned, MacGregor and Lou (2004–2005) studied the use of scaffolding with WebQuests. In addition to their findings with procedural scaffolding, they found that "providing a study guide that identified what information to extract and a concept map that provided cues for organizing and synthesizing their information were helpful in keeping students on task and facilitated high-order learning" (p. 172). In Wang and Hannafin's (2009) research, a grading rubric with specific requirements and points for a WebQuest design activity was considered a conceptual scaffold, and was found to be very useful.

Harris (2008) focused on the application of scaffolding in reflective journaling. Her formal scaffolding included an introduction to reflective journaling, which she found to be appropriate and successful. Included in her introduction was a discussion about reflective journaling including its value and implementation, potential difficulties including timing, effort, and maintaining effort, and generic example entries (p. 316). She also created an assignment guide which included a rationale, suggested framework, and an organization and time structure to further scaffold the reflective journal process. In addition, she implemented a writer-responder critique and a student self-evaluation form. These scaffolding examples could be applied in a variety of tasks to help focus learners on the most important concepts related to their learning task.

Delen, Liew, and Wilson (2014) examined students' self-regulatory behaviors in an online enhanced video environment. Eighty undergraduate and graduate students were randomly assigned to either a control group that used a common video or an experimental group that used an enhanced video designed to scaffold students' self-regulated learning. The control group common video content included micro-level interactive functions such as play, pause, and rewind/forward. The experimental group enhanced video included macro-level functions including note-taking, supplemental resources, and practice questions. The study results indicated that the enhanced video was a superior instructional tool in terms of students' learning performance and students invested significantly more time in their learning when compared to student using the common video learning environment. In particular, students chose to view supplemental resources and answer practice questions. In addition, graduate students' who self-reported self-regulation and observed self-regulation, were more likely to engage more in interactive note-taking.

Chen, Wei, and Li (2016) conducted an exploratory case study of students' experiences and perceptions using video simulations to scaffold conceptual knowledge. The findings of the study indicated that students found the simulation videos useful in understanding complicated concepts. The use of illustrated texts, audio, and videos promoted situated understanding and reinforced difficult concepts and problem-solving processes. The researchers suggest the design considerations for

producing an instructional video such as professionally producing high-quality video and breaking up the content into smaller videos (p. 162).

Strategic Scaffolds

Strategic scaffolding supports learners in completing specific learning tasks or problems, focusing on multiple alternative approaches (Hannafin et al., 1999). Stavredes (2011) focuses strategic scaffolding as a just-in-time strategy for supporting individual learner performance (p. 147). In the online courseroom, this just-in-time approach requires frequent dialogue, which is a major theme in cognitive scaffolding literature.

Palincsar (1986) argues that "dialogue has a critical role to play in scaffolded instruction, facilitating the collaboration necessary between the novice and expert for the novice to acquire the cognitive strategy or strategies" (p. 95). Many of the insights she provides are still relevant in today's online classroom. She discusses the importance of supporting learners' contributions, linking learners' ideas to new ideas, providing focus and direction, making instruction explicit, and moving learners' responses from negative statements to more constructive statements (p. 96).

Many (2002) also addresses the use of cognitive scaffolding in face-to-face dialogue, or what she calls instructional conversations. She discusses how scaffolding may be integrated throughout discussions as opportunities arise in the form of direct assistance, using questions and prompting statements, and monitoring and affirming learners' understanding. Whipp and Lorentz (2009) discuss specific suggestions for online instructors that parallel Many's (2002) study. These include the use of challenging questions, prompts for elaboration of ideas, and sharing knowledge from personal and professional experience and resources (p. 187).

Lee (2009) focused her study on the use of experts in monitoring group discussions in a foreign language teaching methods course. In addition to an instructor, the online, asynchronous discussions included expert language teachers who taught foreign language in the five years prior to the study (p. 214). She explains that the expert went beyond information sharing, clarification, and explanation but also challenged learners to critically reflect on the topics (p. 222). Many of the learners expressed that the experts enhanced their reflection and discussion of the topics but others expressed feelings of information overload. Lee cautions that "the role of the expert is to monitor, not to dominate the discussion" (p. 223).

In addition to dialogue strategies such as prompts and probing questions, Stavredes (2011) discusses the uses of worked examples and expert advice as effective strategic scaffolding applications. Clark and Mayer (2011) also discuss the effectiveness of worked examples in building knowledge for long-term memory. They define a worked example as a "step-by-step demonstration of how to perform a task or solve a problem" (p. 224). Based on their review of empirical research, they recommend that worked examples replace some practice exercises for beginning learners, use principles regarding effective media, are realistic and diverse, and help learners explain the examples in their own words.

Conclusion

With the continued growth of online learning, it is critical to understand factors that contribute to learner success. From the review of literature, we found a number of factors that impact leaners' ability to persist. Although many factors are beyond the control of the institution, engagement appears to be an important factor that contributes to student success. Research indicates that structuring activities to develop social, cognitive, and teaching presence can support engagement and deep learning. Cognitive scaffolding can be incorporated into the design of the online course and used by instructors to support learners individually to help them navigate the online environment, plan, monitor, and evaluate their learning, develop understanding of concepts, and strategically support

learners just-in-time. Together, these strategies assist online instructors in addressing many variables that effect persistence and provide them with valuable tools to support learners in achieving their educational goals and completing their program of study.

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11
MOTIVATION IN DISTANCE EDUCATION

Maggie Hartnett

Motivation is central to successful learning and achievement (Wentzel & Brophy, 2014) and has been described as the "engine" of learning (Paris & Turner, 1994, p. 217). It influences how individuals think, act, and feel while learning. A comprehensive body of research and literature has explored motivation across a broad range of educational environments and diverse groups of learners, including distance education contexts (Hartnett, 2016). That motivation is complex is demonstrated by the variety of theoretical frameworks that have emerged over time to try to explain what motivation is; what affects it; the relationships between motivation, learning and achievement; and how motivational processes work (Schunk, Meece, & Pintrich, 2014).

Motivation: A Definition

Wentzel and Brophy (2014) define motivation as "a theoretical construct used to explain the initiation, direction, intensity, persistence, and quality of behavior, especially goal-directed behavior" (p. 2). Motivation is concerned with goals that direct attention and behavior in pursuit of their achievement. It concerns what gets us moving, what keeps us moving, why we engage in particular activities, our level of commitment and effort, and whether we stick at a task even when there are setbacks along the way.

As motivation is a theoretical construct concerned with particular processes rather than outcomes, it cannot be directly measured. Instead, it is inferred from behavioral indicators that include the choices made by learners; the effort expended, both physical and cognitive; persistence, particularly in the face of difficulties; and academic achievement, as well as reports from individuals (Schunk et al., 2014). Motivation is typically measured using direct observation, ratings of behavior by others (e.g., teachers or researchers), self-reports and, increasingly, online activity in distance education courses (Hartnett, 2012).

In educational settings, motivation explains the degree to which learners devote attention and energy to various learning requirements. More generally, high levels of motivation are linked to active engagement with learning, enjoyment of learning, acceptance of challenge, deep approaches to learning, persistence, academic performance, and creativity (Amabile, 1985; Brophy, 2010; Ryan & Deci, 2000b; Schunk et al., 2014; Stipek, 2002). Research indicates low levels of motivation are a contributing factor to low retention rates in distance education (Artino, 2008; Keller, 2008), which is defined as "teaching and learning in which the teaching normally occurs in a different place from learning, requiring communication through technologies, as well as special institutional

organization" (Moore & Kearsley, 2012, p. 2). Conversely, high levels of motivation have been associated with distance learner retention (Levy, 2007). Additionally, motivation has been linked to perceptions of learning (Kickul & Kickul, 2006), learner satisfaction (Artino, 2008), online participation (Xie, DeBacker, & Ferguson, 2006), greater exploration by learners (Martens, Gulikers, & Bastiaens, 2004), academic performance (Yi & Hwang, 2003), and success or failure in online courses (Rovai & Wighting, 2005). It is clear, then, that motivation is a vital consideration for distance education.

Conceptual Foundations

Early theories defined motivation in terms of inner forces such as traits, instincts, drive, and behavior (Schunk et al., 2014). One such theory of motivation that has been prominent in education is operant conditioning (Skinner, 1974), which describes the process of establishing behaviors using the principles of reinforcement. This theory assumes that behavior is initiated due to specific antecedents and is followed by consequences. A positive reinforcer is a stimulus that is presented following desired behavior and is intended to increase the likelihood of that behavior in the future. The use of rewards (e.g., grades, praise) that are made contingent on desired behavior, and punishment (e.g., sanctions) contingent upon undesired behavior, is a common application in education. Behavioral theories such operant conditioning were influential in the design and development of early computer-based education programs (Lowe, 2002) and instructional design models for Web-based instruction (Janicki & Liegle, 2001).

Over time, a range of limitations associated with behavioral theories were identified. These include: reward effectiveness is often short-lived, rewards have been shown to have negative consequences in terms of learner willingness to attempt challenging tasks, and rewards can also convey the message that a task is not worth doing for its own sake (Stipek, 2002). What these limitations highlight is that although reinforcement and punishment can motivate students, their effect is not automatic but depends on beliefs (Schunk et al., 2014).

While motivation is still viewed by some as a relatively stable trait (e.g.,Yukselturk & Bulut, 2007), contemporary theories acknowledge the complex interrelationships between personal, social and contextual factors that influence motivation (Zimbardo, Johnson, & Weber, 2006). Most current theories also accept that emotions, in addition to values, cognitions and behavior, form part of the motivational landscape (Schunk et al., 2014).

Rather than viewing the two perspectives (i.e., personal trait vs. situation-specific state) as separate and distinct, Wentzel and Brophy (2014) argue that motivation can be viewed from both standpoints. For example, some people exhibit a general disposition toward high levels of motivation to learn, while others only seem motivated in specific situations such as when they perceive a task as interesting, useful or enjoyable. A "person and the context" (Turner & Patrick, 2008, p. 129) view of motivation recognizes the complex interplay of factors (i.e., personal and contextual) that impact on motivation to learn.

Understanding of the motivation of distance learners has emerged from earlier distance education models and adult learning theories (Knowles, 1984) that consider these learners as confident, self-directed, independent, and highly motivated (Bates, 2005; Cercone, 2008). Studies comparing distance and campus-based students are relatively common (Rovai, Ponton, Wighting, & Baker, 2007; Shroff & Vogel, 2009; Wighting, Liu, & Rovai, 2008). Findings reflect a personal trait perspective of motivation and suggest that distance learners are more intrinsically motivated than on-campus students. But as the use of digital technologies opens up educational opportunities to a more diverse group of learners, these assumptions have been questioned (McCombs & Vakili, 2005).

Motivational Theories Organizational Framework

Exploring motivation to learn in distance education should be guided by robust theories of motivation (Moos & Marroquin, 2010). More recently, researchers have moved away from trying to

develop one overarching theory of motivation, which attempts to explicate all aspects of motivated behavior, to theories that focus on specific dimensions of motivation. Given the complexity and multi-faceted nature of motivation, several of the resulting theories are interconnected, even though they incorporate different constructs and explanations (Seifert, 2004). A general *expectancy-value model of motivation* (Wentzel & Brophy, 2014) provides a helpful organizational framework for conceptualizing the various theories and understanding the different decisions individuals make when deciding whether to engage or not. Motivation theories that concentrate on learners' beliefs and judgments about their capabilities to perform a given task sit within the expectancy component of motivation (Bandura, 1997). Self-efficacy (Bandura, 1997) and causal attributions (Weiner, 1986) are examples of well-known theories that look at learners' expetancies for success. The beliefs individuals hold about the reasons why they want to undertake a course of action and the importance they ascribe to it are encompassed by the value component (Eccles & Wigfield, 2002). Intrinsic and extrinsic motivations (Ryan & Deci, 2000a), interest (Hidi, Renninger, & Krapp, 2004), and goal orientations (Murayama, Elliot, & Friedman, 2012) focus primarily on the value component of learners' motivation.

Expectancy Aspects of Motivation

When approaching learning activities, people make judgements about their capabilities to succeed based on perceptions of their knowledge, ability, and skills. If an individual expects to succeed, then they are more likely to engage in a task, while the reverse is true for those who doubt their ability. They are essentially asking the question "can I do it?" The answer to this question can have important effects on an individual's motivation for a given task.

The concept of self-efficacy was developed by Bandura (1997), who defined it as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). It is an individual's future-focused judgment of their confidence to successfully complete a specific task within a particular context. Self-efficacy is concerned with performance capabilities rather than personal qualities (e.g., self-esteem, self-worth), and judgments are determined using mastery criteria (i.e., success or failure) rather than comparisons with others (Zimmerman, 2000). Research shows that self-efficacy is a major motivational factor that affects a student's effort, choices, persistence, and achievement (Schunk et al., 2014).

Individuals use four main sources of information to make judgments about their efficacy for a specific activity. These include: positive performance experiences associated with appropriately challenging tasks (mastery), attending to other students of similar ability who demonstrate effortful action and achieve success (vicarious experiences), credible encouragement from a trusted person (verbal persuasion), and emotional support that reduces negative psychological experiences such as anxiety and frustration (Wentzel & Brophy, 2014).

Self-efficacy is a predictor of learner performance and satisfaction in distance and online education (Artino, 2008; Kuo, Walker, Belland, & Schroder, 2013). Efficacious distance learners set more challenging goals, readily participate in activities, expend greater effort, tend to think more critically, adopt metacognitive learning strategies, and persist longer in the face of difficulties than less efficacious learners (Artino & Stephens, 2006; Hart, 2012; Moos & Azevedo, 2009; Wang & Wu, 2008). Previous successful distance learning experiences are also known to support student perceptions of efficacy about future distance courses (Bates & Khasawneh, 2007).

In addition to self-efficacy, the reasons learners give for past successes and failures (causal attributions) also affect their expectancy for success. Attribution theory (Weiner, 1992) argues that people are motivated to understand themselves and the reasons why things happen. It is an individual's perceived causes that are important regardless of whether these are the actual causes or not. Searching for the cause of why something occurred is more common when the situation is novel or personally

important, or when the outcome was unexpected or negative (Schunk et al., 2014). Attributions have both psychological and behavioral consequences for motivation and learning.

Causal attributions are influenced by a range of factors including personal beliefs and individual characteristics, information from others (e.g., peers and teachers), and feedback about performance (Schunk et al., 2014). Context also plays an important role in the determination of attributions. Causal attributions help to explain problems observed within collaborating groups of distance learners. Findings suggest that when people do not have sufficient situational information which often occurs in dispersed groups whose communication is mediated by technology, they tend to make personal attributions with corresponding, often detrimental consequences for group cohesion and learning (Cramton, 2001).

Common causal attributions that learners make relate to ability, effort (both short and long term), task difficulty, factors associated with the teacher, skills and knowledge, and health or luck (Weiner, 1992). While there are potentially many causal attributions for a given situation, they can be categorized along three main dimensions (Weiner, 1986). These include: whether the locus of the cause is perceived as internal to the learner (e.g., skills and knowledge) or external (e.g., teacher factors), whether the cause is viewed as stable (e.g., aptitude) or unstable (e.g., short term effort), and if the cause is seen as controllable (e.g., long-term effort) or not (e.g., task difficulty). It is these causal dimensions rather than that actual attributions that influence expectancy for success and self-efficacy, as well as actual behavior (Schunk et al., 2014). Practitioner feedback influences the attributions learners make particularly following perceived failure. Unless there is an obvious lack of effort, feedback that highlights lack of strategy use or information rather than ability can support learners to make attributions that support self-efficacy and motivation (Wentzel & Brophy, 2014).

Value Aspects of Motivation

Whether learners choose to engage or not is not exclusively determined by their expectancy for success; they also make judgments about the perceived value of the tasks they are being asked to undertake. In order to arrive at a decision, individuals ask themselves a second question: "do I want to do it, and why?" Perceived value is influenced by a range of factors including intrinsic value, interest, attainment value, utility value, and goals.

The value component of motivation is often examined in terms of intrinsic and extrinsic motivation. "Intrinsic motivation is defined as the doing of an activity for its inherent satisfactions rather than for some separable consequence" (Ryan & Deci, 2000a, p. 56), and is closely linked to the concept of intrinsic value (Wigfield, Cambria, & Eccles, 2012). An intrinsically motivated learner enjoys engaging in a task because of the challenge, interest, and enjoyment it offers rather than because of any external pressures or rewards. Intrinsically motivated learners are more likely to undertake challenging tasks, adopt a deep approach to learning, enjoy learning, and achieve success (Schunk et al., 2014; Wentzel & Brophy, 2014). Contrast this with extrinsic motivation which is "a construct that pertains whenever an activity is done in order to attain some separable outcome" (Ryan & Deci, 2000a, p. 60). In other words, extrinsic motivation is associated with a source outside of the actual activity such as grades, prizes, feedback, approval, or engaging in a program of study for a future career.

The popular view considers intrinsic and extrinsic motivation as dichotomous constructs, with intrinsic motivation having more worth or value. This judgment of worth is understandable, given the positive association between learning outcomes and intrinsic motivation. However, research has shown that in any given situation at any given point in time, individuals can be *both* intrinsically and extrinsically motivated to a greater or lesser degree (Hartnett, St. George, & Dron, 2011; Lepper, Henderlong Corpus, & Iyengar, 2005), indicating motivation is more complex than a simple binary

model. Furthermore, the quality and intensity of intrinsic and extrinsic motivation vary over time and are specific to the person and context (Hartnett, 2016; Schunk et al., 2014).

There is a rich body of research that has investigated a broad range of external events and their effect on intrinsic motivation. The most extensively studied are extrinsic rewards (Deci, Koestner, & Ryan, 1999). Researchers have explored, in considerable depth, the use of rewards in order to understand when the use of rewards can undermine intrinsic motivation, and when they cannot. Research shows that extrinsic rewards are more suited to increasing the intensity of effort than they are to improving the quality of learning. If a reward is offered for an activity that learners have engaged in previously from a sense of enjoyment and interest, then intrinsic motivation is often undermined (Schunk et al., 2014). However, rewards do not always undermine intrinsic motivation, particularly if they are: task-contingent, so that attention is drawn to the learning task itself, and are linked to the specific context, so that students are encouraged to value their accomplishments rather than being rewarded for participation; offered unexpectedly following successful task completion; and used in intangible ways such as informative feedback or social recognition (for a review, see Wentzel & Brophy, 2014). "The key to rewarding effectively is to do so in ways that support students' motivation to learn and do not encourage them to conclude that they engage in activities only to earn rewards" (Wentzel & Brophy, 2014, p. 48).

A reward-related technological innovation that is generating considerable interest is digital badges. Digital badges are "a representation of an accomplishment, interest or affiliation that is visual, available online, and contains meta-data including links that help explain the context, meaning, process and result of an activity" (Gibson, Ostashewski, Flintoff, Grant, & Knight, 2013, p. 404). Some argue that digital badges have the potential to open up new possibilities for engaging and motivating learners (Grant, 2016). However, emerging research exploring digital badge use indicates that it can't be assumed that they are universally motivating for all learners (Abramovich, 2016). Their effectiveness depends on learners' prior knowledge and experience, with learners who have had previous positive experiences of digital badges more likely to be motivated by their use (Abramovich, Schunn, & Higashi, 2013). Participation badges have potential negative effects on motivation because of their minimal connection to skill and knowledge development. Therefore, learners tend to view them as external motivators. Conversely, skill badges, awarded based on performance, are considered by learners as supportive of autonomous motivation (Abramovich et al., 2013).

More broadly, researchers have investigated learners' motivation for engaging in distance courses (e.g., Hartnett, 2016; Martens et al., 2004; Shroff & Vogel, 2009; Shroff, Vogel, & Coombes, 2008; Xie et al., 2006). Collectively, results show that the intrinsic motivation of learners is influenced by the choices provided; feedback received and the timeliness of that feedback; task interest, relevance and challenge; perceptions of academic and technological competence; and the establishment of an inclusive learning community, wherein the teacher is an active member and all learners are respected and supported.

Although intrinsic motivation is an important consideration for learning, researchers have long recognized that students will not be intrinsically motivated in all situations. This is because motivation is the result of a complex mixture of learners' different socialization histories, perceptions of competence, and various experiences of the same context (Stipek, 2002). The need to look beyond intrinsic motivation has resulted in a more in-depth analysis of the nature of intrinsic and extrinsic motivation. Earlier views of intrinsic motivation characterized it as self-determined or autonomous, and extrinsic motivation as externally controlled (Deci & Ryan, 1985). However, as research emerged that not all extrinsic events undermine intrinsic motivation (such as the use of some rewards to extrinsically motivate learners), a more nuanced view of extrinsic motivation developed (Ryan & Deci, 2000a). Self-determination theory (Ryan & Deci, 2000a, 2002) explains extrinsic motivation as a continuum that ranges from externally controlled types of extrinsic motivation with minimal

self-determination, to more internal, autonomous self-regulation whereby a learner engages in an activity because of its importance to their sense of self.

More self-determined types of extrinsic motivation are linked to task value components such as attainment value and utility value (Eccles & Wigfield, 2002). Attainment value refers to the importance of being successful in order to affirm self-concept and sense of self or to achieve skill mastery. Utility value or usefulness concerns perceptions of how an activity is personally relevant or meaningful, and can help achieve a learner's larger goals such as a future career goal. Research has demonstrated that more self-determined forms of extrinsic motivation are linked to positive outcomes for learning similar to intrinsic motivation (Reeve, Deci, & Ryan, 2004; Reeve, Jang, Hardre, & Omura, 2002). In line with these findings, distance education research has highlighted the need to consider both intrinsic motivation and autonomous types of extrinsic motivation that emphasize the relevance of learning (Hartnett et al., 2011).

In addition to intrinsic and extrinsic motivation, learners' interests also affect value aspects of motivation. Interest is closely aligned to intrinsic motivation, and researchers distinguish between two types of interest (Hidi & Renninger, 2006). Individual (or personal) interest is considered to be a relatively stable characteristic or motivational orientation toward particular activities. Research indicates that the level of individual interest is linked to learning online (Renninger, Cai, Lewis, Adams, & Ernst, 2011) and is boosted in online contexts that support learner autonomy (Moos & Marroquin, 2010). Moreover, higher levels of engagement occur when learners are personally interested in the content (Schallert & Reed, 2003) and have an individual interest in computers (Sansone, Fraughton, Zachary, Butner, & Heiner, 2011).

Although the importance of individual interest for learning and motivation is well recognized (Hidi & Renninger, 2006), research has highlighted the value of situational interest as a way to encourage learner involvement and motivation for particular tasks (Hidi & Harackiewicz, 2000). Situational interest tends to be less enduring than individual interest as it stems from conditions within the environment (Hidi & Ainley, 2008). The inclusion of conceptual scaffolding in online courses has been shown to increase situational interest (Moos & Azevedo, 2008). Two different types of situational interest exist, namely triggered and maintained (Hidi & Renninger, 2006). Triggered situational interest is short-lived and often associated with new or novel tasks or situations such as the use of computers (Hidi & Renninger, 2006). However, researchers have cautioned that there is a need to account for novelty effects frequently seen in technology-rich environments where learner interest decreases with time (Moos & Marroquin, 2010). Maintained situational interest tends to be more sustained and has the effect of focusing attention over an extended period. Maintained situational interest is promoted through environmental conditions such as the use of meaningful and authentic learning tasks (Blumenfeld, Kempler, & Krajcik, 2006; Boekaerts & Minnaert, 2006). Interest is an important consideration in newer open online learning environments such as MOOCs (massive open online courses). Research indicates that learners tend follow their specific interests (Kizilcec & Schneider, 2015), with course completers more interested in the course content while non-completers are more interested in MOOCs as a type of learning experience (Wang & Baker, 2015).

Another approach to studying motivation is to focus on learners' achievement-related behavior. Goal orientation theories explore learners' beliefs for engaging in achievement-related behavior particularly beliefs that result in "different ways of approaching, engaging in, and responding to achievement situations" (Ames, 1992, p. 261). This contrasts with more general goal setting which can be a useful motivational tool. Within goal theory, the two orientations that have been investigated most often are mastery (also called learning or task-involvement) goals and performance (or ego-involved) goals (Schunk et al., 2014). Learners who adopt a mastery orientation tend to concentrate on understanding what they are learning and developing new knowledge and skills, when the standard for judging success is intrapersonal. Research has demonstrated positive relationships between learning goal orientation and learner participation in online discussions (Dawson, Macfadyen, & Lockyer,

2009), metacognitive strategy use of distance learners (Chen & Wu, 2012), and distance learners' overall satisfaction (Kickul & Kickul, 2006). Learning goal orientation is also a predictor of distance learner achievement (Crippen, Biesinger, Muis, & Orgill, 2009).

A performance goal orientation, on the other hand, focuses on demonstrating capability where the standard for achievement is interpersonal (Murayama et al., 2012). The types of strategies learners use in distance learning contexts vary based on their goal orientation (Moos & Marroquin, 2010). Students who assume a performance orientation are more likely to focus on assessed activities (Bures, Abrami, & Amundsen, 2000) and administrative tasks (Dawson et al., 2009) compared with learners who adopt a learning goal orientation. Performance orientations are further categorized into performance-approach (wanting to show competence in relation to others) and performance-avoid (wanting to avoid looking incompetent) orientations (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). Performance-approach goals can potentially be positive for learning particularly when combined with a learning goal orientation leading to optimal motivation (Harackiewicz et al., 2002).

Strategies for Promoting Motivation in Distance Education

The expectancy and value aspects of motivation emphasize how individuals require opportunities to learn in a supportive environment where they feel sufficiently efficacious to undertake the tasks required and perceive the curriculum and activities to be worth doing in order to expend the time and effort required to be successful. From a "person in context" (Turner & Patrick, 2008) perspective, both what learners bring to their learning and the context in which the learning occurs influence overall motivation to learn. Fostering the motivation of learners engaged in distance education, therefore, requires attention to a range of factors that can include the curriculum, teaching practices, design of learning activities, the efficacy of learners, digital technologies used, assessment approaches, and the shared aspects of learning (Hartnett, 2016).

Several motivation frameworks exist, incorporating both expectancy and value components, which can aid the systematic design and development of educational experiences that attend to the motivational aspects of learning. A well-known framework is Keller's (2010) ARCS model of motivation design. The categories of attention, relevance, confidence, and satisfaction (ARCS) serve as guidelines for the development of teaching strategies that capture learner attention, establish the relevance of learning, foster learner confidence, and support a sense of satisfaction via intrinsic and extrinsic rewards (Keller, 2010). Although not originally designed for distance education, the ARCS model has been used to develop instruction in distance education courses to enhance the motivation of learners (Keller, 2008, 2010; Keller & Deimann, 2012) and has informed various research studies (ChanLin, 2009; Hodges & Kim, 2013).

A second model used to support the methodical creation of motivational learning plans is Ginsberg and Wlodkowski's (2000) motivational framework for culturally responsive teaching. Ginsberg and Wlodkowski offer a model built on principles and structures that are meaningful within and across cultures that incorporate establishing inclusion, developing attitude, enhancing meaning, and engendering competence. Its purpose is to encourage teaching practices that support the expression of high-quality motivation of all learners.

Establishing Inclusion

The first principle, *establishing inclusion* (Ginsberg & Wlodkowski, 2000), refers to principles and practices that contribute to a learning environment in which teachers and students feel respected by and connected to each other. Norms, procedures and structures that contribute to the creation of a supportive community are needed for this to occur. The teacher is a central member and is therefore essential to the development of any effective distance learning community. Well-known practitioner

strategies such as adopting an open, inviting approach to communication, treating students equitably, and supporting all learners to share their thoughts and ideas are ways in which practitioners can model supportive relationships that can foster motivation to learn (Jones & Issroff, 2007).

Interaction is the foundation of an inclusive community and needs to be designed within courses (Rovai, 2007). Furthermore, the benefits of online collaboration for motivation and learning are well-known (Anderson, 2008; Hartnett, St. George, & Dron, 2014). Incorporating a mix of collaborative activities can create the conditions for supportive relationships to grow among learners. Lack of connections between distance learners can result in minimal communication, leading to decreased motivation and feelings of isolation (Hartnett, 2015). Instructors also need to develop and maintain an online presence (Bekele, 2010) via regular contributions to online discussions and activities that are not limited to procedural and administrative information, but also incorporate content expertise. Offering guidelines and strategies for interaction are additional ways in which practitioners can model appropriate behavior in an inclusive, respectful community (Hartnett, 2016).

Developing Attitude

The second principle, *developing attitude* (Ginsberg & Wlodkowski, 2000), refers to the principles and practices that contribute to the development of a favorable disposition toward learning, thereby enhancing learner motivation. Norms, procedures and structures focus on encouraging personal relevance and choice based on individual experiences, values, strengths, and needs. By clarifying the relevance and value of the curriculum and making connections to the learning objectives, practitioners can help learners understand how they assist in the realization of personal goals and aspirations. Incorporating rationales for content and tasks that explain why the learning is important and encourage learners to make connections between the course content to their lives can enhance interest and relevance, and encourage personal involvement (Hartnett et al., 2014).

Situational interest (Hidi & Renninger, 2006) is a further approach practitioners can employ to develop a positive attitude among learners. It can be encouraged and sustained through the use of strategies such as the use of interesting learning methods (e.g., problem-based learning) to engage with curriculum content, offering learners choices to explore different pathways within a chosen strategy and supporting learners to engage with content from a range of perspectives. Additionally, collaborative opportunities, discussions centered on controversial topics, and encouraging learners to ask thoughtful questions can promote curiosity and pique interest. Designing authentic learning activities (e.g., simulations, scenarios, case studies) can promote immediate interest and encourage appreciation for what is being learned. Offering meaningful choices enables learners to pursue topics that align with what is important and interesting to them, which can further enhance relevance and motivation. In practical terms, choices can include students setting their own learning goals, the topic focused on, the approach taken, the resources accessed, the academic literature read, the technological tools used, choice of peers for collaborative activities and the presentation of work (Hartnett, 2016).

Enhancing Meaning

The third principle, *enhancing meaning* (Ginsberg & Wlodkowski, 2000), refers to the principles of challenge and engagement that include learners' perspectives and values. It expands and strengthens learning in ways that matter to students, including active participation in challenging ways, questions that go beyond facts to encourage different points of view, building on what students already know, and encouraging high-quality responses. Incorporating optimally challenging learning experiences, whereby the challenge of the task is high and aligned with a learner's level of skill (Csikszentmihalyi, 1985), support feelings of competence, satisfaction, and achievement that facilitate

positive motivation. Including increasingly difficult or complex activities provide scope for learners to develop skills and capability over time and help to manage feelings of anxiety which can undermine motivation to learn (Reeve, 2009).

Engendering Competence

The fourth and final principle, *engendering competence* (Ginsberg & Wlodkowski, 2000), refers to principles and practices that help students to develop a sense of efficacy that they can successfully master what is being asked of them and to attribute success or failure to factors that are within their control (e.g., effort and strategy use). Learners require sufficient information, guidance, and ongoing feedback to make accurate judgements of the requirements necessary for successful task completion. A key way to engender competence in distance learners is by incorporating positive structure in terms of the right quality, amount, and clarity of information. By providing guidelines and expectations that are clear, detailed, and explicit, practitioners can support learners' competence needs. Ongoing guidance and formative feedback, offered in a responsive and informative way (i.e., how to do it, and not just what to do), is also needed to ensure that individual learner judgements of capability remain high and self-attributions support ongoing learning. Providing opportunities for self-assessment of prior knowledge is another way to assist students in judging their capabilities.

The quality, relevance, and quantity of learning resources made available are important considerations, particularly in today's connected world. Sharing learning resources that assist learners in navigating the learning journey, relate directly to learning tasks, scaffold the development of activities to be assessed (e.g., templates, guided assignments), and assist learners in understanding the required standard of work (e.g., rubrics, exemplars) support the development of learner competence. Additionally, learners can assist each other within an online learning community. Asking for assistance from peers is valuable because tasks that may be perceived as too challenging to accomplish individually may be viewed as achievable with the help of more capable students (Vygotsky, 1978).

Learners who feel overly challenged (and question their self-efficacy as a result) may need more explicit structure and their progress monitored, as not all students will perceive they possess the required knowledge and skills to succeed (Hartnett, 2015). Explicit structure can include questioning that helps to determine current understanding, additional information for assessed tasks, regular feedback, suggestions of further resources to aid learning, exemplars that demonstrate the standard of work required, and checkpoints that aid progress toward activity completion.

The point to emphasize from these recommendations is that the motivation of distance learners needs to be considered as an integral part of learning design. Models such as the motivational framework for culturally responsive teaching (Ginsberg & Wlodkowski, 2000) and ARCS (Keller, 2010), as well other research (Bonk & Khoo, 2014; Hartnett, 2016), offer distance practitioners a systematic way of addressing the multi-faceted nature of motivation that encompasses individual learners, pedagogical practices, technological tools, and various contextual variables.

Conclusion

"As distance education continues to make inroads into the mainstream of educational and training practice at all levels, and in virtually every field of learning" (Moore, 2013, p. xiii), there is a need for practitioners to understand the complexities of motivation in order to design and develop quality learning experiences that foster motivation among learners. By using an organizing framework encompassing expectancy-value aspects of motivation to aid the understanding of complex theories, concepts, and evidence, it is hoped that this chapter has offered useful insights into the multi-faceted nature of student motivation and the important role of distance educators.

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12
THE ROLE OF ACADEMIC LIBRARIES

Elaine Fabbro and Jennifer Rempel

This chapter offers a guide to current key literature pertaining to the provision of distance learning library support in higher education. The literature is grouped into several areas: (a) connecting with users by promoting awareness of the library, providing reference services, assessing library services, and meeting the needs of diverse teachers and learners; (b) providing access to resources, particularly through e-resources, electronic course reserves, and document delivery; and (c) promoting information literacy (IL) by establishing institutional support, delivering IL instruction, developing relevant pedagogical approaches, and assessing IL skills. An overview of professional resources is provided at the end of the chapter to assist in further exploration of key issues in the provision of library support to distance learning communities.

Connecting With Users

The "access entitlement principle" is core to the highly influential "Standards for Distance Learning Library Services" (SDLLS) (ACRL, 2016). Equitable access to library services and resources, and direct communication with library staff, must be provided to learners, regardless of location or mode of learning. Technology has helped libraries meet this goal: the availability of online library resources has facilitated access to library collections, and contributed to the blurring of distinctions between on-campus and off-campus learners (ACRL, 2016; Huwiler, 2015). Technology has also impacted the ways libraries connect with users, and the roles of librarians in higher education (Abbott, Kreszock, Ochoa, & Purpur, 2013). Despite these improvements, challenges remain. Distance continues to be a barrier. To meet this challenge, librarians must be creative in making libraries more visible and present to distance learning communities and ensure they are meeting their needs.

Promoting Awareness of the Library

Librarians recognize that promoting library resources and services is crucial in creating successful programs, courses, and students, and this topic is discussed extensively in the literature. In distance education, the issue is perhaps more critical because faculty and students may not have physical access to campus resources and services, or be aware that they have access to a library. A list of strategies that can increase awareness of the library and its services can be found in Bonella, Pitts, and Coleman (2016).

In recent years, greater emphasis has been placed on student engagement and the student experience in higher education, and it must be considered in distance education, as well. Understanding

how distance learners want to interact with online learning environments (Palmer, 2012) and institutional services (Bonella et al., 2016) is important. Libraries are using a variety of methods to evaluate the effectiveness of tutorials and other online resources (Mitchell & West, 2016; Turner, Fuchs, & Todman, 2015; Nichols Hess, 2014). The needs of distance learners must be considered in the development of library strategic plans (Cannady, Fagerheim, Williams, & Steiner, 2013), as well, to ensure the delivery of appropriate services to these diverse learners.

Library promotional efforts must be directed at both students and faculty, with the latter focused on increasing awareness of the resources and services that are available among this key group. The library must be involved in all planning for distance learning programs, from development to revision (ACRL, 2016). Inclusion assists libraries in promoting services, and allows faculty to share information about the library with students. Promotion of library online resources and services helps to ensure that distance learners are not disadvantaged in completing assignments and courses. Librarians use a variety of techniques to promote the library, including online newsletters, social media such as Facebook and Twitter, and library training sessions or orientations. Increasingly, online conferencing technologies are used to deliver these sessions (Carlson, 2011). The promotion of specific resources such as e-resources is important (Fry, 2010; MacDonald, Vanduinkerken, & Stephens, 2008), but for the distance learner, services such as reference and instruction are equally important, as these services can help to initiate a communications link between the institution and its distance students, and provide much-needed personal support. Developing a marketing plan, and identifying clearly in advance the audience and expected outcomes of the promotional initiative, can help ensure success (Tremblay & Wang, 2008). Often the best way to promote the library to distance students is through embedded or integrated librarian programs in which librarians participate in online courses as co-teachers or resources for students, and provide information literacy instruction and reference services within the context of the discipline and the curriculum (Morasch, 2013; Tucci, 2011; Tumbleson & Burke, 2010).

Providing Reference Services

Providing reference services in a distance education environment can pose challenges for both students and librarians. An introduction to the provision of reference services in distributed learning can be found in Cantagallo, Dennis, and Reeg-Steidinger (2011). Where in a face-to-face library, the reference interview can be conducted in a relatively expedient fashion, reference assistance provided over email can take more time, and may involve a number of conversations before the student's "true" question is revealed (Jones, 2008). Libraries have begun expanding the modes through which they provide reference services to distance learners. These include instant messaging, chat, videoconferencing, and co-browsing (Li, 2013). These methods allow libraries to connect with learners in more personal ways and can reduce the time required to respond to student requests (Meulemans, Carr, & Ly, 2010).

Assessing Library Services

Assessment plays a crucial role for distance learning libraries striving to ensure that the research and information needs of their communities are met, and that support is equivalent to what is experienced on campus. Libraries must understand how students perceive the resources and services that are provided, and how they are used. The Association of College & Research Libraries (ACRL) "Standards for Libraries in Higher Education" (2011) advocate for assessment that employs both qualitative and quantitative methods, and notes that assessment may take a number of forms. Needs assessments identify service gaps, thereby aiding in planning. Outcomes assessments can evaluate the effectiveness of library practices in relation to the library's stated goals and objectives, and the extent

to which students are learning relevant skills. Assessment of distance learning library services may also demonstrate compliance with the standards of accreditation bodies (ACRL, 2016; Lewis, 2011). Most libraries supporting distance learning tend to perform some form of assessment, typically surveys of library users that are initiated annually or at longer intervals. An overview of some of the assessment literature can be found in Ritterbush (2014).

Increasingly, academic libraries are being asked by their institutions to demonstrate their value to student learning, and professional organizations such as ACRL are investing significant time and energy in attempting to assist their members in formulating a response. Megan Oakleaf's (2010) report, "Value of Academic Libraries," remains an important resource.

Meeting the Needs of Diverse Learners and Teachers

Distance education enables a teaching and learning environment that brings together widely dispersed teachers and students. Such communities may include considerable diversity socio-economically, culturally, demographically, and in learning styles. Librarians supporting distance learning seek to meet the needs of their diverse populations, including facilitating the extensive research needs of graduate students and faculty, supporting international students, and removing barriers for students with disabilities.

Brahme and Walters (2010) developed a study to compare the research practices and references of doctoral distance students with those of their residential counterparts. They found that the distance students were 40% more likely than residential students to want "easier contact" (p. 495) with the university librarians and, although the groups appeared equally knowledgeable about using the library, the distance students expressed much less confidence about their research skills. Studies of distance faculty have identified the need for better marketing of services to faculty (Kvenild & Bowles-Terry, 2011; Schmehl Hines, 2006), help with copyright, and outreach through library handouts and tutorials (Schmehl Hines, 2006).

Key trends affecting higher education and distance education include increasing globalization and internationalization (Walsh, 2009). A growing number of students are engaging in distance learning through online or site-based programs that cross national boundaries. Academic libraries are directing attention to how best to support the academic success of international students, and address challenges these students may face such as language and cultural barriers. In 2009, ACRL initiated the Academic Library Services to International Students Interest Group, which maintains a collection of resources for providing quality library support to international students. The Society of College, National and University Libraries (SCONUL, 2008) in the United Kingdom offers guidelines and best practices for supporting international students. Although these resources do not focus specifically on distance learners, there are many areas of overlap, such as designing library Web pages especially for international students, avoiding jargon, and providing library staff with diversity training (SCONUL, 2008). Providing library support to international distance learners includes additional challenges related to technology, time zones, bureaucratic hurdles, and the logistics of delivering resources and services. Helpful research has come out of Nova Southeastern University in Florida, including Ramdial and Tuñón's (2007) survey of international distance learners in Jamaica and the Bahamas.

To meet the needs of persons with disabilities, academic libraries must attend to issues such as resource accessibility, universal design principles, inclusivity, assistive technologies, appropriate reference and instruction services, broader institutional supports and policies, and relevant acts, laws, and regulations at national and local levels (Catalano, 2014). Such issues are discussed within ACRL's Universal Accessibility Interest Group (2011), and SCONUL has provided a detailed report for the United Kingdom on access for library users with disabilities (Robertson, 2012). The distance learning standards (ACRL, 2016) draw attention to the need to ensure equivalent access for distance users

with disabilities. Black's (2004) examination of implications for librarians supporting distance learners with learning disabilities is particularly helpful, as is the literature on issues related to accessibility of library websites and electronic documents, such as Vandenbark (2010) and Thompson (2009).

Providing Access to Resources

The information and communication environment continues to change, and the ways in which distance learners interact with libraries has changed, as well. Technology provides access through online journal databases, e-book collections, digital repositories, electronic course reserves, and electronic document delivery.

E-resources

E-resources have become an important part of academic library collections and the acquisition of these materials has become the focus of collection development policies, with libraries adopting an e-preferred model (Pickett, Tabacaru, & Harrell, 2014). Full-text content is common in journal databases, as is remote access via proxy server authentication for subscribing libraries. In addition, older articles from journals are now frequently available in journal databases. As a result, content that previously was available only in the physical holdings of large research libraries is now available electronically anytime and from anywhere, facilitating the equivalency of access for distance learning communities.

An increasing number of scholarly resources are being published in open access formats which do not require subscriptions and are freely available to anyone. In addition, open educational resources (OER) are gaining popularity in higher education, and libraries are increasingly called upon to support and collect these resources. The increase in the number of open resources poses both opportunities and challenges for distance users and librarians. The sheer volume of information and sources can be overwhelming. Whereas scholarly resources were once available only from library collections, open access resources are available through countless online sources such as institutional repositories and open access initiatives, which may or may not be familiar to users and librarians. While tools such as Google Scholar can facilitate access to some of these open resources (Hartman & Bowering Mullen, 2008), more can be done to provide greater access to these resources (Elliott & Fabbro, 2015; Hutton, 2008). Strong critical evaluation skills are essential in navigating through the plethora of open access resources.

While electronic resources can ease access to resources for those who are geographically separate from their home institution, challenges related to technology itself remain. Digital technology can create obstacles, when its users struggle with inadequate connectivity and equipment, inability to effectively use the systems, and feelings of isolation in the absence of human interaction. The literature is rife with discussions of the digital divide, which is commonly understood as the difference between those who can and cannot access technology for a variety of reasons, including economic ones. However, as Burgstahler (2002) notes, for students with disabilities, electronic resources pose a second difficulty because many do not present materials in a way that are accessible to assistive technologies.

Electronic Course Reserves

Electronic course reserves (e-reserves) provide students with online access to the required and optional readings designated for their courses. Since their introduction in the 1990s, e-reserves have become a staple of higher education by providing convenient access to course readings for both off-campus and on-campus students. Resources such as journal articles, book chapters, lecture notes, images,

streaming video, podcasts, and interactive tutorials can be accommodated. E-reserves may link to digital content, licensed through the library's subscriptions or freely accessible on the Web, and they may involve scanning from print sources. Many different systems are available, from commercially available products, to systems designed in-house, to course management systems. The library's role in providing, maintaining and supporting e-reserves varies from institution to institution. E-reserves are prized for their accessibility, efficiency, and added value. At the same time, there are workload, staffing, and copyright concerns. Cheung, Thomas, and Patrick's (2010) "New Approaches to e-Reserve: Linking, Sharing and Streaming" provides a helpful introduction to e-reserves.

The e-reserves landscape has undergone significant change in recent years (Goodson & Frederiksen, 2011). Some libraries are retaining or expanding these services, while others have discontinued them. Increasingly, course management systems are the preferred method of delivery for course readings, rather than an e-reserve system managed by the library, because faculty members can more easily serve themselves and students have a more integrated access to resources. The discussion around best practices in providing access to course resources is an important topic in the literature (Blankenship & Wood, 2009; Clumpner, Burgmeier, & Gillespie, 2011; Li & Demers, 2010). Considerations in providing e-reserves include the need to have processes for ensuring links to online resources are kept up to date; also, there is increasing awareness of the importance of teaching students to locate their own resources, rather than providing them with preselected links to all they need in a course.

Another key issue is that of copyright and the need to develop institutional policies and practices for e-reserves that meet faculty and student needs without risking litigation in a complex digital environment. Introductions to U.S. copyright law and its applications in e-reserves, interlibrary loan, and document delivery in a distributed learning environment can be found in Clark (2011) and Schlipp (2011). A history of the e-reserves environment in the United States and scenarios for the future can be found in Almeida (2014). Buller (2014) discusses the Association of Research Libraries "Code of Best Practices in Fair Use in Academic and Research Libraries" and the implications for e-reserves. Copyright law varies by nation, and is impacted by a number of factors, including trade agreements. The not-yet-signed "Trans-Pacific Partnership" has a chapter on intellectual property which, if the agreement is ratified, will extend the length of copyright terms in some countries. In turn this may impact the ability of libraries to provide access to resources.

Document Delivery

The availability of online full-text journal articles and e-books has impacted interlibrary loan and document delivery. Behr and Hayward (2008), in their Western Michigan University case study and survey of U.S. libraries, found a significant decline in distance learners' demand for print-based journal articles, with demand for print books showing only a moderate decline. However, while many resources are available electronically, delivery of physical library materials continues to be important in ensuring equitable access to library support. Declining collections budgets in academic libraries may result in an increase in the number of document delivery and interlibrary loan requests. The literature offers best practices for removing barriers for remote borrowers, and maximizing the benefits derived from electronic delivery options (Hosburgh & Okamoto, 2010; Long, 2009).

Promoting Information Literacy

The ACRL's SDLLS (2016) emphasizes the importance of providing IL instruction to distance learners in accordance with the "Information Literacy Competency Standards for Higher Education" (ACRL, 2000), an immensely influential document that provides an extensive outline for "assessing the information literate individual" (p. 5). Although rescinded in 2016, and replaced with the "Framework for Information Literacy for Higher Education" (2015) (Framework), the Standards

(ACRL, 2000) remain a seminal document. Lohmann (2015) provides a brief description of how the Framework departs from the Standards, and a review of the literature surrounding library professionals' responses to the Framework. The *College and Research Libraries News* bi-monthly column "Perspectives on the *Framework*" provides insight into librarians' thoughts on the Framework. The inaugural editorial was written by Drabinski for Issue 8, Volume 77 (2016).

IL is defined by ACRL (2015) as "the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning." IL directly influences student persistence and success, and accrediting bodies in the United States commonly address the concept (Reichart & Elvidge, 2015).

Establishing Institutional Support

The importance of institutional support for IL initiatives cannot be overstated. While it may be tempting to consider IL a "library skill," it in fact goes far beyond this to incorporate skills across a range of disciplines and includes critical reading, evaluation, and analysis of information and sources. Therefore, IL must be viewed as integral to the curriculum rather than as an add-on to it. This emphasis can be encouraged through broad-based institutional support from both administration and faculty.

There are a number of documents which can assist in the development of institutional support, including ACRL's Framework (2015), and the SDLLS (2016). These documents identify the role of higher education in promoting IL, but also remind us that an important goal of higher education is fostering lifelong learning, of which IL is a component. The references to IL in the criteria established by accreditation bodies can be useful in increasing the prominence that IL has on campus at the administrative level, but faculty must also recognize its importance so as to more consistently allow for curricular integration in pedagogically appropriate ways.

Faculty/librarian collaboration is crucial in establishing institutional support. The literature provides an abundance of suggestions for best practices in establishing a collegial working relationship between faculty and librarians, and examples of effective collaboration efforts (Cassidy & Hendrickson, 2013; Reichart & Elvidge, 2015). As trust and respect are two crucial elements of collaboration, common goals and common understanding are important. Ideally, collaboration should result in alignment with the strategic goals of the institution, thereby encouraging further institutional support for IL initiatives (Kumar & Heathcock, 2016). Strategies for developing relationships with faculty include attending faculty presentations, offering to conduct a library orientation for students, and participating in faculty committees (Owens & Bozeman, 2009). In becoming a known and thoughtful presence, the foundation for collaboration is being built.

Delivering Information Literacy Instruction

IL instruction for distance students is provided in a variety of ways using different technologies. While some libraries are able to offer in-person IL training to their distance students in the form of so-called one-shot sessions, institutional factors may preclude this approach. In addition, some literature questions the efficacy of these sessions in a distributed environment, recommending instead point of need IL instruction that is directly relevant to specific assignments or tasks (Gersch, Lampner, & Turner, 2016; Edwards & Black, 2012).

As a result, librarians and their institutions are exploring the use of alternative methods to provide IL instruction to their distance learners. These methods include the use of synchronous Web conferencing software such as Adobe Connect (Badia & Colosimo, 2013; Riedel & Betty, 2013) and GoToMeeting (Eva, 2015). Li (2014) provides an overview of Web conferencing tools. The use of

video games in asynchronous IL instruction is becoming increasingly popular (Felker, 2014; Kim, 2015; Markey, Leeder, & Taylor, 2012), while a near-ubiquitous means of providing IL instruction in a distance environment is through Web-based tutorials. Tutorials must meet the needs of students with diverse learning styles, and must be accessible to all. They may be video-, text- or activity-based (Courtney & Wilhoite-Mathews, 2015). In recent years, there have been efforts in the library community to establish best practices for creating and updating tutorials, especially given the increasing number of online students and availability of electronic resources (Keba, Segno, & Schofield, 2015). Although software for creating tutorials is becoming increasingly user-friendly (Scales, Nicol, & Johnson, 2014), creating tutorials can be time consuming even for staff who are familiar with the software (Resor-Whicker & Tucker, 2015). Many academic libraries are using technologies such as LibGuides, which allow for easy creation and maintenance of tutorials that can include a range of different media types, and allow for student interactivity (Baker, 2014; Jackson & Stacy-Bates, 2016; Ream & Parker-Kelly, 2016). Tutorials should be complementary to other IL activities, rather than stand-alone tools. Increasingly, tutorials are integrated into learning management systems, assignment instructions, or the assignments themselves (Burke & Tumbleson, 2016a; Mune et al., 2015).

Embedded librarian programs, in which the librarian participates in course conference boards and acts as a resource for the students within the course, provides another option. In some circumstances, embedded librarians are team teachers or co-teachers (Tumbleson, 2016). This has proven an effective means of providing IL instruction (Edwards & Black, 2012; Reichart & Elvidge, 2015), and of addressing new challenges in higher education, such as the need to improve students' digital literacy (Burke & Tumbleson, 2016b). However, embedded librarianship can have serious workload implications, especially in an environment of decreasing staff and funding (Tumbleson & Burke, 2010). Another frequently used method is the development of for-credit online IL courses designed to teach students about the different facets of the information landscape (Catalano, 2015; Reichart & Elvidge, 2015). Librarians can also work closely with faculty to build IL instruction into their courses and assignments. Ultimately, the integration of IL skills instruction directly into the curriculum provides the context needed to help students understand the relevance of these skills (Reichart & Elvidge, 2015).

Developing Relevant Pedagogical Approaches

Careful consideration of pedagogical approaches, learning theories, and instructional design helps ensure that IL instruction meets the needs of distance learners. Mestre et al. (2011) note the need for librarians to meet the challenge of engaging students effectively in online learning environments if students are to become information literate. Understanding how students perceive and experience information can help librarians and educators develop effective online tutorials that meet differing learner needs. In assessing the effectiveness of online tutorials in accommodating diverse learning styles, Mestre (2010) points to the need for learning objects that address multiple modalities: visual, auditory, and kinesthetic. Librarians and learning designers are increasingly applying universal design for learning (UDL) principles to the creation of online learning objects (Catalano, 2014; Tobin, 2014; Webb & Hoover, 2015). Learning objects are discussed extensively by Courtney and Wilhoite-Mathews (2015).

The ACRL's adoption of the Framework (2015) in 2016 acknowledged the need for librarians and educators to move toward pedagogical approaches based on students' mastery of "threshold concepts," "rather than on a set of standards or learning outcomes, or any prescriptive enumeration of skills" (p. 2). IL instructors and learning designers have begun to adapt their pedagogical approach to include models of online instruction that support the Framework (Gersch et al., 2016; Mullins, 2016; Reichart & Elvidge, 2015). The literature in this area can be expected to grow in the coming years as the *Framework* is increasingly incorporated into IL instructors' methodologies.

IL instructors increasingly recognize the limitations of a disconnected, fragmented skills focus. Many alternatives can be found in the literature. Ovadia (2010) applied "writing in the disciplines" concepts to an online research class in which students used writing as a means to learn and demonstrate IL. Inquiry-based learning taps into natural human curiosity to engage students in the act of inquiry as they formulate questions, build new knowledge, gain deeper understanding, and develop solutions. "Sok & Skriv" ("Search & Write"), an online IL tutorial for distance learners in Norway, uses a social-constructivist approach to "promote student learning by doing and reflecting," and to encourage knowledge construction within the context of social interaction (Skagen et al., 2008, p. 89). The "flipped classroom," an increasingly popular inquiry-based approach, has been adapted for distance learners by Hawes and Adamson (2016) and Obradovich, Canuel, and Duffy (2015), respectively. Duke, Ward, and Burkert (2010) have combined understandings from critical pedagogy, and its focus on the importance of raising critical consciousness and creating empowerment, with IL instruction for teachers in a distance-delivered master's program in special education. The Community of Inquiry framework, "perhaps the most widely accepted model of online learning" (Weissman & Swan, 2013, p. 154), is particularly useful for synchronous Web-based instruction. Catalano (2015) used situated learning theory to develop a one-credit, nine-week online introductory library research and technology course. Situated learning theory is a theory of knowledge transfer based upon situated cognition and cognitive apprenticeship, in which an instructor "models a skill while appropriately diminishing and then releasing support for a learner" (p. 653).

With increasing demands to develop online learning objects and courses, deliver online instruction, and collaborate with faculty, librarians must be well versed in pedagogical theory and instructional design. A number of resources have been developed to help librarians improve their knowledge in this area. *Practical Pedagogy for Library Instructors: 17 Innovative Strategies to Improve Student Learning* uses case studies covering behavioral, cognitive, and constructivist approaches to help librarians learn how pedagogical theory can inform their instruction in the classroom and online (Cook & Sittler, 2009). The two-volume *Critical Library Pedagogy Handbook*, edited by Pagowsky & McElroy (2016), aims to provide library educators with an accessible introduction to critical pedagogy, as well as lesson plans and activities that can be adapted to a variety of teaching environments. Librarians have also created in-house professional development opportunities and resources to support colleagues' teaching and learning (Bliquez & Deeken, 2016; Mune et al., 2015). A movement toward inter- and intra-institutional collaboration on and sharing of online learning objects is also growing (Courtney & Wilhoite-Mathews, 2015; Mune et al., 2015)

By supplementing the library literature with research, theory, and educational philosophy from the fields of distance education and adult education, distance learning librarianship can develop a robust and relevant approach to IL instruction.

Assessing Information Literacy Skills

In addition to assessing library services, student's IL competencies must also be gauged in order to determine the effectiveness of the instruction they are receiving. Consisting of six frames, the Framework (ACRL, 2015) establishes concepts "central to information literacy," knowledge practices, and dispositions (p. 2) that learners must develop, but does not prescribe IL assessment methods or outcomes. Rather, it is a guiding document for developing local resources and methods for assessing students' IL skills within the context of an institution's mission. The SDLLS (ACRL, 2016) note the importance of measuring students' library knowledge, and the assessment of student learning is an important concern of U.S. accreditation bodies. There is a considerable body of literature on IL assessment in general, and librarians are increasingly developing assessment methods based upon the concepts espoused in the Framework (Mullins, 2016; Reichart & Elvidge, 2015).

Professional Resources

The role of the distance librarian is continually evolving, and these librarians are increasingly expected to take on new and more varied roles, including such positions as virtual reference librarian, instructional design librarian, even avatar librarian (Abbott et al., 2013). For librarians and others seeking information and research about library support for distance learning, there are many valuable professional resources, including databases, bibliographies, citation and content analyses, conferences and their proceedings, and professional organizations.

Three of the best databases for research within the field of library and information science are Library Literature & Information Science Full Text, Library and Information Science Abstracts (LISA); and Library, Information Science & Technology Abstracts with Full Text (LISTA). Relevant research can also be found in education databases such as ProQuest Education Journals and ERIC (Education Resources Information Center), and in other databases such as Emerald Full Text and Taylor & Francis Online. These databases are available by subscription, but EBSCO Industries (2016) offers a complimentary LISTA index and ERIC is available at no charge through its sponsor, the Institute of Education Sciences of the United States Department of Education (n.d.). The *Journal of Library & Information Services in Distance Learning* is particularly notable within the journal literature, as its primary focus is provision of library services and resources in distance learning. This peer-reviewed, quarterly publication provides articles, essays, reviews, and research reports addressing a variety of issues in distance learning librarianship with an international scope.

Although bibliographies quickly become dated, they are very useful for discovering core subjects and literature, and for acquiring historical and contextual perspective. *Library Services for Distance Learning* is a key bibliographic tool in distance learning librarianship. This free online annotated bibliography continues the work of the three print bibliographies (Latham, Slade, & Budnick, 1991; Slade & Kascus, 1996, 2000) and is available as *The Fourth Bibliography* (ACRL Distance Learning Section, 2006–2008), which is continued by *The Fifth Bibliography* (ACRL Distance Learning Section, 2008–2010). *The Sixth Bibliography* is currently under construction. The bibliography organizes research and other literature in a number of broad categories, including bibliographies, general works, the role of libraries, organizational issues, managing e-resources, document delivery, IL, interlibrary cooperation, surveys, user studies, and case studies.

Citation and content analyses offer another important guide to the professional literature, providing insights into key subjects, issues, trends, authors, journals, and research methodologies. One study comes from Susan Herring (2010), who analyzed the citations, abstracts, and subject indexing of 472 articles focused on library services in distance education published in English from 1999 to 2009. Earlier studies include Reiten and Fritts (2006) and Slade (2004).

Conferences and their proceedings are rich sources for sharing ideas and research in the field. Distance Library Services (formerly known as Off-Campus Library Services) is one of the most important conferences for practitioners and administrators of distance learning library services. This biennial conference, sponsored by Central Michigan University, was first held in 1982. Past conference proceedings are available from the university in digital form for free, or print form for a fee, and the proceedings have been published in special issues of the *Journal of Library Administration*.

Conferences from the fields of librarianship and distance education, such as the American Library Association Annual Conference and the Annual Conference on Distance Teaching & Learning, sponsored by the University of Wisconsin, often regularly include presentations, workshops, or proceedings of relevance to the provision of distance learning library services. There are a number of excellent conferences dedicated to IL including the annual LOEX (Library Orientation Exchange) conference in the United States, the annual WILU (Workshop for Instruction in Library Use) conference in Canada, and the Librarians' Information Literacy Annual Conference (LILAC) in the United Kingdom.

Professional organizations are an important source of communication, professional development and leadership. Established in 1991, the Distance Learning Section (DLS) of ACRL is the most prominent professional organization in distance learning librarianship in North America. Perhaps the most significant contribution of the DLS has been its development of the SDLLS, which provides important direction to academic libraries serving distance learning users (ACRL, 2016). The DLS performs many functions through its different committees and projects, including publishing the Library Services for Distance Learning bibliography. DLS facilitates communication and research among distance education librarians through the DLS Discussion Group and programs at conferences, and the work of the Research Committee in encouraging research activities and in identifying areas where research is needed.

ACRL's Regional Campus Libraries Discussion Group provides another venue for exchanging information and networking, with a focus on physical and virtual regional campuses. In addition, the Distance Learning Interest Group of the Library and Information Technology Association (LITA) offers professional development resources in distance librarianship, with a particular focus on the application of technologies to the provision of distance learning library services and resources. The OFFCAMP listserv, from the University of Tennessee-Knoxville, is a predominant resource for discussions among distance librarians. Other valuable professional development resources can be found within groups that are not specifically dedicated to distance learning librarianship such as the Instruction Section of ACRL which is responsible for the ILI-L Discussion List, a tool for facilitating the exchange of information about IL and library instruction among librarians.

Conclusion

This is a challenging but exciting time for academic libraries supporting distance learning. As they face significant funding constraints, distance librarians find themselves trying to do more with less, working with staffing shortages, and needing to make important strategic decisions about services and resources. This is at a time when the number of distance learning graduate programs is growing; universities are positioning themselves to meet the educational needs of greater numbers of international students; a generation of students that is used to always being connected, networked, and mobile is working its way through higher education; and awareness of the value of the academic library in relation to student success and retention is increasing. The boundaries between serving distance learners and on-campus students are blurring as, regardless of location, students increasingly use libraries remotely due to the availability of extensive, full-text online collections and virtual reference and instruction services. Macauley and Green (2008) refer to this phenomenon as "the convergence of off-campus and on-campus library services" (p. 368).

Faced with these complex realities, those involved in distance learning librarianship will now more than ever need to access the knowledge gained through research and experience, and contribute to this knowledge base, to ensure an informed and innovative approach to meeting the needs of diverse distance learning communities. The literature surveyed in this chapter provides examples of the creativity and flexibility of distance librarianship in facilitating successful teaching and learning experiences by connecting distance users with their libraries, meeting their needs for research and learning resources, and providing them with opportunities to develop their information literacy abilities.

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13

CURRENT RESEARCH IN BLENDED LEARNING

Charles R. Graham

Background and Definition of Blended Learning

Blended learning (BL) is being adopted worldwide in higher education, corporate training, and K-12 education. Many have predicted that BL would "emerge as the predominant model of the future" (Watson, 2008, p. 3), become the "new traditional model" (Ross & Gage, 2006, p. 167), or the "new normal" in course delivery (Norberg, Dziuban, & Moskal, 2011, p. 207). The first section of this chapter will explore how BL is being defined and what we know about its adoption pace.

Definition of BL

Despite its current popularity, the term *blended learning* is defined variously across institutions (some using the term *hybrid*). Researchers have expressed frustration over unclear definitional contours of the BL ecosystem (see Oliver & Trigwell, 2005; Teng, Bonk, & Kim, 2009), and much of the early research in BL has attempted to describe and chart its boundaries. In the third edition of this *Handbook* (see Graham, 2013), more space was given to exploring definitional questions:

1. What is being blended?
2. Should reduced seat time be part of the definition?
3. Should the quantity of online instruction be part of the definition?
4. Should quality factors be part of the definition?

In the past five years, definition issues in higher education have changed little. However, in the K-12 sector, where online instruction often occurs within brick-and-mortar schools, the Clayton Christensen Institute has popularized a definition emphasizing an "element of student control over time, place, path and/or pace" in the online portion of the blend, as well as the importance of integrated instruction between the online and face-to-face modalities (Horn & Staker, 2014, p. 34).

Because researchers have little control over the definition of an organically developing term, *blended learning* might be viewed as a boundary object (Norberg et al., 2011): an element shared across communities of practice, "plastic enough to adapt to local needs and constraints, yet robust enough to maintain a common identity across sites . . . weakly structured in common use . . . strongly structured in individual site-use" (Star & Griesemer, 1989, p. 393).

Agreement seems widespread that BL integrates face-to-face and online learning. Beyond that, individual researchers and institutions differ in limiting definition boundaries. Some require a reduction in face-to-face seat time, while others specify levels of online or face-to-face instruction. In a review of the BL literature and implementation practices in the United Kingdom, researchers recognized benefits to a broadly structured definition:

> We noted from the interviews that some institutions have developed their own language, definitions or typologies to describe their blended practices. We suggest that this poor definition [of blended learning] may be a strength and part of the reason why the term is being accepted. The lack of definition allows institutions to adapt and use the term as they see fit, and to develop ownership of it.
>
> *(Sharpe, Benfield, Roberts, & Francis, 2006, p. 17)*

In this chapter, blended learning will be defined as learning experiences that integrate face-to-face and online instruction (Graham, 2006, 2013). Accepting such a broad definition of BL forces researchers to describe models of BL more clearly and to study specific models and pedagogies used in BL contexts.

Growth of BL

Despite widespread anecdotal evidence of BL adoption across education sectors, quantifying adoption rates has proven difficult. Reasons for the difficulty include: (a) different institutions define BL differently; (b) most institutions lack formal mechanisms for labeling BL courses; and (c) the choice to blend is often made by instructors without institutional oversight.

At the university level, early survey research of faculty, designers, and administrators (N = 562) found that 93% of the respondents were already using BL in some way, although approximately 60% were using BL in 20% or fewer of their courses (Bonk, Kim, & Zeng, 2006). These findings were limited in generalizability because the survey respondents were all early adopters of online technologies. At about the same time, the e-learning Guild (2003) reported 85.2% of organizations participating in their corporate training (N = 192) were using BL solutions, with 33.9% using BL in 20% or fewer of their courses.

For over a decade, the Online Learning Consortium (formally the Sloan Consortium) has sponsored survey research tracking online use in higher education in the United States. In one of the early reports, data were collected from chief academic officers (N = 994) to disambiguate blended learning from online learning in general (Allen & Seaman, 2003). The report defined BL as having 30–79% of content delivered online and online learning as 80+% online delivery. Researchers found that 55.6% of institutions offered both blended and online courses, 9.6% offered only blended courses, 16% offered only online courses, and 18.8% offered neither (Allen & Seaman, 2003). A few years later, the U.S. Department of Education commissioned a study of distance education in degree-granting postsecondary institutions, asking specifically about courses "formally designated" as hybrid/blended online—defined as "a combination of online and in-class instruction with reduced in-class seat time for students" (Lewis & Parsad, 2008, p. 1). The study found that 35% of institutions offered blended courses and that out of 12.2 million distance education enrollments, 12% were in blended courses.

At the K-12 level, the *Keeping Pace with K-12 Online Learning* reports (www.kpk12.com/reports/) have provided a broad view into K-12 online learning practices in the United States since 2004. The 2011 report noted that "most district programs are blended, instead of fully online," but the reports do not provide numbers that distinguish between blended and fully online (Watson, Murin, Vashaw, Gemin, & Rapp, 2011, p. 4). Picciano and Seaman (2007, 2009, 2010; Picciano, Seaman, Shea, & Swan, 2012) have conducted three national surveys that distinguished the extent of the blended

growth from fully online growth in U.S. K-12 institutions. Their survey of U.S. district school administrators (N = 366) revealed that during the 2005–2006 school year, 32.4% of districts had at least one student taking a blended course, with 27.1% additional districts planning to implement blended courses in the coming three years (Picciano & Seaman, 2007). A follow-up survey a couple of years later (N = 808) indicated that 41% of districts were implementing BL, with 21.2% additional districts planning to implement in the following three years (Picciano & Seaman, 2009). Additionally, the 2009 report showed that of the approximately 23,000 blended enrollments, 1% were in grades K-5, 20% in grades 6–8, and 78% in grades 9–12. The 2010 survey, which focused specifically on high school administrators (N = 441), showed that 38% had at least one student enrolled in a blended course (Picciano & Seaman, 2010).

Blended Learning Models and Theory

Models and theory provide a common language and focus for scholarly communities creating and extending knowledge (Dubin, 1978). Burkhardt and Schoenfeld (2003) noted that a "reasonably stable theory base . . . allows for a clear focus on important issues and provides sound (though still limited) guidance for the design of improved solutions to important problems" (p. 6) and that "a lack of attention to coherent theory building leaves us looking balkanized and incoherent, the whole . . . being less than the sum of its parts" (p. 13). In model and theory development, the BL domain is in its adolescent years, with important maturing needed ahead (Graham, Henrie, & Gibbons, 2014). Like related domains, including distance education (Moore, 2004) and educational technology (Roblyer, 2005; McDougal & Jones, 2006), BL research must overcome its growing pains and improve its research quality by focusing more directly on models and theories.

Models and taxonomies of BL may also provide guidance for practitioners. The third edition of this handbook presents several of the most prominent BL models for K-12, higher education, and corporate training contexts (Graham, 2013). The Horn and Staker (2014) taxonomy of blends, which has evolved in minor ways, continues to provide the dominant language and terminology of practitioners and advocates for K-12 blended learning. In higher education and corporate training, few new models have been developed, and current models tend to focus on surface-level physical dimensions of the learning environments, with a few very general high-level pedagogical approaches. Future models to need to focus more directly on pedagogical rather than physical dimensions of the blend. Graham et al. (2014) systematic review of models and theory in blended learning research categorized them into three distinct types proposed by Gibbons and Bunderson (2005): *explore*, *explain*, and *design*. Theoretical frameworks such as the Community of Inquiry, with constructs of social, teaching, and cognitive presence, continue to be widely used (Garrison & Vaughan, 2008; Kineshanko, 2016).

While some of the research in BL is solidly grounded in theory, most of it has sought to describe or solve localized challenges without contributing to coherent theory development. Many studies consider theory only as background or as a lens to describe findings or outcomes; few attempt to contribute substantively to the conversation around theory. Just as distance learning required theory to focus researchers on psychological rather than physical distance (Moore, 2013), BL needs theories to focus scholarship on the substantive psycho-social issues that make it distinct.

Blended Learning Research

Research related to blended learning is rapidly increasing. Drysdale, Graham, Spring, and Halverson (2013) identified and analyzed over 200 English language dissertations studying blended learning practices. Similarly, Halverson, Graham, Spring, and Drysdale (2012) identified the most cited journal articles, book chapters, books, white papers, authors, and journals publishing blended learning research, following up with a thematic analysis of the research questions and inquiry methodologies

used in the studies to identify strengths and areas for future research (Halverson, Graham, Spring, Drysdale, & Henrie, 2014). Because fewer than 5% of the articles in the Drysdale et al. (2013) and Halverson et al. (2012, 2014) studies focused on blended learning issues and contexts outside of North America, Spring, Graham, & Hadlock (2016) as well as Spring & Graham (2016, 2017) conducted a series of studies to better understand the landscape of BL across seven worldwide regions. This group interviewed international researchers, locating the most cited articles and authors and using a network analysis to identify citation patterns and themes. While it is too ambitious to cover all of the emerging BL research themes, this section will address some of the most important research related to institutional issues, faculty issues, and student issues.

Institutional Issues

Educational institutions are in the crossroads of change, with increasing pressures to effectively meet the needs of a larger and more diverse group of students. Top institutional issues include institutional change and adoption, learning access, and cost effectiveness.

Institutional Change and Adoption

Blended learning can influence institutions' capacity to meet strategic goals such as increasing student access, maintaining student success and satisfaction, and managing growth (Dziuban, Hartman, Cavanagh, & Moskal, 2011). Adoption of BL is increasing across institutions, but generally through extension of existing practice rather than radical change (Collis & van der Wende, 2002). Significant interest has been shown in how institutions can provide leadership supporting effective BL adoption and implementation (Moskal & Cavanaugh, 2014).

Minimal research exists on K-12 institutional adoption of BL. However, the book *Blended: Using Disruptive Innovation to Improve Schools* (Horn & Staker, 2014) includes institutional strategies focused for administrative stakeholders around the theory of disruptive innovation. For higher education, a 2013 special issue of *The Internet and Higher Education* focused on BL policy and implementation (Owston, 2013). In this issue, Taylor and Newton (2013) studied facilitators and barriers to institutional BL implementation, including the central role of senior leadership in that process. Garrison and Vaughan (2013) documented two case studies of Canadian institutions where institutional vision and leadership provided sustained support and resources, enabling the institutions to better realize their missions. Additionally, Graham, Woodfield, and Harrison (2013) studied six higher education institutions and developed a three-stage framework for institutional adoption, with 12 indicators across the categories of *strategy*, *structure*, and *support*. This framework was applied in two follow-up studies looking at the institutions' transition from the *awareness/exploration* phase to the *adoption/early implementation* phase (Porter, Graham, Spring, & Welch, 2014), and at institutional decisions facilitating or impeding the adoption of BL practices among faculty (Porter, Graham, Bodily, & Sandberg, 2016).

Access to Learning

Access issues drive much of BL's worldwide growth. Bloemer and Swan (2015) studied *informal blending* (students completing their degrees with both online and campus-based courses), determining that students' average credit hours taken per semester was increasing because of improved access. A 2007 survey of 366 U.S. school districts, representing approximately 3,632 schools and 2 million students, identified five primary reasons for online and BL options:

1. Offering courses not otherwise available.
2. Meeting needs of specific student groups.

3. Offering advanced placement or college-level courses.
4. Reducing students' scheduling conflicts.
5. Enabling failed courses to be retaken (Picciano & Seaman, 2007, p. 9).

All of these reasons involve access to educational opportunities that would be too costly to provide in traditional ways. Online and blended options can thus address small and rural schools' needs, as well as diverse students' needs like advanced placement and credit recovery. A BL initiative at Rochester Institute of Technology (RIT) targeted students who were deaf or hard of hearing, as well as English language learners (ELLs) (Long, Vignare, Rappold, & Mallory, 2007), improving access to classroom participation as discussions shifted from the face-to-face contexts to asynchronous discussion forums. Satisfaction levels for both subgroups were higher than for the general student population.

In higher education, costs for participating in traditional learning options are too high for many potential students whose work, family situation, or other commitments preclude a rigid school schedule. Flexible online options reduce costs associated with time and place scheduling, but many forfeit access to a high-touch, relationship-oriented environment with instructors and peers. BL options provide opportunities for benefit/cost tradeoffs relevant to students' individual circumstances and preferences. Blended options may particularly interest institutions reaching out to nontraditional learners in local communities where they are well known and trusted; this idea, called *localness*, has been emphasized by Sloan Consortium grant funding (Mayadas & Picciano, 2007).

Cost Effectiveness

Cost effectiveness drives higher education institutions toward BL approaches (Betts, Hartman, & Oxholm, 2009). With BL courses, the University of Central Florida has lowered costs by improving scheduling efficiency and reducing need for physical infrastructure (Dziuban, Hartman, Moskal, Sorg, & Truman, 2004; Dziuban et al., 2011). The National Center for Academic Transformation supported early research to determine whether universities could engage in large-scale course redesign that would decrease cost and improve learning outcomes (www.thencat.org). They offered $6 million in grants to 30 institutions to engage in course redesign with detailed cost analysis. Half of the designs included BL with reduced classroom seat time, seven involved significant technological enhancements with no reduction in seat time, and eight moved completely online with some optional face-to-face class sessions (Graham & Allen, 2009). Twigg (2003) reported total cost savings across all the projects of $3.6 million each year, with institutional reductions ranging from 20% to 84%, with an average savings of 40%. The projects reported quality improvements including completion rates, student satisfaction, retention rates, and attitudes toward subject matter.

Historically, corporations have more effectively reported cost effectiveness than higher education institutions. However, Blain (2010) reported that only 3% of global companies and 26% of European companies measure return on investment (ROI). A large-scale study by Bersin and Associates (Bersin, 2004) of BL training programs in 16 large corporations found that almost all generated an ROI of 100% or better. Blended programs reduced costly training inefficiencies in wait time, hours and salaries, and facilities, among others. Institutions reporting significant ROI due to BL training included Avaya (Chute, Williams, & Hancock, 2006), Microsoft (Ziob & Mosher, 2006), IBM (Lewis & Orton, 2006), and Intel (Mahesh & Woll, 2007).

Student Issues

Students are the main clients of blended learning solutions. Their learning issues include effectiveness, engagement, and satisfaction.

Learning Effectiveness

The first important student issue relates to the effectiveness of BL as an environment for helping students learn. A challenge inherent in this question deals with which characteristics of learning environments have the potential to directly impact learning. Media studies resulting in "no significant difference" have taught researchers that although the physical affordances of an environment can enable or constrain particular pedagogical methods, the active ingredient in learning is the pedagogy rather than the medium (Clark, 1983). Although the physical characteristics of learning environments (e.g., online or face-to-face) are not causal factors, they may represent classes of pedagogies distinct enough that differences may be measured in meta-analyses where actual causes have not been identified.

At least five published meta-analyses have looked specifically at BL as a moderating variable. Zhao et al.'s (2005) meta-analysis considered 12 moderating factors and found that instructor involvement (76 studies) had the greatest impact, largely enabling "studies that used a combination of technology and face-to-face education [to produce] the most positive outcomes" (p. 1863). A meta-analysis by Sitzmann, Kraiger, Stewart, and Wisher (2006) compared effectiveness of Web-based instruction (WBI) and BL with classroom instruction (CI). Outcomes in declarative (104 studies) and procedural knowledge (18 studies) were analyzed separately: BL was determined more effective than CI, with effect sizes of +0.34 for declarative and +0.52 for procedural knowledge. BL effects on outcomes were much larger than the effect sizes for pure WBI compared with CI, which were +0.07 for declarative and −0.15 for procedural knowledge. Additionally, Bernard et al. (2009) conducted a meta-analysis of distance education (DE) courses that compared synchronous DE (five studies), asynchronous DE (37 studies), and mixed DE (i.e., blended; seven studies), finding no significant difference among the modalities. However, the low number of studies in the non-asynchronous categories suggested need for further research.

The U.S. Department of Education sponsored a meta-analysis considering contrasts between online and traditional face-to-face learning (Means, Toyama, Murphy, Bakia, & Jones, 2010; Means, Toyama, Murphy, & Baki, 2013), with 50 different contrasts from 45 published studies. In 21 of the 50 cases, online learners had opportunities for face-to-face contact with an instructor; these were considered BL. The primary findings of the study claimed that "classes with online learning (whether taught completely online or blended) on average produced stronger student learning outcomes than did classes with [only] face-to-face instruction. The mean effect size for all 50 contrasts was +0.20, $p < .001$" (p. 18). When the data were disaggregated to compare the effects from the purely online contrasts (29 cases) with the BL contrasts (21 cases), researchers found BL to be superior, with a mean effect size of +0.35 compared to a mean effect size of +0.05 for purely online.

Most recently, in 2014, Bernard et al. conducted another meta-analysis, using 117 studies comparing classroom instruction (CI) with blended learning (BL) conditions. The BL condition outperformed the CI condition with an effect size of ($g+ = +0.33$). The study also analyzed interaction patterns of student-instructor (S-I), student-student (S-S), and student-content (S-C) during BL. If two types of interaction were involved, the effect size was ($g+ = +0.44$); if all three types occurred it was ($g+ = +0.47$). Among possible moderating variables tested, the effect size was the largest ($g+ = +0.59$) when the purpose for using technology in BL was for "cognitive support."

This evidence of outcome differences in online, blended, and face-to-face learning warrant study. However, causal factors leading to these outcomes are not understood. Zhao et al. (2005) suggested instructor involvement as a critical factor, and Bernard, Borokhovski, Schmid, Tamim, and Abrami (2014) considered student-instructor interaction as an important treatment effect. The Means et al. (2010, 2013) outcomes similarly credited instructor-directed learning environments with the largest pedagogical effect. However, these studies did not identify specific aspects of instructor involvement/interactions resulting in qualitative differences between a face-to-face or synchronous high-fidelity

environment and asynchronous text-based learning, nor did they suggest whether instructor involvement might be more critical for declarative vs. procedural learning. The Means et al. (2010, 2013) study reported opportunity for face-to-face time with the instructor during instruction to be one of the significant moderating variables for online learning. However, the Sitzmann (2006) study, which attempted to differentiate between learning declarative or procedural knowledge, seemed to imply no significant moderating effect of human interaction on acquiring declarative knowledge. Some authors have argued that improved outcomes may have more to do with learners' increased time on task in the BL environment (Sitzmann et al., 2006; Means et al., 2010).

While the meta-analyses give a broad view of BL impact in experimental studies, many non-experimental studies have also considered BL learning effectiveness. The Research Initiative for Teaching Effectiveness at the University of Central Florida, an early institutional adopter of BL, conducted a multi-year study involving tens of thousands of students examining success rates (C− grade or above) of their online, blended, and face-to-face course offerings. Accounting for college, gender, and modality, they found that while college was the best predictor of success rates, within colleges the success rates for BL were higher than either face-to-face or entirely online courses for both genders (Dziuban et al., 2004). A study looking at success rates of BL offerings at the Rochester Institute of Technology (with a high representation of students with hearing impairment) reported 95% of students completing courses with a grade C− or above (Starenko, Vignare, & Humbert, 2007). Larson and Sung (2009) went beyond academic performance, finding that 52% of BL students had increased interest in the subject matter more than online or face-to-face participants.

As previously mentioned, more research is needed to identify quantity and quality factors of blended designs that impact achievement and success rates. Shea and Bidjerano (2011) used the community of inquiry framework to analyze levels of teaching presence and social presence in blended and fully online learning environments, including relative impact of these constructs on cognitive presence. The BL students reported higher levels of all three components of the teaching presence construct (instructional design, discourse facilitation, and direct instruction) and two of the three social presence components (affective communication and open communication with instructor and other students). Researchers have reasoned that these factors could explain why meta-analyses show students in blended courses outperforming students in purely online courses.

Student Engagement

Researchers have correlated student engagement with many positive outcomes, including academic achievement, satisfaction, and persistence, but no consensus exists for defining and measuring student engagement (Reschly & Christenson, 2012). A prominent model found in the *Handbook of Research on Student Engagement* notes three domains for engagement: behavioral, emotional, and cognitive (Fredricks, Blumenfeld, & Paris, 2004). Additionally, engagement can be studied at various levels, including institutional, school, course, or activity (Skinner & Pitzer, 2012). Online technologies have increased the range of ways engagement can be measured, including analytics to access real-time data beyond the typical end-of-course self-report survey (Henrie, Halverson, & Graham, 2015). One study used learning management system log data and brief activity-level surveys to document variations in learner engagement across a semester, finding that clear instructions and relevant activities were more impactful than modality (Henrie, Bodily, Manwaring, & Graham, 2015).

Though often used to justify blended approaches, improved student engagement is not frequently studied. Analysis found that over half of the most frequently cited 85 articles and chapters mentioned engagement, but only four directly addressed research questions related to this construct (Halverson et al., 2012, 2014). Much of the blended learning engagement research stays at a general level, not specifying pedagogical features that might impact engagement. For example, a 2007 survey (45 institutions, N = 23,706, blended course enrollment = approximately 70%) found a positive correlation

between measures of engagement and students' use of course-related learning technologies (Chen, Lambert, & Guidry, 2010). Vaughan (2010) used the *National Survey of Student Engagement* and description to explore positive impacts on students' active learning in redesigned blended courses required by an institutional initiative. Alternatively, a study by Delialioğlu (2012) compared student engagement between lecture and problem-based approaches in blended courses and found higher levels of engagement with the latter. Halverson's (2016) research looking at engagement in the online and face-to-face portions of blended courses at two institutions found that students experienced engagement differently in the two modalities. However, she was not able to determine how the differences might be connected to pedagogical practices distinct between the modalities. Qualitatively oriented research, including a cross-case analysis of student experiences with BL, documented the varying barriers to engagement faced by students with different backgrounds and needs (Holley & Oliver, 2010).

Student Satisfaction

Research has found that learner satisfaction in BL courses is influenced by students' expectations, goals, and preferences, as well as by the course design and implementation. For example, a learner expecting no instructor interaction might be well satisfied with a moderate interaction level, while a student expecting high interaction might be dissatisfied with the same experience.

Vignare (2007) suggested a need to identify and benchmark the elements leading to satisfaction in BL environments. Dziuban, Moskal, and Hartman (2005) used factor analysis to identify two dimensions of satisfaction—*learning engagement* and *interaction value*—then later identified eight elements contributing to learner satisfaction in online and blended courses (Moskal, Dziuban, & Hartman, 2010). Rothmund (2008) also found a correlation between learner interaction and satisfaction in blended courses. Akyol, Garrison, and Ozden (2009) confirmed that students valued both social presence and teaching presence in their BL experiences.

Because student satisfaction is connected to learner dispositions as well as course design, some researchers have hypothesized that student satisfaction with BL would be moderated by learner characteristics. For example, satisfaction of nontraditional adult learners may be significantly influenced by the convenience, flexibility, and low cost of BL (Moskal et al., 2010). Researchers at the University of Central Florida investigated ways satisfaction might be influenced by generation (e.g., millennials, boomers, genXers) and found significant differences, with millenials being least favorable toward blended environments (Dziuban et al., 2005; Dziuban, Moskal, Brophy-Ellison, & Shea, 2007; Dziuban, Moskal, & Futch, 2007). Another study used Kolb's (1984) Learning Style Inventory to determine whether students with different learning styles had different satisfaction profiles in a blended course (Akkoyunlu & Soylu, 2008), hypothesizing that assimilators (oriented toward information and ideas) would be more satisfied by online components, while divergers (oriented toward people and feelings) would be drawn to the face-to-face components of the blend. Significant differences were found between the two groups on all six measured elements of the blended environment. Assimilators scored the online and face-to-face components as a close first and second place, while divergers distinctly valued the face-to-face environment over the online aspect. Graff (2003) also looked at learning styles in blended courses and found significant differences. Students with "intuitive" learning approaches (judgments based on feelings) experienced less sense of community than other students. Rovai and Jordan (2004) dealt with sense of community in fully online, blended, and traditional face-to-face courses, finding that blended learning experiences built a stronger sense of community among students than either fully online or traditional courses.

Available evidence shows that many learners value both the richness of interactions in a face-to-face environment and the flexibility, convenience, and reduced costs associated with online learning. This combination may be why most research finds high student satisfaction with BL options.

However, researchers must recognize that, as with learning effectiveness, the pedagogical possibilities (e.g., interaction levels, learner choice) enabled by the modality are what lead to satisfaction. Research looking at over a million course evaluations across different course formats showed that "modality does not impact the dimensionality by which students evaluate their course experiences" (Dziuban & Moskal, 2011, p. 236). Rather, what is important across modalities is the instructor's ability to: (a) facilitate learning; (b) communicate ideas; and (c) show respect and concern for students (Moskal, Dziuban, & Hartman, 2013).

Faculty Issues

Teaching faculty experience many challenges from the rapid growth of blended and online learning. While students drive the demand for blended learning, faculty have probably the most important influence in a blended course or program's success. Many important faculty issues need research, but this section will briefly focus on three: (a) faculty adoption; (b) faculty satisfaction and workload; and (c) professional development.

Faculty Adoption of BL

Faculty at both university and K-12 levels are being asked to teach in blended and online modalities. Brown's (2016) review of literature identified six factors influencing faculty adoption. External influencers were: (a) technology interactions (b) academic workload; (c) institutional environment; and (d) teacher-student interactions. Internal influencers were: (a) instructor attitudes and beliefs; and (b) instructor learning. Ocak (2011) interviewed 117 faculty across four higher education institutions and found the most significant barriers to faculty adopting blended practices involved: (a) instructional processes (complex instruction, time demands, inadequate planning/organization, and ineffective communication); (b) community concerns (lack of institutional support and role stability); and (c) technical issues (difficulty with new technologies and limited Internet access). Technical literacy—including Internet self-efficacy and structural technology access—issues at the institution are prominent factors in faculty adoption of tools that enable blended teaching (Buchanan, Sainter, & Saunders, 2013).

Finally, Porter and Graham (2016) compared faculty self-assessment of their adoption categories (Rogers, 1983) with actual adoption behaviors and found that their self-perception tended to be at higher levels than their conduct and activity. Using indicators from the *Blended Learning Institutional Adoption Framework* (Graham et al., 2013), Porter probed faculty about how specific institutional practices would influence their adoption decisions; results showed faculty in different adoption categories valued different types of institutional strategy, structure, and support. In a follow-up qualitative study, Porter et al. (2016) sought to understand how to address needs of faculty in the early and late majority adoption categories in order to increase their adoption of blended practices at the institution level.

Satisfaction and Workload

The University of Central Florida found that 88% of instructors were satisfied with teaching blended courses and that 81% were "definitely" willing and 13% "probably" willing to teach another blended course (Dziuban et al., 2004). This compares to the 87% faculty satisfaction with teaching purely online courses, with only 67% "definitely" willing to teach purely online again (Dziuban et al., 2004). All faculty involved in a BL pilot program at the University of Wisconsin were happy with their first blended teaching experience and were willing to recommend the approach to others (Aycock, Garnham, & Kaleta, 2002). However, in contrast a BL pilot project at the Rochester

Institute of Technology found only 41% were willing to teach a blended course again (Vignare & Starenko, 2005).

Faculty satisfaction with online course redesign was influenced by factors associated with: (a) student experience (satisfaction, interaction levels, performance, etc.); (b) instruction opportunities (recognition, reliable technology, collaboration opportunities, professional development, etc.); and (c) institutional support (workload, compensation, promotion and tenure issues, etc.) (Bolliger & Wasilik, 2009). Student factors were of first concern; faculty are not likely to be satisfied if their students' experience is not positive (Moskal et al., 2010). Using student ratings of faculty competence as an indirect measure of faculty satisfaction in blended and online contexts, Larson and Sung (2009) reported student ratings of exceptional faculty competence for purely online (76%), blended (44%), and face-to-face (76%) learning. Relationships with their students motivate and renew many teachers. Forms of online learning with minimal teacher-student interaction, particularly if the instructor feels reduced to assignment grader, can be unsatisfying for faculty (Hawkins, Barbour, & Graham, 2011, 2012). BL can add faculty satisfaction, (particularly for those accustomed to traditional teaching) by enabling some face-to-face relationships with students.

As with online learning, researchers recognize that BL faculty workloads may increase, especially for novice teachers (Colwell, 2006), with time required to: (a) learn new technologies and teaching strategies; (b) create and maintain online materials; and (c) communicate with students by email and other ICT channels. Some recent work has been done for accurately measuring BL workload (Kennedy, Laurillard, Horan, & Charlton, 2015; Ryan, Tynan, & Lamont-Mills, 2015; Tynan, Ryan, & Lamont-Mills, 2015).

Professional Development

Professional development preparing faculty for blended teaching is necessary, as the majority have limited experience in online or blended teaching, and need guidance in redesign and implementation. Examples of effective programs supporting prospective BL faculty can be found at various institutions (Moskal et al., 2013). Garrison and Vaughan (2008) at the University of Calgary have been proponents of the community of inquiry as a framework for professional development in blended teaching. The University of Central Florida has followed up its excellent IDL6543 professional development course (Dziuban et al., 2011) with the openly available BlendKit online faculty development course (Moskal, Thompson, & Futch, 2015). The University of Wisconsin-Madison (Garnham & Kaleta, 2002; Aycock et al., 2002) and Rochester Institute of Technology (Vignare & Starenko, 2005; Starenko et al., 2007) also have exemplary offerings.

Ginsberg and Ciabocchi (2015) studied professional development for blended teaching at 116 institutions of higher education and reported on structural elements including: (a) delivery mode; (b) participation incentives; (c) enrollment choice; and (4) participant outcomes (e.g., readiness to teach BL). Additionally, the study explored which elements of the professional development programs have been most/least successful and why. The study found that face-to-face (72%) was the most common delivery format provided, followed by asynchronous online instruction (55%), blended instruction (45%), and finally synchronous online instruction (30%). Top areas for improvement included providing incentives, requiring training, increasing the number of training staff, and increasing institutional support/funding. While there is limited research on professional development practices specifically for K-12 teachers preparing to teach in blended contexts, there has been some research on professional development for K-12 online teaching, which often includes blended contexts (Rice & Dawley, 2009; Dawley, Rice, & Hinck, 2010).

Professional organizations in higher education and K-12 have created competencies for blended and online teaching on which systematic and sustained faculty professional development might be based (Klein, Spector, Grabowski, & de la Teja, 2004; Powell, Rabbitt, & Kennedy, 2014; Puham &

Graham, 2018). However, little research has attempted to identify blended teaching competencies distinguishable from traditional or online competencies (Pulham, Graham, & Short, 2018). Torrisi-Steele and Drew (2013) make a case for increased focus on pedagogy as opposed to technical skills in the professional development.

Recommendations for Future Research

Although BL is often treated in terms of blending physical attributes of online and face-to-face instruction, its psycho-social relationships are the core of its research and design. Like engineering or architecture, education is a design-oriented field, concerned with tradeoffs involving cost, efficiency, and effectiveness. The foundational challenge of BL research is seeking to find ways of combining the strengths of both humans and machines so both can be maximized by blending them to benefit learners.

Although research shows some general patterns across the modalities of face-to-face, online-only, and blended learning, the root causes for improved learning outcomes in BL contexts are not yet apparent. They will likely be grounded in the pedagogical practices enabled by blended learning, requiring research to examine more closely what happens at the activity level in different blends. Several studies report student and faculty satisfaction with BL; however, satisfaction data must be more closely linked with specific BL design features, discovering *how* BL designs impact both performance and satisfaction outcomes and learners' dispositions toward the subject matter, promoting learner persistence beyond a specific course.

Additionally, significant institutional issues should be explored. Issues affecting faculty satisfaction (e.g., workload and professional development) are underrepresented in the research. Other areas recommended for research include: (a) impacts of interaction quantity and quality on outcomes; (b) relationships between face-to-face and online presence in building BL community and student engagement; and (c) correlation between time on task and BL outcomes. Garrison and Vaughan (2008) identified establishing and maintaining cognitive presence in blended communities as the top BL research need related to the CoI framework. Other researchers have suggested relationships between learner characteristics and success with different blends (Dziuban et al., 2007), particularly relevant as adolescent learners—who lack adult learning characteristics like high self-regulation—encounter BL.

Increasing use of blended learning in higher education, corporate training, and K-12 learning contexts requires more theoretically grounded research to guide practice. Scholarly knowledge is founded on theoretical development, including frameworks appropriate to the three important activities of knowledge creation (Gibbons & Bunderson, 2005). *Exploring* identifies, describes, and categorizes—documenting the wide range of blended learning models and developing taxonomies to enable meaningful systemization facilitating analysis of physical and pedagogical characteristics of the blends. *Explaining*, via theoretical frameworks, the *how* and *why* of BL outcomes possibly extends prominent distance learning theories to the BL context and develops new theories specifically created for understanding BL issues. *Designing* to create the bases for instructional theories will aid practitioners in tailoring BL to their specific needs.

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14

THE ETHICAL CHARACTER OF DISTANCE EDUCATION

Relationship and Responsibility

Melody M. Thompson

In the 2013 edition of the *Handbook of Distance Education*, Thompson and Wrigglesworth reviewed literature on the ethical dimensions of distance education, with a particular focus on students and instructors. On the basis of this review, they concluded that an *explicit* and *rigorous* focus on the ethics of distance education, though gradually increasing, was still lamentably rare, leaving gaps in knowledge and insight necessary for effective and responsible practice.

This chapter extends that review to recent studies and reports. The primary focus is on students and teachers as actors and decision makers; interwoven throughout the chapter is a recognition of how two contextual factors—institutional priorities and an increasingly global, cross-cultural teaching-learning context—strongly influence ethical decision making by both groups. The rise of massive open online courses (MOOCs) during the intervening years, an additional factor complicating the ethical context of distance education, is considered briefly; a more comprehensive approach would need its own chapter. Underlying the entire review and discussion is my own belief that distance education is fundamentally a relationship, and that the primary ethical issues characterizing it are ones of responsibility and care.

The Heart of the Matter

In reviewing literature and writing this chapter, two phrases—actually haunting questions—kept recurring to me: "What Do We Owe Each Other?" (Wendland, 2016) and "What Are People For?" (Berry, 1990). Although the works with these titles aren't focused on distance education, the questions themselves are highly relevant. How teachers, students, and the larger entities that are educational institutions engage in practices that directly or indirectly reflect these questions is at the root—perhaps "heart" would be more appropriate—of ethical questions and issues in educational relationships. Certainly other actors beyond these three influence the practice of and relationships that characterize distance education, but in this chapter I will focus on some of the relationships, responsibilities, and behaviors of these groups as discussed in the literature. From many potential aspects of distance education, I've addressed those that have received the most explicit attention in the literature as fundamentally ethical issues.

Rolfe (2015a) suggests that with "technology-driven changes within the education landscape alongside the growth in global learning opportunities a scenario emerges where the speed of advancements has out-stripped the ethical constructs supporting it" ("Abstract/Description"). Scholars' *explicit* focus on ethics contributes something important beyond personal opinions of right

or wrong: a reasoned argument or discussion, with conclusions grounded in clearly articulated values and goals. What values are privileged? Which are marginalized? What is the impact of context (learning "place," learner characteristics, organizational structure and expectations, etc.) in addition to practitioner values in making our practice ethical? What tradeoffs are required, and what are the consequences of such tradeoffs for students, faculty, and institutions? Because "real ethical implications are scattered along an ethical context continuum" (Olcott, Farran, Echenique, & Martinez, 2015, p. 62), clear articulation of these and other considerations is necessary for discussions of ethical situations to be useful to distance education scholars and practitioners in choosing their own courses of action and to the field in answering questions of ethics and responsibility: what we owe each other, and what participants and practices are for.

Although their relationship and interconnectedness are certainly recognized, the sections on students and faculty are presented separately: "What matters takes place *inside* subjects . . . students, teachers, systems, or institutions. Naturally, thinking this way one may approach the *relationships* between these subjects but *after* it has considered the subjects themselves" (Choplin, 2012, p. 23). The chapter ends with an evaluation of the extent to which current literature on this topic meets the criteria outlined above.

Responsibilities of Students

The literature on students' ethical responsibilities overwhelmingly focuses on two categories: academic honesty and commitment to learning. Interestingly, the first is most often presented in negative terms: as a problem of *dis*-honesty that the other two groups—teachers and institutions—need to solve. The second is generally presented as a shared concern in which student, teacher, and institution are co-actors in a relationship characterized by mutual ethical agency and responsibility (Thompson & Wrigglesworth, 2013).

Academic Integrity

Students' academic dishonesty—cheating, plagiarism, etc.—has been a standard focus in the distance education literature for many years. Thompson and Wrigglesworth (2013) reviewed studies and reports between 2000 and 2009 that discussed the extent of academic dishonesty among distance students, comparisons to traditional education, motivations and structural causes, and approaches for limiting the behavior. Not surprisingly, given growing numbers of online distance education programs, more recent literature continues to reflect these areas of concern.

Although the earlier review noted that a few dissenting voices questioned the widely held idea that academic dishonesty is more prevalent online, most scholars supported this taken-for-granted assumption, even when noting its largely anecdotal foundations. More recent literature (e.g., Hrubý, 2012; Coleman, 2011 Sayadmansour & Nassaji, 2013; Berkey & Halfond, 2015) continues to promote the belief that "of the problems confronting contemporary universities, academic dishonesty may be one of the most serious especially since the online environment provides a more tempting environment for students to cheat" (Bušíková & Melicheríková, 2013, p. 1). Scholars' beliefs about the importance of the problem are reflected in characterizations of the potential outcomes of students' ethical lapses: "degradation of the whole educational system" (Hrubý, 2012); a "serious threat to program integrity" (Berkey & Halfond, 2015, p. 1); and "serious consequences for [students'] reputations in the future" (Marshall, 2014, p. 254), among others.

Scholars note that factors motivating traditional students—pressure to achieve, lack of sufficient preparation, and a perception that "everyone does it"—carry over into distance education environments. As use of technology, particularly the Internet, has become a ubiquitous feature of daily social, academic, and professional life for most people, familiarity with technology and ease of "pirating"

have become the leading factors in discussions of why and how students engage in academic dishonesty in distance education courses (Coleman, 2011, Strader, 2014).

Characteristics of the distance education context are additional factors. Some scholars suggest the physical distance between instructor and students—which precludes close oversight—and the psychological distance between participants—which may contribute to a weaker sense of community and mutual responsibility—as factors in distance students' academic dishonesty (Rowe, 2004; Berkey & Halfond, 2015). Sharma and Maleyeff (2003) write of "moral distancing," by which a seemingly "victimless" act easily and anonymously committed via technology "leads to a distance between the self and the action" (p. 22). These characteristics are exacerbated in MOOCs, which may enroll many thousands of students who receive little or no direct oversight, modeling, or support from the faculty teaching them. Because students don't pay tuition for MOOCs and because a common practice is peer rather than faculty assessment, "cheating in a free MOOC may seem inconsequential to a student" (Marshall, 2014, p. 254).

Culture also plays a role, since ideas about what constitutes academic dishonesty and motivations to succeed differ across cultures (Nagy, 2009; Grijalva, Nowell, & Kerkvliet, 2006). Cultural differences in writing habits and style can make it difficult for some students (a group that may include both other-culture and dominant culture students) to understand that they are cheating (Gullifer & Tyson, 2014). Accepting this latter point has led some institutions to adopt a "decidedly educative" approach to the problem via online academic integrity (AI) resources that stresses education rather than "punishing after-the-fact" (Griffith, 2013, p. 2) or by explicitly embedding ethical standards for students and teachers in the distance education environment and process (Al Hamad & Al Qawasmi, 2014). Other, more teacher-specific approaches are discussed ahead in the section on teacher responsibilities.

Student Commitment to Learning

Haughey (2007) presents a strong argument for students' responsibility not only for their own learning, but also for contributions to others' learning: "in joining a learning community [students] must realize that they assume responsibility for being fully committed as genuine learners to their own and their colleagues' welfare" (p. 142). His focus on character—what people should *be*—connects directly to the question of what people owe each other: mutual responsibility and accountability among students depends on instructor and institution modeling and supporting core values such as honesty and integrity. Other literature echoes the idea of student engagement as an explicitly ethical responsibility, but Haughey takes the argument further in suggesting that students have an ethical obligation not only to each other, but also to the instructor. Providing the instructor with thoughtful feedback about the teaching and the course contributes to the instructor's own learning and personal-professional fulfillment.

Kawachi (2009) develops the theme of interdependence, arguing against "individualist autonomy as a goal in education" (p. 25) and focusing on positive ethical behaviors in student-student, student-content, student-instructor, and student-technology interactions. A similar focus on shared responsibility is apparent in Luppicini's (2009) analysis of "conversation ethics" in which he combines insights from technoethics and language theories as the basis for guiding questions for participants to use in co-constructing meaning in distance education courses.

> As is true with the issue of academic dishonesty, cultural differences in beliefs about responsibility for learning, in communication patterns, and in power dynamics between dominant and marginalized groups, can limit the generalizability of models or guidelines that prescribe student responsibilities for their own and others' learning.
>
> *(Thompson & Wrigglesworth, 2013, p. 404)*

Online instructors in traditional Western learning environments commonly expect non-Western students who remain physically in their country to "step out of their own culture and temporarily enter into the culture of the instructor" (Moore, 2006, p. 1), which usually is also the culture of most other students in the course. From one ethical perspective, such a situation represents a "digital flow of power and domination" (Rye & Støkken, 2012, p. 193) through which some students' life experiences, "voices," and approaches to learning are marginalized and their academic success limited by rewarding only those behaviors valued in Western academic settings (Zhang, 2007; Uzuner, 2009; Shattuck et al., 2014). From another perspective, differences in cultural expectations may benefit the non-Western students by expanding their perspectives and repertoire of learning skills. An often-missed consideration is the potential benefit to the *dominant*-culture students when courses offered internationally are designed to encourage a mix of approaches and goals. Not only are they introduced to additional experiences and patterns of thinking and action, but they are encouraged to examine the extent to which their own attitudes and behaviors are cultural artifacts, "to situate themselves in relation to others, to perceive similarities and differences in personal opinions and reactions within the group, and start identifying the complex factors influencing their attitudes" (Gunawardena, 2013, p. 196).

As Olcott, Farran, Echenique, and Martinez (2015) argue, "Education is based on values, and education is provided in, with and from values" (p. 67). Accepting this premise dictates that scholars who write about the ethics of distance education clearly articulate the values and assumptions on which are based judgements of ethical or unethical, responsible or irresponsible.

Responsibilities of Teachers

In designing and teaching distance education courses, faculty members make decisions about objectives, technology, course materials, instruction, and assessment, among other things. Few of these decisions are neutral in their impact on participants, and the differential impact that results from one decision vs. another has distinct ethical dimensions. In addition to these commonly discussed activities, some scholars have suggested an additional faculty responsibility: continued learning to develop both their cultural intelligence (Thompson & Wang, 2014; Sadykova & Dautermann, 2009) and their own ethical awareness as educators (Burge, 2009; Thompson & Kearns, 2011; Hrubý, 2012).

Establishing Goals and Objectives

Thompson and Wrigglesworth (2013) reviewed a range of articles on the ethical dimensions of what has been termed the "commodification" of higher education: "the apparent shift from learning as a way to become more fully human to learning with the goal of becoming a skilled worker able to contribute to a strong economy" (p. 407). This literature reflects ongoing concern with a perceived narrowing of higher education goals in general, and in online programs in particular (e.g., Beaudoin, 2013), leading to an emphasis on goals favored in a globalized economy at the expense of "liberation, democracy, diversity, and community" (Carr-Chellman, 2005, p. 157). The questions "What are people for?" and "What is distance education for?" are very much at the heart of educators' decisions on goals and objectives.

Russell (2009) and Tait (2009) argue for the importance of courses that address affective dimensions related to social and/or cultural contexts; both contend that program decision makers are ethically responsible for providing courses with goals beyond the vocational or economic. Addressing this responsibility is complicated by the common tension between teachers' personal-professional values and organizational goals and needs. Tait concludes that distance education's legacy of flexibility and commitment to innovation offers the *potential* for effectively engaging with social goals when "purposes framed within ethical understandings are not suborned" (p. xvi) by competing

organizational priorities driven by external forces. Olcott et al. (2015) note both the difficulty in and importance of resolving such tensions. Believing that education must contribute to the development of critical thinking, judgement, and citizenship, they also note that "the context [for ethically sound opportunities] is expanding at the same time that a series of emerging factors are generating potential ethical problems among educators" (p. 63).

Deciding whose input should be considered in setting goals is fundamentally an ethical question. Most distance higher education students are adults, and a core principle in the adult education literature is the ability of adult students to identify what they want and need to learn. However, this norm of practice is not universal, and the inherent tension among competing viewpoints suggests a number of potential ethical issues based in differing ideas about the goals of education and the responsibilities and rights of participants (Thompson & Kuhne, 2014). Finding a balance among institutional priorities, faculty expertise, what students say they want—perhaps because of social and/or economic pressure—and what they might choose—were they aware of the benefits of broader options—presents an ongoing challenge for those developing online courses and programs. Sork (2010) grounds his support for participatory planning in the belief that democratic principles and the autonomous nature of adults in a free society argue against the external imposition of goals. For Cervero and Wilson (2005), inclusive participation is an ethical principle that reflects a justice-based answer to the question of "whose interests matter enough to be represented at the planning table" (p. 92).

Decisions about goals and objectives have become even more challenging in the context of globalized distance education programs. Several authors note that without teachers' conscious attention to the issue of students' diversity, course objectives may reflect a bias toward dominant cultural values (Anderson & Simpson, 2007; Sadykova & Dautermann, 2009; Thompson & Wang, 2014). Objectives common in courses developed in "Western" countries—such as collaborative learning—often reflect a such a bias. "Culturally alien" (Bates, 2001, p. 129) objectives may disadvantage students from non-Western cultures; alternatively, students might find such differences ultimately attractive, again illustrating how a practice with inarguably ethical dimensions may be viewed as either ethical or unethical depending on the value principles on which it is based and articulated.

Course Design

Questions of objectives are closely tied to issues of course design, including selection of technologies and materials. Thompson and Kearns (2011) ask how educational opportunities are limited or enhanced for certain populations of learners by specific technology and content decisions. The sometimes-conflicting answers suggested in the literature reflect the ethical dimensions of course design.

Technology Choice and Use

Classic course design principles specify that technology choice should be determined primarily by learning objectives, mediated by additional factors central to the teaching-learning context. However, decisions are often influenced by other factors such as cost, availability, convenience, instructor willingness (or unwillingness), and institutional mandates.

The learning management system (LMS) or course management system (CMS) is the most obvious technology component. In most cases, that decision is made at the institutional level. Major ethical questions at this level relate to the basis on which system is chosen (including relationships with corporate vendors), as well as how it is used at the institutional level. One use with obvious ethical implications relates to learning analytics: data collection and analysis with the goal of better understanding student learning needs. Ethical questions relate to "issues of the location and interpretation

of data; informed consent, privacy and the de-identification of data; and the classification and management of data" (Slade & Prinsloo, 2013, p. 1509).

When considering choices often made by the teacher, Kearsley's (2013, p. 431) comprehensive listing of the many technology components that may be built into online courses is helpful:

> tools for creating Websites, making podcasts, preparing multimedia, or conducting Webinars . . . specialized software such as a mathematical equation editor or a music composition program . . . social networking sites . . . basic applications software . . . Web and network access tools . . . support and use of mobile devices.
>
> *(p. 431)*

Ethical factors related to technology choice focus on the effect of different choices on student outcomes, the impact on access for different groups of students, and the extent to which relationships are supported or hampered.

Integration of course design elements should be done in the service of student learning and success. However, some scholars question both teachers' reasons for choosing technologies and the extent of evidence supporting their benefits. While recognizing the potential benefits of educational technologies, Sayadmansour and Nassaji (2013) argue that "quality assurance and 'best practices' in educational media tend to be globally defined . . . and justifications for them tend to be undisciplined" (p. 12). They contend that educators who choose specific technologies for online courses have an ethical responsibility to ensure their educational effectiveness, as well to be aware of—and communicate to students—potential harmful, personal consequences for students, particularly in the case of social networking technologies.

Technology choices influence the ability of some groups to engage in online coursework, or to do so effectively. Sadykova and Dautermann (2009) cite studies showing the different ways in which technology decisions can exclude potential students from particular national, ethnic, or economic groups, as well as how "mismatches in technology access and skills among students coming from different countries/cultures" (p. 95) can create frustration for participants in programs offered transnationally. Other challenges and complexities include required software common in developed countries that may not be available to distant students in less developed countries and the ways in which students from different cultural backgrounds respond to Web content or design.

Who should decide on appropriate technology features, particularly if stakeholders disagree? One study (Toprak, Ozkanal, Kaya, & Aydin, 2010) of beliefs about the ethical aspects of online learning environments found significant differences between students' and instructors' ideas on technology choices. While 67.6% of students at Anadolu University in Turkey believed that only "essential" technical elements should be built into courses because of students' bandwidth challenges, only 39.1% of instructors agreed, citing the educational advantages of multimedia elements. The authors suggest the benefits of research and student surveys on technology issues and challenges as the basis for more effective course design.

Similar concerns are reflected in Russell's (2005) belief that educators have responsibilities connected to students' affective or emotional states. Fulfilling these responsibilities involves "a moral imperative" (p. 1) to consider how decisions about of technology constrain or facilitate an online teacher's interactions with students. His concern that a "distancing effect" makes respect and empathy more difficult to achieve in distance context compared to face-to-face courses is heightened by the belief that the issue receives little attention because of a primary emphasis on measurable learning outcomes at the expense of "the local and long-term effects of mutual respect, compassion, and empathy" among participants (p. 4). The suggestions he offers are intended to reflect an ethic of care and responsibility. However, the emphasis on high bandwidth, blended, and synchronous approaches, while addressing the distancing effect for some students, would of course limit access for

some student populations, as discussed by other scholars already reviewed, once again illustrating the complexity of ethical decision making.

Designing for Diversity

Decisions about course materials have similar potential to limit access. While some educators use materials that are free and readily available to anyone with Internet access, others may use materials that are costly, thereby excluding some potential students. Some materials are unsuited to specific learning styles or cultural experiences, or are inaccessible to those in areas without broadband access. These limitations may represent an ethical issue, depending on the mission of the provider, the way in which courses are marketed, and other factors.

In courses offered globally, even seemingly minor content elements such as examples or phrases unfamiliar to those outside the dominant group can be culturally exclusive (Shattuck et al., 2014). Hai-Jew (2009, p. 155) suggests that as institutions have broadened their reach to enroll a globalized student population, teachers need to develop an educational ethic that consciously considers the "national, ethnic and racial backgrounds of their learners to offer customized value-added higher education." This outcome necessitates course design based on "cultural sensitivity"—identifying and addressing cultural differences and similarities—and "localization"—considering and making use of the multiple "locales" in which students live (p. 156).

Sadykova and Dautermann (2009), focusing on the needs of students in IODHE (international online distance higher education) programs, contend that course design should "be matched to the particular students in a course not just the stereotypes of pseudo-multiculturalism" (p. 101). However, many instructors lack experience in such design. More common is the situation in which instructors use materials and activities that reflect the (usually Western) culture in which a course was developed, with students from other cultures expected to conform to inflexible expectations (Bates, 2001; Anderson & Simpson, 2007; Uzuner, 2009; Rye & Støkken, 2012). For this reason, Hai-Jew (2009) suggests faculty may need training on "how to better reach and learn from and about their global students" (p. 184).

Faculty willingness to engage in such professional development reflects a further ethical issue. What of instructors who believe that any design changes made to accommodate cultural differences necessarily dilute academic quality? These faculty members may refuse to participate in faculty development activities or to make changes that would increase relevance for international students. Beaudoin (2014), in his extensive review of leadership challenges in transcultural distance education, suggests that, ironically, such an extreme position can end up compromising, rather than protecting, the integrity of a transcultural program.

Willingness is one factor; opportunity is another. A recent focus in the higher education literature relates to institutions' increasing reliance on adjuncts as instructors in both resident and online programs, and the ethical issues related to supporting them, including in their professional development (American Association of University Professors, 2010; Pullias Center for Higher Education, 2012).

Given adjuncts' role in online program quality, institutions have a responsibility to provide them with a variety of professional development and support services (Hill, n.d.; Tipple, 2010; Shelton, 2011; Thompson & Kuhne, 2014). Higher education regional accrediting associations stipulate that *all* faculty—whether full-time or part-time, face-to-face or online—"be provided with and utilize sufficient opportunities, resources, and support for professional growth and innovation" (Middle States Commission on Higher Education, 2015, Standard III, criterion 2d, p. 7).

However, considerable research targeting both instructors and administrators suggests that this responsibility is seldom fulfilled (Pullias Center, 2012; Coalition for the Academic Workforce, 2012; Kezar & Gehrke, 2012). Kezar and Gehrke's (2012) study of administrators' statements about the importance of support for part-time faculty compared to institutional actions in providing it found

wide discrepancies between beliefs about what should be provided and the actual provision of training and other support (Kezar & Gehrke, 2012). Thompson and Kuhne (2014) posit that such a misalignment of values vs. practices represents a "trade-off" of perceived ethical duties and priorities: a lower-priority institutional value or constituency is traded off for one deemed more important. For example, while only 16% of respondents in the Kezar and Gehrke (2012) report agreed or strongly agreed that using part-time faculty improves teaching quality, 81% agreed or strongly agreed that the practice solves institutional budgetary problems. Decisions about faculty support at the institutional level may have serious ethical consequences for both teachers and students. As Sadykova and Dautermann (2009) observe, "in the complex context of cross-cultural online education, an IODHE student can be at much greater risk of failure with an underprepared instructor" (p. 101).

Design that serves students and training for teachers are issues additionally complicated by the multi-faceted aspects of "culture." Latchem and Jung's (2011) comment about Asian culture is even more relevant when looking broadly across and within cultural groups:

> It is difficult to generalize . . . because they are shaped by so many different belief systems, physical geographies, and socio-economic circumstances. Moreover, countries once subject to Western colonialism have hybrid or bi-cultural frameworks, and globalization is accentuating the intercultural process.
>
> *(p. 83)*

The challenge, then, is not to design as if students from many cultures—or even within one culture—are uniformly "other," but rather to design and manage courses "so as to induce the different forms of understanding that lie in the culture represented by each student" (Moore, 2006, p. 4).

Sankey and Hill (2009) report how one university confronted the challenge of designing for an increasingly diverse nontraditional student population by providing "a resource-rich multimodal learning environment, allowing students the opportunity to access their course content in a combination of ways" (p. 131). The authors characterize the approach as a more ethical way of serving a culturally diverse student group. Sadykova and Dautermann (2009) see meeting the challenge of designing and implementing a positive IODHE experience as the responsibility of both instructor and students:

> This work requires imagining and building a safe "third space" where students and instructor alike negotiate a new classroom environment where cultural assumptions about learning and teaching brought to the course can be honed, but where for the duration of the course, a new contingent cultural space is derived from the needs of everyone present.
>
> *(p. 101)*

The Wisdom Communities instructional model (Gunawardena, 2013) has a similar goal, based on the belief that each online learning community can create its own new culture, one that benefits from its members' diversity and gives all participants a voice.

Designing for diversity is not limited to cross-cultural programs. Content accessibility and appropriateness can be a major issue for distance education students with disabilities. Early assessments viewed online programs as a positive way to address challenges of access for disabled students. However, designers and teachers may erroneously assume that the online format *overcomes* access difficulties. While some authors argue that incorporating universal design (UD) principles is the answer to participation by students with disabilities, others question whether UD is truly the "ultimate solution," noting that it only reduces, but does not eliminate, the need for further accommodations (Seale, 2014; Frey & Kearns, 2014). To date, the literature on the accessibility issue has been limited, particularly in terms of whose "voices" are heard: primarily those of accessibility researchers and

advocates (Seale, 2014). Seale notes that if responsibility for meeting the needs of students with disabilities is distributed among all stakeholders of a university's distance education program—students, teachers, learning technologists, senior managers, student support personnel, and staff developers—then hearing and understanding the perspectives of those stakeholders is crucial to ethical practice.

Crichton and Kinash (2013), in a comprehensive review of literature on access for disabled students, identify several ethical dimensions to course design. They note two relatively recent but welcome changes in the way the literature addresses the topic: not viewing disabled students as a uniform "bloc" and recognizing that accessibility is a human rights issue. Certainly, what we owe each other and why we owe it ties directly to beliefs in the dignity of the individual and the right to education for those who have in the past experienced significant access challenges or been denied access completely.

Copyright Considerations

Complex restrictions intended to protect the rights of authors and publishers reflect both ethical and legal issues related to course design. The literature suggests that many faculty members are either not aware of such restrictions, or don't feel bound by them. Often they are unaware of their own institution's policies on copyright compliance (Thompson & Wrigglesworth, 2013). Even when recognizing the legally and ethically questionable aspects of such behaviors, instructors may engage in inappropriate use of materials, pointing to pressures felt at the beginning of a semester to get a course ready to open. (Sweeney, 2006, "Background," para. 2).

Practical, ethical, and legal aspects of copyright are reflected in efforts by some scholars to confront what they view as overly controlled access to information and published works. Beliefs that such control harms both learning and scholarship have been expressed in arguments for "open access" (Chronicle of Higher Education, 2011; Sharpe, 2010) based on the idea that "accessibility . . . is about ensuring the free flow of ideas and . . . being publicly accountable and making the best out of limited resources" (Williams-Jones, Pipon, Smith, & Boulanger, 2014, p. 1).

Advocates argue that open resources can offer faculty flexibility in course design and be a boon to students, significantly lowering their cost for an online course. However, institutions bear a cost when they pay faculty for the extra time needed to assemble open-source materials into a coherent course. Faculty often note that the extra stipends are seldom robust enough to cover the time spent (Gose, 2017). Another criticism of the open access movement focuses on the decidedly unethical growth in "predatory publishing." This "innovation" led then-University of Colorado-Denver Librarian Jeffrey Beall (2013, p. 1) to warn against this profitable but "unscrupulous" business approach that plays on scholars' belief in open-access publishing as uniformly benevolent and well-intentioned.

Assessment of Learning

Assessing learning in any educational context requires skill in developing approaches that effectively measure outcomes as articulated in specific objectives. Differences between distance and face-to-face education may suggest the need for more tailored assessment approaches, particularly when program mission and/or learner population are nontraditional.

Flexible assessments are often considered important means to limit unethical behavior, based on the belief that more traditional forms, such as tests, are more amenable to cheating, especially in a distance education environment. Several scholars specifically identify alternative assessment as an instructor's *ethical* responsibility, characterizing it as a way to discourage or prevent students' *unethical* behavior.

Olt (2002) identifies three ethics-based approaches to minimize students' cheating and plagiarism on assignments: the virtues approach, for developing students who do not want to cheat; the

prevention approach, to reduce pressures and opportunities to cheat; and the police approach, to catch and punish those who do cheat. Haughey (2007) proposes an explicitly ethical and personal approach situated within the virtues perspective noted previously, suggesting that rather than relying on standardized approaches, strict rules, and punishments in response to cheating, educators should view academic dishonesty in terms of relationships and collective responsibility. Thus, instructors should model ethical expectations for students through understanding their students' contexts, establishing fair workloads, and clearly communicating standards for performance and behavior.

The "naïve" assumption (Nagy, 2009, p. 256) that all students enrolling in a distance course or program "have the same foundation skills and are thus able to equally conceptualize and utilize technologies" to complete assignments ethically is likely to be unfounded. Nagy notes that cultural differences penalize students from academic cultures in which a single final examination—for which students can "cram"—rather than graded assignments throughout a course is the common practice. She suggests that teachers desiring to respond ethically to an increasingly diverse student population should consider offering students multiple assessment pathways as part of the "need for diversity in teaching paradigms" (p. 249).

Ethical questions surface in discussions of now-standard approaches to identifying violations of academic integrity in student assessments. For example, several scholars have suggested that use of a service such as Turnitin may create a "culture of mistrust" or that this practice may infringe on (even if not legally violating) students' intellectual property rights through the creation of databases of submitted papers that are used for economic gain by the parent company (Krsak, 2007; Marcattilio-McCracken, 2015).

Addressing instances of suspected academic dishonesty in student assessments is a well-understood instructor responsibility, yet many are reluctant to actively pursue such cases. Reasons for this attitude include time pressures, complex institutional procedures, fear of poor student evaluations, and lack of administrative support for following institutional policy (Trenholm, 2007; Lim & Coulter, 2006; Coleman, 2011). While recognizing the difficulties, Lim (2009) suggests that educators' higher goal argues for ethical modeling: "In order for faculty members to nurture their students to become ethical and responsible citizens of society, they need to pursue all suspected cases of [course] misconduct even in the face of possible hardships" (p. 223).

Relationship With Students

At the beginning of this chapter, I proposed 'relationships' as one critical basis on which to examine the ethical dimensions of distance education. Certainly the relationship between teachers and students is foundational to our practice. What do teachers owe their distant students? As Beaudoin (2014) and Sadykova and Dautermann (2009) point out, for some the answer is limited to transmitting knowledge of their particular discipline, a common view in traditional face-to-face higher education. For others, particularly those scholars focused specifically on the ethical dimensions of distance education, the answer goes beyond sharing knowledge to the responsibility for fostering a more multi-dimensional caring relationship.

Some scholars have addressed the question of whether ethically responsible, caring relationships are possible in distance education environments. Zembylas and Vrasidas (2005) build on the ideas of philosopher Emmanuel Levinas, whose views stressed physical proximity—being face-to-face—as an important condition for fulfilling one's ethical responsibilities to another person. They conclude that caring, ethical relationships are possible at a distance, but must emerge from acts of authentic conversation. Thus, teachers' technology choices need to ensure a highly transparent

> *inter-face* . . . a common significant place where we can see, feel, and respond to the Other. And when we respond to the Other with the help of the inter-face, we affirm the Other's

> right to exist. This sense of responsibility to the Other is a key part of ethically responsive online pedagogies.
>
> *(p. 69)*

In a similar vein, Petrik, Kilybayev, and Shormanbayeva (2014) explore the extent to which meaningful learning is possible via the Internet, particularly in relation to philosopher Hubert Dreyfus' contention that, to a large extent, learning is undermined, rather than supported, in this environment. The authors argue that online education "can support and enhance meaningful interpersonal relationships and, consequently, meaningful learning" (p. 278). At the same time, they recognize value in parts of Dreyfus' critique as an important "counterpoint to the widespread and often unqualified enthusiasm extended to the Web's capacity to dramatically enhance education" (p. 283, footnote).

Haughey (2007, p. 139) proposes that to teach is to lead in the development of responsible relationships based on moral and ethical principles. Ethical teachers have the obvious responsibility to be knowledgeable in their disciplines and skilled in communicating about them, but they also will lead by example in the development of learning communities characterized by responsibility, authenticity, and presence: "Responsibility reflects the ethic of caring through relationality. Authenticity is based on reciprocity. Presence involves putting the other at the centre while being open oneself to personal change" (p. 141).

In a discussion of the ethical implication of MOOCS, Marshall (2014) refers to the American Association of University Professors' (AAUP) "Statement on Professional Ethics." He emphasizes the statement's point that scholars and teachers have an ethical obligation of care for their students and identifies the potential for compromising this responsibility in designing, marketing, and studying MOOCs. His discussion of the teaching aspect of MOOCs is less than helpful, however. Although he briefly refers to the importance of teachers as role models for their students and as potential guides in helping students make important life choices, he fails to engage with the fact that many academics who teach MOOCs have no direct contact with their students, avoiding the question of how likely it is that they will meet the criterion of being "responsive to the needs of all their students" (p. 254).

On the basis of her systematic review of the literature on smaller, more targeted "connectivist" or cMOOCs and expansively targeted xMOOCS, Rolfe (2015b) concludes that MOOCs have "challenged the relationships at the very heart of education" (p. 54). The particular challenge relevant to this chapter's topic is one she reports as missing from the literature on the social and ethical aspects MOOCs: "what constitutes ethical online learner and teacher behavior" (p. 66).

Commitment to Continued Learning

Thompson and Wang (2014) suggest that only through a commitment to continued learning can distance educators fulfill their ethical responsibility for creating and maintaining an environment in which all participants are able to both learn and develop as human beings. Two particular areas of learning are cultural intelligence and ethical reflection.

Cultural Intelligence and Responsiveness

As cross-border distance education programs have increased in number, scholars have argued for the importance of understanding and meeting the needs of students from different cultures. Yet many educators, regardless of best intentions, are unprepared to address what Rye and Støkken (2012, p. 194) refer to as the "thrown*together*ness" of online courses offered globally. General principles of inclusion and "sensitivity," while important, need to be concretized in the development of specific knowledge and skills gained either through formal faculty development activities or self-study.

The need for good intentions to be given concrete form is illustrated by Heitner and Jennings' (2016) study in which they created and tested an instrument to measure faculty members' belief in the value of culturally responsive teaching, knowledge about culturally responsive teaching, and self-reported extent of culturally responsive teaching practices. Results indicated that while faculty strongly supported the value of such practices, their level of actual knowledge and implementation of them was considerably lower.

Although scholars routinely note and discuss challenges related to online programs delivered to a global audience, few comprehensive models exist to guide educators in becoming more culturally responsive. Sadykova and Dautermann (2009) review several institution-specific professional development programs with an emphasis on cross-cultural issues. Goh (2012) discusses cultural intelligence (CQ), a theory-based, rigorously tested approach to fostering intercultural awareness and competence as a promising approach. Used extensively in business, CQ has been adapted to education. Rather that asking educators to master a set of rules for different cultures, CQ fosters a flexible set of skills: paying close attention, reflection on the meaning of underlying behavior, seeking out relevant information and advice, and adapting in the face of what is learned. CQ helps teachers become aware of and willing to challenge their own cultural assumptions, including those about what constitutes good teaching and learning (Goh, 2012; Ang et al., 2007). Cultural intelligence can be developed and enhanced in a number of ways, including guided learning activities and self-reflective peer mentoring experiences (Maltbia & Power, 2009; Maltbia, 2011; Thompson & Wang, 2014).

Developing a Personal Foundation for Ethical Behavior

The second responsibility for continued learning focuses on development of a conscious and intentional foundation for personal ethical reasoning and behavior. Marshall (2014, p. 252) proposes that, "As scholars and researchers, we are individually and collectively responsible for ensuring that we engage with the ethical implications of our work actively rather than just passively avoiding the issue." Anderson and Simpson (2007) agree, citing the need for a disciplined approach to ethical issues faced by distance educators (p. 129), while Haughey (2007) contends that teachers should be as clear about their own ethical principles as they are about what they teach. Believing that ethical issues characterize even the most seemingly mundane aspects of practice, Thompson and Kearns (2011) argue that ethical reflection should be an integral consideration in distance educators' day-to-day thinking and propose focusing questions to help teachers identify and think through the ethical dimensions of common instructional activities.

Others have noted that very few educators are prepared to meet this challenge (e.g., Burge, 2009. This inability often results from insufficient awareness and/or lack of knowledge. The ethical dimensions of practice can be easy to miss among challenging and often-conflicting factors in their complex organizational contexts (Heaney, 2009). Additionally, many faculty members—particularly in the United States, where graduate education focuses almost exclusively on knowledge specific to a single academic discipline—have had no introduction to moral philosophy, ethics, and ethical decision making as a foundation for conscious ethical practice. Some may even be uncomfortable in considering ethical questions. Because such questions "are closely linked to judgments of moral accountability . . . [w]ords like 'should,' 'ought,' and 'must' enter into the conversation. Thus, it is not surprising that discussions of ethics have the ability to make us nervous, defensive, and annoyingly self-righteous" (Morris, 2008, p. 1).

How do educators gain such a foundation? Haughey (2007) observes that professional development programs intended to encourage reflective practice should emphasize the development and articulation of a personal ethical framework.

Parscal and Benski (2009) describe a course for prospective online instructors in which participants examine and discuss principles for ethical teaching in order to encourage application of

such principles in their practice. Day-to-day active engagement in questions of values and "practical morality," using "energetic self-reflection" to apply *general* ethical principles to *particular* cases can provide a guide for right action (Anderson & Simpson, 2007, p. 129). Wilson (2009) agrees on the importance of reflection as a foundation for examining and addressing the ethical challenges of educational practice. He cautions against a uni-dimensional view of the process, instead encouraging readers to:

> understand reflection as a number of ethical possibilities, from awareness . . . to a critical personal insight . . . to a more trenchant social accounting that has far more explanatory power for assessing the practical and ethical consequences of professional action.
>
> *(p. 79)*

Finding the balance between overarching ethical principles and the particulars of a given context and situation is necessary for educators to develop ethical competency. Sets of general principles or classic ethical theories are valuable resources, but only to the extent that an educator engages in the continued learning necessary for developing a "moral persona": not a universal framework to apply personally, but rather "a coherent and stable *personal* framework that reflects the particular nature of our lives, our values, and our practice contexts" (Thompson & Kearns, 2011, pp. 262–263).

Conclusion: What Is Scholarly Literature for?

The distance education literature continues to reflect progress in the field's ethical awareness and development as scholars and practitioners grapple with difficult challenges in a rapidly changing environment. Especially apparent is an increasing number of international voices, likely a result of both the expanding internationalization of distance education as well as growth in the number and types of publication channels.

As noted in the 2013 edition of this *Handbook*, the depth and sophistication of ethical analysis varies considerably across the literature (Thompson & Wrigglesworth, 2013). Although some authors offer little beyond opinions based on taken-for-granted (but hardly universal) assumptions and norms to support of their categorization of particular behaviors as "ethical" or "unethical," others offer well-developed ethical reflection and justifications tied explicitly to clearly stated values, principles, and goals. Interestingly, the latter, more rigorous analysis comes much more frequently from scholars outside the United States. Exemplary examples include Olcott et al.'s (2015) analysis of global and local distance education ethics, Zembylas and Vrasidas' (2005) discussion of online education ethics in terms of Levinas' philosophy of otherness, and Slade and Prinsloo's (2013) examination of ethical questions related to data analytics.

In this respect, Moore's (2012) observation about Choplin's analysis of French distance education research literature is more broadly appropriate:

> I wonder if this glimpse of the French tradition might inspire any American researchers to look for a more philosophical approach . . . daunting though the prospect is given what little exposure there is to such methods in our universities generally, and colleges of education in particular.
>
> *(p. 1)*

Ethics is, after all, a branch of philosophy. Scholars engaging in even a superficial grappling with and writing about questions of ethics in distance education should use the tools appropriate for such analysis: at minimum, elementary foundational principles of ethics and moral philosophy. Otherwise, insights and conclusions in their writings are unlikely to be useful to readers seeking guidance in the

ethical challenges they face in their own practice. As Moore points out, however, many American graduate education programs are sadly lacking in even basic introductions to philosophical reasoning. While that doesn't excuse scholars—whatever their nationality—from acquiring such knowledge if they intend to write in the area of ethics, it does highlight the challenge involved, as well as suggest *kudos* (in the formal Greek, not American sense) for those who have educated themselves beyond disciplines focused narrowly on education.

One feature of the analysis noted in the 2013 edition of the *Handbook* persists: in most cases, the voice of teacher-researchers predominates as they write about their students, themselves, or teacher-scholar colleagues. In only a few cases (e.g., Seale, 2014; Al Hamad & Al Qawasmi, 2014) do authors include students' perspectives on the ethics of either students' or educators' actions. Ethical actions are negotiated and expressed within relationships. When analysis of the relationship and responsibilities reflects only one "side" of a relationship, the value of the analysis to readers of the literature is truncated, no matter how rich the relationship itself might have been.

The dearth of students' voices in the literature on ethical dimensions of distance education suggests that distance educators more often are thinking *for* students, rather than *with* them (Walker, 2003) about issues of care, responsibility, and ethical action. Surely one ethical consideration is that students' perspectives be considered at first hand, rather than filtered through the lens of researchers, no matter how well trained they are in interpretation. As Seale (2014) states in reflecting on her first book on disability issues:

> The reality is that much of what was included in these chapters was my perspective . . . based on what other accessibility researchers and advocates had written. I feel that I had silenced [other] stakeholders. . . . I need to be accountable for what I left out.
>
> *(pp. 17–18)*

The ability to engage in ethical reflection about day-to-day activities, challenges, and decisions is necessary for building and supporting the fundamental relationships that will make distance education both sustaining and sustainable, that will help each participant answer the questions "what do we owe each other?" and "what are people for in our distance education endeavors?" Although "faculty and students have limited scope to effect [institutional] transformation," both groups can help the field reach its potential (Moore, 2012, p. 2). With the authors reviewed in this chapter, I believe that reaching that potential depends on an "ethics of responsibility . . . [that puts] people and responsibilities in their right places with respect to each other" (Walker, 2007). Scholarly literature that both aids and reflects the hard work of ethical discernment and practice is a cornerstone of this effort.

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15

MOBILE LEARNING AND DISTANCE EDUCATION

Zane L. Berge

While distance education has historical beginnings at least 150 years ago; the personal computer era has greatly increased the number of persons involved in distance education the last several decades. In fact, according to Volungeviciene, Szucs, & Mázár (2016), "distance education is the fastest-growing mode of both formal and informal teaching, training, and learning. It is multi-faceted in nature, encompassing e-learning and mobile learning, as well as immersive learning environments" (p. iii). The term *mobile learning*, or mlearning for short, is a form of distance education that appeared in the early 2000s, with Crompton (2013a) reporting that the term mobile learning became recognized as a subset of distance education during 2005.[1]

When discussing mlearning from a scholarly perspective, one of the first things to do is define the term. Like many contemporary terms that involve ever-changing and improving technology, it is often hard to define or differentiate similar concepts. In some important ways, the term itself is often misleading. Moore & Kearsley (2012), in their book *Distance Education a Systems View of Online Learning (3rd ed.),* clarified the use of the term *distance education* saying*:*

> some people use the term distance learning. If used to describe what happens on the learner's side of interacting with a teacher at a distance, that is fine, but you need to be aware that frequently "distance learning" is used even when the subject is about teaching as well as learning. Because our subject for study is learning and teaching we should use the term education, the term that correctly describes a relationship that has two sides, teacher and learner.
>
> *(Kindle locations 600–603)*

This distinction fits the term *mobile education*, as well. In my experience, the term mobile learning is used more frequently, even when both teaching and learning using mobile devices are being discussed.

In this chapter, I will use the Crompton, Muilenburg, and Berge (Crompton, 2013a) definition: *mobile learning* is "learning across multiple contexts, through social and content interactions, using personal electronic devices" (p. 4). Crompton (2013a) goes on to say a bit more about the four central constructs of the definition—pedagogy, technological devices, context, and social interactions:

> To be clear, the word "context" in this definition encompasses m-learning that is formal, self-directed, and spontaneous learning, as well as learning that is context aware and context

> neutral. In other words, the learning may be directed by others or by oneself, and it can be an unplanned, spontaneous learning experience; learning can happen in an academic setting, or any other non-academic setting; and the physical environment may or may not be involved in the learning experience.
>
> Therefore, m-learning can occur inside or outside the classroom, participating in a formal lesson on a mobile device; it can be self-directed, as a person determines his or her own approach to satisfy a learning goal; or spontaneous learning, as a person can use the device to look up something that has just prompted an interest. The environment may be part of the learning experience (e.g., scanning codes to obtain further information about an exhibit in a museum), or the environment may have a neutral role in the learning experience (e.g., reading articles from the Web while traveling on the bus).
>
> *(p. 4)*

Over the last two decades, digital technology has transformed and empowered learners in modern society to be independent, whether teachers were ready for more learner independence. This gap between learners and teachers often promotes a feeling of dissatisfaction with schooling by learners who often perceive teaching as controlling and a hindrance rather than encouraging technologically enhanced learning. Students and employees want immediate solutions to their problems and quick answers to their questions. Learning needs to be *what* learners want, and often learning needs to be *where* learners are; as opposed to the conventional, just-in-case, dispensation of fixed knowledge, or the "tethered" e-learning that ties people to physical locations.

Theoretical Foundations of Mobile Learning

Certainly, mobile learning shares many of the same theoretical underpinnings as most e-learning, teaching, and learning in general. Observing the broad spectrum of mlearning, one can find aspects of *behaviorism;* mostly characterized by a teacher-centered approach with a primary goal of transferring knowledge, and quick feedback and reinforcement (Skinner, 1971; Watson, 1913, 1930).

Probably more identifiable in the design for mlearning is *constructivism*. Learners can work their way through such active techniques as experiments, immersive gaming, simulations, and real-world problem solving to construct their own knowledge and reflect on it. This can be done collaboratively, also, which may increase motivation and engagement. Thus, overlapping in many ways with the constructivist approach is *social constructivism* (Vygotsky, 1962, 1978) as mobile devices allow users to discuss and share information in a collaborative, learning environment. There are several theoretical approaches that fall under this umbrella. One that draws particular attention when discussing mlearning is *situated learning* (Lave & Wenger, 1991), whereby users can carry their mobile devices into authentic, problem-solving environments or context-sensitive environments as they learn.

Since mlearning tacitly means mobile e-learning (Traxler, 2007); and mlearning is completely nested within e-learning (Figure 15.1), the question becomes if mlearning should have a theory of its own.

Some mlearning scholars argue that it should (e.g., MacCallum & Parsons, 2016). For instance, Crompton (2013b) states:

> Although all forms of e-learning utilize technologies, the attributes of mobile technologies provide a different learning experience to the one *conventional* e-learning technologies can offer. Conventional e-learning is tethered, in that students are anchored to one place while learning. Students typically must designate a time to be situated at desktop computers, with their backs to the world; social and environmental contexts are generally incidental

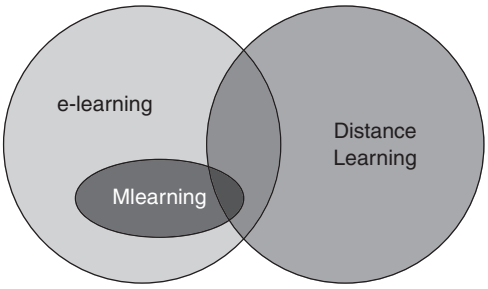


Figure 15.1 Relationships among distance learning, e-learning and m-learning

> to learning. What sets m-learning apart from conventional e-learning is the very lack of those spatial and temporal constraints; learning has portability (Laurillard, 2007; Sharples, 2006), ubiquitous access (Melhuish & Falloon, 2010), and social connectivity (Koole, 2009). *(p. 49)*

Sharples, Taylor, & Vavoula (2007) write that a "theory of mobile learning must take account of the ubiquitous use of personal and shared technology" (p. 224). Sharples et al. (2007) go on to describe the confluence of new learning theory and new technology and place mobile learning in a learning environment that emphasizes *personal, learner-centered*, *situated*, and *collaborative (networked)* learning that is *ubiquitous* and *lifelong*.

Traxler (2007) talks about personalized learning as learning that "recognises diversity, difference, and individuality in the ways that learning is developed, delivered, and supported . . . (and) recognises the context and history of each individual learner and delivers learning to the learner when and where they want it" (p. 7).

Traxler (2007) notes that "Mobile learning is uniquely suited to support context-specific and immediate learning, and this is a major opportunity for distance learning since mobile technologies can situate learners and connect learners" (p. 7). Mlearning is very often situated learning that takes place in normal daily activities and meaningful contexts (Lave & Wenger, 1991). In this way, it is authentic learning—the learner is solving real-world problems and seeking answers that are interesting and relevant to that learner who is engaged in exploration and inquiry (Traxler, 2007), to work with other students on projects and discussions, and to maximize contact and support from tutors.

Several researchers have proposed theories based on conversation (e.g., Sharples, 2002) or collaborative learning (e.g., Roschelle & Pea, 2002), using mobile devices, whereby the teacher becomes a guide or coach and the learners initiate their own learning (Ally, 2004). Of course, these learner-centered, lifelong ubiquitous approaches have implications for the instructional design of mobile learning (e.g., Ally, 2004; Sharples, 2000).

Affordances of Mlearning

In many parts of the world, access to desktop and laptop computers is limited. Mobile devices become one of the few means of delivery of instruction available to learners. In addition to delivery of instruction, mobile devices can be used for communication whenever or wherever the learner is—either in real time, such as a text or a phone call, or asynchronously, such as posting to a discussion forum. These characteristics allow major decreases in time, space, social, and contextual barriers (Waizenegger et al., 2016). The literature is replete with affordances of mlearning (Berth, 2006; Dyson, Litchfield, Lawrence, Raban, & Leijdekkers, 2009; Filali-Marzouki, Khalidi-Idrissi, &

Bennani, 2017; Jamil, Keith, & Shah, 2013; Lohr, 2011; Orr, 2010; Park, 2011; Tangney et al., 2010; Uden, 2007):

- Supports communication, collaboration and knowledge building via real-time and asynchronous data sharing through images, sound and video recordings.
- Supports students' commitment, motivation, and encourage their sense of responsibility.
- Promotes individualized learning, social interactive learning, and student-student and student-teacher interactions.
- Supports independent, constructivist and contextualized learning.
- Often reduces cognitive load because learners are familiar with the features of their own devices rather than being introduced to a new electronic environment.

This list is not exhaustive, but should help the reader to see that mlearning often supports and helps learners solve their problems when and where they are.

Challenges to Mlearning

As with all e-learning, some of the limitations of mlearning are the same as those encountered by distance learners: users often feel isolated, and encounter problems getting adequate technical support. The cost of a mobile device is often mentioned as a major limitation, with popular brands of mobile phones costing as much as a small laptop. While this may be a major barrier to mlearning in some parts of the world, in is becoming less so in developed countries. For instance, 86% of people aged 18–29, and 83% of people ages 30–49, have a smartphone (Anderson, 2015).

Still, there are some issues that are more specific to mlearning (Chergui, Begdouri, & Groux-Lecler, 2017; Doolittle, Lusk, Byrd, & Mariano, 2009; Hashemi, Azizinezhad, Naiafi, & Nesari, 2011):

- Small screens and slow text input on popular devices such as mobile phones and PDAs and many tablets.
- Technological problems such as limited battery life/charges; and connectivity problems; limited storage capacities.
- Limited documentation and training for use of mobile devices in education and training.
- Lack of a common operating system, hardware, and software across platforms.
- Mobile devices go out-of-date quickly.

Again, this list is not all inclusive, but highlights some of the more frequently mentioned barriers to the use of mobile devices.

Conclusions: Looking Toward the Future of Mlearning

Learners will have more choices of devices with larger screens that are easier to read and can have built-in keyboards that will make input easier than with the typical mobile phone. Network data transfer speeds will increase. Network geographic coverage will increase. Devices will continue to add internal capacity and speed. Input, especially verbal input, will become more accurate and faster. Software today allows the highlighting and annotation of text in electronic books, making tablets and other mobile devices almost as functional as books. This functionality will only get better, thus relieving some of the negatives of reading large bodies of text. Your tablet can read it to you, or allow you to carry your library conveniently with you for search and retrieval.

The past 20 years has seen the use of mobile devices begin as a trickle and grow into a torrent as persons in their professional and private lives seek resources, support and learning. A generation is

growing up glued to their smartphones; using them in ways inconceivable only a few years ago. The nature of work is changing and the need to know is *now*. The ability to retrieve and evaluate information just-in-time is more important than front-loading large databanks of information.

There is little doubt that the mobile environment serves as an efficient learning tool. Learners can conveniently access resources and learning materials when and where they want (Waizenegger et al., 2016). When it comes to teaching using a mobile environment, however, I don't think the results are as clear-cut. Anecdotal evidence suggests to me that students enjoy using their mobile devices for individual learning activities that support an in-person classroom, but they prefer not to take a fully digital course through a mobile device.

Earlier in the evolution of mlearning, Traxler (2005) did some work on the words used to characterize mlearning compared to e-learning. I conceptualize mlearning as a subset of e-learning. Traxler was making a point that there is benefit to depicting mlearning as something wholly new and distinct from e-learning. I agree that there are different words and descriptions used to characterize mlearning compared to tethered e-learning (see Figure 15.2).

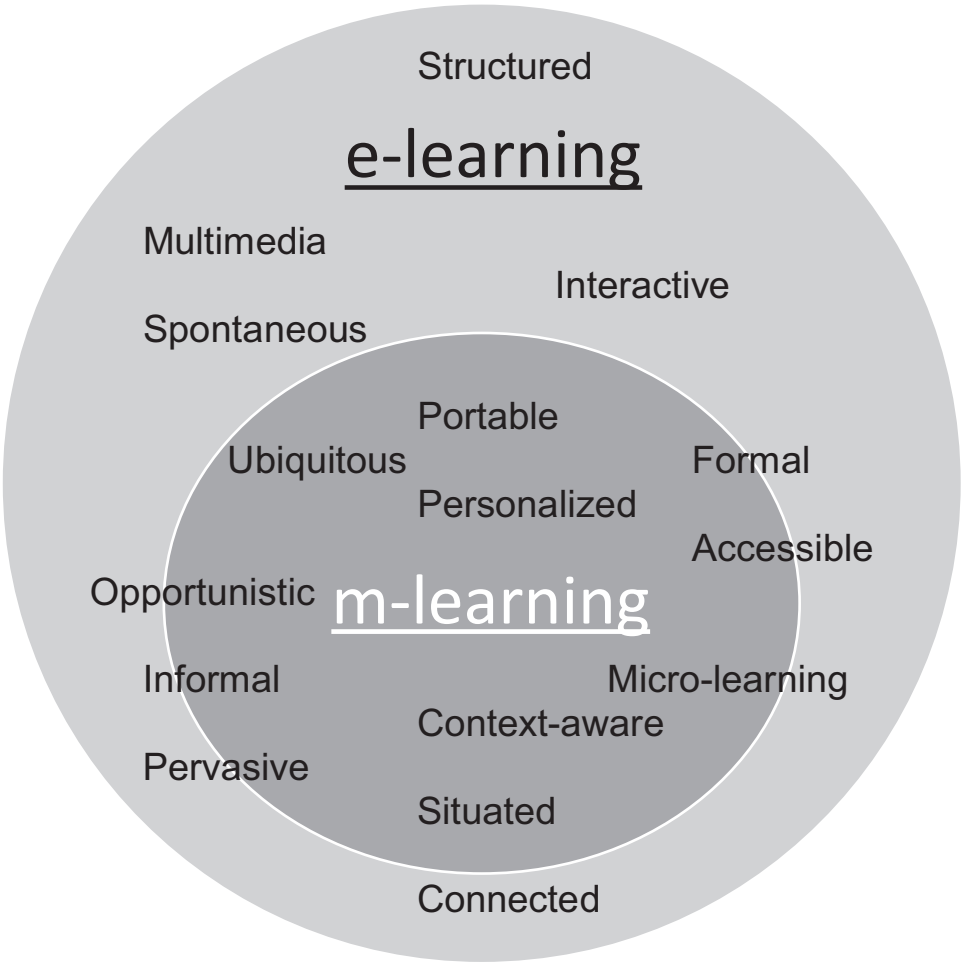


Figure 15.2 Characteristics of e-learning and m-learning

Source: Reconceptualized from Traxler (2005, p. 264)

So, we find a mobile environment that is just enough, just in time, and just for me—for informal learning, and at times for formal instruction. The environment promotes learning where the learner wants it (context-aware), that is spontaneous, personalized, opportunistic, pervasive, ubiquitous, and situated—learning is what the learner needs or wants, when they want it, and only the amount that suits their desire.

Note

1. For a more detailed early history of mobile learning, see Traxler, 2007.

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16

PRESSURES IMPACTING DISTANCE EDUCATION IN HIGHER EDUCATION AND THE USE OF A DESIGN-BASED INSTRUCTIONAL APPROACH

Elizabeth Childs and Susan Crichton

In 2008, the authors (Crichton & Childs, 2008) offered a continuum of pedagogical approaches to illustrate the various ways in which learning takes place in the intersection between students, teachers, and content. The continuum illustrated how traditionally it has been the role of the instructor to determine the place/use of components based on course requirements, learning outcomes, and institutional infrastructure (i.e., width, software platform, instructional support, etc.). In the concluding section of this chapter, the authors share an updated version of the continuum, recognizing the need to add additional columns to include additional and emerging forms of instruction such as, but not limited to, open resources and open pedagogy, virtual worlds and augmented reality, MOOCs, affordances of mobile technologies and wearables, etc. However, it is critical to remember that central to quality pedagogy for distance education is the importance placed on an instructor's understanding of the options, opportunities and unintended consequences of the instructional design of each course and the types of supports, both soft and hard technologies, that enable it. "Distance education is 'structurally different' work (Avolio & Kahai, 2003) and needs employees who are physically or virtually co-located. Moving from traditional education methods to distance education instruction creates new roles and competencies (Yar, Asmuni, & Silong, 2008)" (Ekren, Karatas, & Demiray, 2015, p. 51). Because of its reliance on technology, distance education continues to evolve with the tools of the time. Starting with books and paper-based curriculum mailed to learners in the late 1890s to contemporary users of Khan Academy accessing content using mobile technologies and the Internet, distance education has tended to remain true to its purpose of equity of access and opportunity for learning. The question guiding this chapter is knowing what we know now about distance education and respecting its rich and well-documented past, how might we envision the future of the field?

Designing Instruction or Instructional Design: Considering Changes in Audience, Place, and Purpose

In 2012, Hénard and Roseveare warn in their Organisation for Economic Co-operation and Development (OECD) publication that the higher education sector was increasingly coming under pressure from a variety of sources and needs:

> to ensure that the education they offer meets the expectations of students and the requirements of employers, both today and for the future. Yet higher education institutions are complex organisations where the institution-wide vision and strategy needs to be well-aligned with bottom-up practices and innovations in teaching and learning.
>
> *(p. 3)*

The OECD and others (i.e., *Economist*, *Educause Review*, *Chronicle of Higher Education*, etc.) identify a number of pressures, or what Staley and Trinkle (2011) call fault lines, impacting traditional approaches to teaching and learning within higher education.

Pressure #1—the slowness of institutions to recognize and respond to changing student demographics.

Merisotis suggests, "Students today are older, more experienced in work, and more socio-economically and racially diverse than their peers of decades past" (2015, p. 1). This statement is supported by a report from the Women's Policy Research, cited in Merisotis, which states

> a quarter of those in college today—4.8 million students—are raising dependent children, and more than half of those students are single parents. And . . . only 33 percent of those students with children complete their degrees within six years, compared with the somewhat higher but still abysmally low national average of 54 percent.
>
> *(p. 3)*

Even with that information about changing student demographics, the majority of institutions appear to continue to market and provide instruction in traditional ways and expect students to finance their education as their parents did. This rigid approach to providing and promoting post-secondary education creates challenges for institutions and opportunities for other providers of training and education to impact the previous predictable share of students for established institutions. It makes it difficult to align the workplace and student wants (i.e., a life platform and the ability to solve real-world problems; instructors who curate content and, the opportunity to practice workplace skills such as communication, leadership and teamwork) with what the academy is able to provide (Gallagher & Garrett, 2013).

Many institutions also appear to be ignoring demand for a *different kind* of graduate, continuing focus on specialize knowledge rather than building on a quality, general education that underpins success in a globalized world.

> In survey after survey, corporate executives and the heads of their human resources departments say that they are looking to hire college graduates with well-developed writing, oral communications, and interpersonal skills and with global cultural awareness and understanding, whatever the graduates' majors might be. At the same time, these surveys suggest that employers have identified a deficit of these skills among college graduates.
>
> *(Staley & Trinkle, 2011, p. 6)*

Pressure #2—the questionable value of formal degrees in the workforce in relation to student debt incurred.

This concern is related to an increased awareness that across one's lifetime, a degree or degrees may not lead to increased earning power (Not what it used to be, 2012). However, the same article also acknowledges in the United States, 65% of jobs will require some form of post-secondary education by 2020 (Merisotis, 2015, p. 6). This seemingly binary concern remains unaddressed by post-secondary institutions, suggesting that institutions need to consider ways to align the needs of the workplace with the degree preparation inherent in their programs, recognizing that a "commonplace

assumption since the end of World War II has been that a degree equates to a better job, higher earning potential, and a comfortable middle-class existence. This assumption is being challenged" (Staley & Trinkle, 2011, p. 27).

In response to this pressure, some institutions have changed student assessment and how they represent that assessment to the world. The radical transcript at Elon University provides a "holistic snapshot of a student's undergraduate learning, on and off campus extracurricular activities and leadership experience. All are encapsulated into five domains: internships, research, leadership, service and global education in addition to a student's course work" (Morrison, 2016, para. 1). Grades and credit hours are not the focus. Other examples of this include badging, micro-credentialing, and accreditation of MOOCs.

Pressure #3—the cost to the institution to offer degrees and the increasing cost to recruit quality faculty and revise courses and content to maintain the perceived value of the degrees.

This concern is particularly important, recognizing many institutions are increasingly dependent on sessional instructors and contract faculty while at the same time are competing to maintain their international rankings and institutional status. Coupled with pressure #1, institutions are being called upon to "measure student learning, not classroom time" (Merisotis, 2015). This shift will require a substantial rethinking of evaluation and valuing of students' prior learning and experiences and changes in assessment practices in relation to changes in teaching learning.

Unfortunately, the literature (Merisotis, 2015) suggests institutions continue:

> to assess student readiness for degrees by time spent in the classroom, rather than the learning that's obtained. This outdated model—based on the credit hour—is especially problematic in light of changing student demographics. Increasingly, today's students have on-the-job training, military experience or a patchwork of past studies that can't be counted towards a degree or credential. Shifting to a system that measures competency—what students know and can do—would make prior learning more relevant and accelerate time to completion.

Institutions appear to focus their core hiring on faculty specialists, forgetting the need to respond to employers' commonly expressed need for graduates capable of engaging in "critical thinking, writing, speaking, arguing, researching, and mathematical reasoning" (Staley & Trinkle, 2011, p. 9). The American Association of University Professors (AAUP) notes the majority of instructors are now adjuncts, which suggests general courses are taught by part-time or sessional instructors more in service of credit requirements than in support for developing degree-specific skills and fostering the habits of mind needed to be discerning members of democratic civil societies. This surfaces a frightening trend in contemporary society away from valuing expertise. Quoting recent Brexit campaigners in Britain, "People . . . have had enough of experts" (Mathieson, 2016, p. 1).

Pressure #4—globally, governments are articulating a lack of will and/or an ability to continue to fund post-secondary institutions in the ways they previously have and to continue to offset the rising costs of tuition.

> Campus-based and face-to-face educational practice is increasingly becoming unsustainable, and there are many reasons for this. Foremost among these are the pressures that are at the heart of its funding model and the increasing availability of information and communications technologies that are opening up educational opportunities.
>
> *(Naidu, 2014, p. 269)*

Coupled with binary concern shared in Pressure #2, governments will need to take a role in linking job creation, economic strategies, and a skilled labor force. On the one hand, postsecondary can be criticized for not being aware of changing demographics and workforce demands, government

and business leaders; on the other hand, postsecondary needs to provide strategic direction and agree on the importance of citizens gaining advanced degrees:

> but simultaneously, Americans have less confidence that colleges and universities are preparing students well and providing good value. The countervailing mood suggests that colleges and universities must clearly prove their value and outcomes.
>
> All higher education institutions will start to develop new metrics and new forms of proof of the value added from their degrees. Specifically, colleges and universities will develop assessments and other metrics—such as the widespread use of pre- and post-testing—that measure the specific impact various coursework has had on students' skill levels and intellectual development. Using data-mining tools, institutions will start linking their transcripts to wage data records, drawing connections between success at school and success in the workplace. Colleges and universities will track not only the employment success of their students (e.g., first job) but also the career path of all their graduates (e.g., second and third jobs and promotions received) as a way to demonstrate the value of an institution's degree. Prospective students will compare the career trajectories of graduates of various schools when deciding which institution to attend. College-ranking systems will include these "value-added" scores in addition to other measures.
>
> Part of this reassessment of higher education will center on the value of a degree versus the value of other credentials, such as certificates. In a growing number of fields, a certificate is a perfectly sufficient credential for employment, especially in several "middle-skill" positions. Indeed, students may prefer to collect a succession of certificates over the course of their working lives rather than earn a degree at the start of their working lives. In this sense, higher education will increasingly consist of just-in-time training over a lifetime, a trend that will affect both admissions and alumni relations.
>
> *(Staley & Trinkle, 2011, p. 27–29)*

Pressure #5—increased awareness that there are other ways potential students can gain competence in less formalized ways, leveraging emerging technologies and opportunities.

Institutions are increasingly being called upon to consider ways to democratize instruction while maintaining high standards and relevance. This pressure aligns with the needs of changing student demographics, recognizing that access to the knowledge and skills needs to be more accessible. Opportunities such a "dual-enrollment for high school students, or using technology to make entire programs of study more widely accessible" (Merisotis, 2015, p. 9) must be explored if post-secondary structures are to continue to be viable. Lane, Lemoine, Tinney, and Richardson (2014) posit that to "stay viable in the knowledge economy, post-secondary institutions will need to become business-like entrepreneurs by marketing themselves, building collaborative alliances and preparing for newer, emerging disruptive technologies" (p. 26).

Staley and Trinkle (2011) remind us:

> IT departments are well-positioned to help develop systems and processes to ensure consistent quality and experience for students across a dynamic pool of instructors. Numerous interactive, instructional, and assessment tools can be developed and implemented to enable adjunct-led courses to consistently reach high-level learning outcomes consistently. Much can be done with learning management systems, interactive and intelligent agents, automated workflows, and other emerging tools to enable the effectiveness and success of adjunct instructors. Much can be done to develop and offer strong on-boarding and training programs for adjunct faculty members. And much can be done by incorporating assessment engines, automatic feedback agents, and interpretative heuristics into learning

> management systems and the business intelligence systems that academic leaders are using to review and coach faculty members.
>
> *(p. 12)*

As they note, "Information technology can play a critical role in helping new models of education and instruction reach even higher levels of outcome" (p. 13), but the institutions must change their approaches rather than use new technologies deliver old practices.

Koch (2009) suggests "the higher education market now resembles the American restaurant market," with a wide range of choices: from gourmet five-star restaurants to fast-food franchises to food vendors (cited in Staley & Trinkle, 2011, p. 1). Staley and Trinkle expand on Koch's metaphor, reminding us that for-profit entities are entering the post-secondary space by offering learning opportunities that some intuitions are beginning to credit. They example they provide is:

> The McDonald's management-training program, called Hamburger U, [which] offers college credit to its students in the United States. In Great Britain, Manchester Metropolitan University has accredited Hamburger U's business management program, leading to a de facto associate's degree from McDonald's (with a bachelor's degree to follow). What had been an internal training program for McDonald's restaurant managers is now an accredited program with a degree that these managers can take to other jobs. McDonald's could also conceivably draw in non-McDonald's employees. The training programs of large corporations could present an attractive alternative for many students; indeed, one can imagine a day when students will bypass traditional higher education institutions to go to work directly for companies like McDonald's and avail themselves of the degree-granting training programs provided there. What other for-profit corporations will seek to develop their own degree programs? Will museums, galleries, science centers, symphonies, zoos, and other cultural institutions similarly develop their own colleges and universities, leveraging their own unique talent pools?
>
> *(p. 5)*

Pressure #6—post-secondary education is increasingly globalized, and a global view provides opportunities to think differently about place, time, collegiality, and knowledge sharing.

Wildavsky (2010) notes that "Increasingly, academic mobility can be understood not just literally—as comprising the travels of students, professors, and administrators—but also metaphorically, as a state of mind" (p. 27). He suggests that this is occurring through global movements of students within campuses situated as branch campuses in other countries. The positive outcome of this is a brain circulation rather than the previous brain drains we have seen as gifted students left their homes and contributed to join other nations' knowledge economies. "Knowledge changes the world," he concludes. "And with the right kind of encouragement, the far-reaching intellectual ferment now under way could have a transformational effect similar to that of the twelfth-century Renaissance of learning" (p. 198).

Staley and Trinkle (2011) suggest the impact of new ways of collaborating and competing for a share of international student tuition has significant implications for post-secondary institutions as they become a form of a "new invisible college—global in scope, managed through self-organization and emergent behavior—reflects a knowledge-organization method very different from that of the top-down, hierarchical, command-and-control multiversity that operates much like a corporation."

Citing Anya Kamenetz, in a 2013 TED Talk on the development of a DYI University, she muses whether a new kind of knowledge organization is forming—one whereby:

> Students may seek certificates from a college or university early in their careers, earn a degree or advanced degrees later in their lives, and return periodically for short courses

> and other professional development opportunities throughout their careers. In effect, the student never leaves or matriculates: the student remains a part of the network of professional relationships that the institution represents. This is not just a metaphorical connection; it is an ongoing and active relationship. Students will pay a lifelong tuition fee to belong to this network and will receive what amounts to "service after the sale" after graduation. When they change jobs and require new skill sets, they will look to their alma mater for continued training. They will seek career counseling and indeed will continue to keep a university-affiliated career counselor "on retainer" throughout their careers. When they retire, many of these students will access their alma maters for cultural and intellectual opportunities that may not have been of interest to them or that they may not have had time for when they were younger. As they age, the institution will be a source of "brain exercise" (just as membership in a gym provides physical exercise). All of these services will be factored into the cost of education, which will be extended across a lifetime, not just four to six years. As students find information and knowledge from alternative sources, they will look to their colleges and universities as networks of service and professional relationships.
>
> *(Cited in Staley & Trinkle, 2011, pp. 49–50)*

As those identified issues highlight, in these dynamic times, higher education is increasingly being called upon to modify and adapt in response to the complexity of the issues faced by contemporary society. Critical thinking, risk-taking, complex problem-solving skills, creativity, collaboration, negotiation, and cognitive flexibility are many of the skills that the workplace has identified as being critical in the digital age (World Economic Forum, 2016).

> Academic institutions have traditionally been plagued with the conception of knowledge silos, but it is important to consider that knowledge silos are not only academic endeavors, but also nationalistic and cultural silos that are slowly becoming obsolete. With the global learning communities tearing down the metaphoric walls and developing more humanistic and more fully embracing understandings that humans are equal within this global society.
>
> *(Crawford, 2015, p. 12)*

Central to this paradigm shift are what Miller (2014), Herrington, Reeves, and Oliver (2006) and others have identified as key components of promising practices for the design of learning environments. These include practices that facilitate increasing collaboration and active participation, foster the pursuit of knowledge construction, facilitate discourse grounded in critical thinking, require real-world problem solving, and incorporate processes that involve analysis, synthesis, and evaluation. These are also practices that have traditionally been cornerstone characteristics of a distance education learning environment because of, in large part, its focus on 1:1 interaction and importance of instructors to use the tools of their generation to create relevant and significant learning experiences with their students.

It is clear that distance education has a role to play in addressing these six pressures. Consistent among the six is a recognition that post-secondary institution cannot merely add components and make simple adjustments or tweaks to traditional practice. The required changes will require a shift from the instructional design practices honed with the emergence of motion pictures and instructional video with the purpose of information transfer to the design of instruction that position the student and needs of a changing society at the core and allows for the building of communities of practice that support significant learning and engagement (Helfand, 2013; Kamenetz, 2013; and others).

Using the Tools of Our Time and Their Affordances to Respond to Changes in Audience and Needs

Anya Kamenetz (2010, p. 5) offered this challenge:

> If you were starting a top university today, what would it look like? You would start by gathering the very best minds from around the world, from every discipline. Since we're living in an age of abundant, not scarce, information, you'd curate the lectures carefully, with a focus on the new and original, rather than offer a course on every possible topic. You'd create a sustainable economic model by focusing on technological rather than physical infrastructure, and by getting people of means to pay for a specialized experience. You'd also construct a robust network so people could access resources whenever and from wherever they like, and you'd give them the tools to collaborate beyond the lecture hall. Why not fulfill the university's millennium-old mission by sharing ideas as freely and as widely as possible?

She suggests basically adopting the TED Talk format—bringing together global change makers and thought provokers with students to stimulate conversation, create community, and foster knowledge building. She reminds us of the original components of post-secondary experiences: sharing of content, socialization of novice learners within disciplinary areas, and certification of learners' growing expertise.

The authors of this chapter re-position Anya Kamenetz's question specifically within the Distance Education context and ask:

- What principles would underpin the design of instruction in an institution that provides distance education opportunities?
- What technological affordances would designers consider in to mitigate the six pressures identified earlier in this paper?

Further, they suggest that teaching is a provocation for learning. It is an act that opens rather than limits learning by inviting novices into a field of study and scaffolding expertise through experiences and challenges. This approach returns the university to its Latin roots—*universitas magistrorum et scholarium*, which roughly means community of teachers and scholars (Encyclopedia Britannica, 1911) and tends to problematize traditional instructional design models with their focus on standardization and quality assurance metrics and the outcome of instruction to be observable and scientifically measured (Forest, 2016; Reiser & Dempsey, 2002).

Recognizing the potential of the generations of distance education (Taylor, 2001) to continue to evolve and impact a continuum of pedagogical approaches (Crichton & Childs, 2008), one has to question whether traditional design approaches are still viable.

> The proliferation of distance education has occurred alongside the emerging technologies of the Web 2.0 and Web 3.0 environments, changing the way instructors approach, design, and deliver their instructional materials. In the past, instructional design (ID) practitioners relied on instruction system design (ISD) models that focused primarily on macroinstruction. It is now important for these practitioners to use microinstruction strategies to keep pace with the technology evolution.
>
> *(Moore, 2016. Abstract)*

As Downes (2016) states:

> The last 100 years have seen a significant transformation in the way we understand teaching and learning. We now understand that learning is neither merely the passive reception of

> new information nor that it need not be limited to formal classrooms and educational institutions. Now technologies have enabled the development of open and distributed learning, with access enabled for all, and with materials licensed and shared freely. This, in turn, has led to new ways of looking at pedagogy, as typified by trends in social learning, personal learning, and the massive open online course.
>
> *(Abstract)*

This requirement for viewing pedagogy in distance education anew is echoed by Nafukho, Irgy, and IGI Global (2015) who comment that "developments in technology have an extraordinary potential for transforming education to meet the growing need for customized, self-paced, and on-demand learning" (Preface). However, guidelines and models for how to design effective learning experiences in this emergent, dynamic and co-created space have not been developing at the same pace as the technology supporting these distance education learning environments. Crawford (2015) posits that distance education as a "phenomenon" moves beyond the traditional comfort zones of procedural instructional design, and as such requires designers of the digital learning environments to engage in a "holistic and innovative thoughtful multimedia-supported design and development process . . . must be able to engage more fully in the socio-engagement of the learner within a multimedia-supported global community of learners" (p. 112). Indeed, Stommel and Morris (2013) comment:

> online learning programs fail because they've [course designers] been told, and they believe, they must operate within the same paradigm of learning and teaching that on-ground programs obey. This is a falsehood, a misconception, and at times a deception. More and different types of learning and teaching are available in the digital environment. We must convince ourselves that we don't yet understand digital education so we may open the doors more broadly to innovation and creativity.
>
> *(para. 5)*

Campbell and Schweir (2014) extend this by suggesting that instructional designers need to become learners in contemporary digital learning environments themselves. These observations and critiques mirror those coming from within the field itself wherein traditional instructional design models such as the generic analysis, design, development, implementation, and evaluation (ADDIE) model (Gustafson & Branch, 2002; Clark, 1995; Molenda, Pershing, & Reigeluth, 1996: Rossett, 1987) or Dick, Carey, and Carey (2014) are often criticized by instructional design practitioners, critical theorists, and faculty in higher education as being prescriptive, linear, inflexible, and constraining (de Castell, Bryson, & Jenson, 2002). Rethinking of instructional design in the advent of the World Wide Web, learning management systems, and now mobile technologies and the personalization and globalization of learning, is unlike anything previously experienced by those acting in the role of instructional designers (Crawford, 2015). As a result, "the field of Instructional Design is experiencing continual shifts in and expansions of understanding as regards to instructional design efforts within different instructional environments, with inherent shaking and quaking of previously unquestioned procedures and systematic expectations at the forefront of reality" (Crawford, 2015, p. 114).

As identified earlier, an historic strength of distance education has been its one-to-one interaction and the importance of instructors using the tools of their generation to create relevant and significant learning experiences with their students. While this is still a cornerstone of its success, in the contemporary world of work, life, and play, the role of community, groups and networks has become increasingly part of the fabric and learner expectation for the distance education experience.

Commenting on the trend beginning in higher education to consider distance education via online and blended learning as a viable avenue for education delivery, Sir John Daniel (1999),

while still vice-chancellor of the British Open University, noted savings and efficiencies are not gained through the use of hard technology alone, but rather through the smart deployment of soft technologies:

> Distance learning uses a combination of hard and soft technologies. . . . Hard technologies are bits and bytes, electrons and e-mail, satellites and search engines. Soft technologies are processes, approaches, sets of rules and models of organization. The most important key to using distance learning in a way that is both intellectually powerful and competitively cost-effective is to get the soft technologies right. The hard technologies change.
>
> *(p. 69)*

Dron, Reiners, and Gregory (2011) further define hard and soft hard technologies as follows:

> Soft technologies exist mainly in people's heads. They are the processes that we use to operate knitting needles, use email as a scheduling system, use a wiki to manage a project, apply pedagogies; the way we orchestrate phenomena. Hard technologies take those processes and turn them into hardware and software, embedding that orchestration in a machine. Soft technologies enable creativity and flexibility; hard technologies provide freedom from error, speed and efficiency. Neither is better than the other, it is just important that you have the right balance at the right time.
>
> *(p. 1)*

There are some emerging models for designing contemporary digital learning environments that attempt to extend beyond these process-based, behavioral systems and this cognitivist view of learning instructional design models. Campbell and Schwier (2015) argue that "the need to design for plural cultures is at odds with the need to design for a specific culture with a narrowly articulated audience" (p. 358). Indeed, in the era of anytime, anywhere, and anyone, instructional design models require an agility and flexibility to embrace and improve not only the parameters of distance education environments, but also the socio-cultural context of the global learner (Crawford, 2015).

Khan's e-learning framework (Morrison, 2017) attempts to address these calls for change by presenting a holistic model for MOOC design that includes critical success elements for a sustainable MOOC initiative embedded within a design approach. Dalsgaard and Paulsen (2009) and Paulsen (2003) focus on ways to support the individual digital learner whereby collaboration is an optional component of the learning experience. The TAPPA process (Moore, 2016) applies an interactive, iterative and flexible design research approach (Oh & Reeves, 2010) to the design of instruction for Web 2.0 and 3.0 environments. In the Community of Inquiry (CoI) model (Garrison, 2011; Garrison, Anderson, & Archer, 2000), the focus is on the social, cognitive, and teaching presences and the role that collaboration plays in building knowledge. The Fully Online Learning Community (FOLC) model (Blayone, vanOostveen, Barber, DiGiuseppe, & Childs, 2017; vanOostveen, DiGiuseppe, Barber, Blayone, & Childs, 2016; Childs, vanOostveen, Flynn, & Clarkson, 2015) foregrounds the co-creation of learning communities to address authentic inquiry/problem-based learning situations and fosters democratized and emancipatory learning processes that are adaptable to the socio-cultural context of institutions and learners.

Concluding Thoughts

Recognizing the six pressures identified previously that impact post-secondary education, it is timely to consider design principles and technological affordances that post-secondary institutions could use to "find the right balance and the right time" to help reduce those pressures and create sustainable

Table 16.1 Revised continuum of pedagogical approaches

	Online Instruction	*Facilitated Online Instruction*	*Blended Instruction*	*Studio-Based Instruction*	*Design-Based Instruction*
Role of teacher/ student	Teacher-prepared content. Teacher-directed instruction. Teacher has minimal or no direct involvement with students. Need to students to participate online.	Teacher-prepared content. Teacher-directed instruction. Interaction between teacher and students. Need for both to participate online.	Teacher-prepared content. Teacher-directed instruction. Increased interaction among teacher and students. Opportunity for student-negotiated tasks. Need for both to participate face-to-face and online.	Teacher-prepared learning environment and initial problems/tasks. Student-centred approach. Active interaction between students and teachers. Changed roles for teacher and students.	Continuum from instructor-prepared design challenge/PBL/ inquiry or provocation to learn to learner co-created. Active peer/peer; peer/network interaction where instructor is viewed as part of the network.
Online approach	Asynchronous teaching/ learning. Learning controlled by time—fixed start/stop times.	Synchronous teaching/ learning options. Asynchronous options. Collaborative options. Learning controlled by teachers.	Synchronous teaching/ learning. Increased opportunities for asynchronous leanring. Opportunities for face-to-face collaborative options. Learning controlled by teacher.	Asynchronous learning with synchronous support. Collaboration. Online gallery with forum for student led, peer critiques. Learning negotiated by teachers/student.	Co-constructed by instructor and learners using Web 2.0 and Web 3.0 technologies to meet the requirements of the tasks/process.
Example of software	Content managed in learning management system (LMS) such as Blackboard, D2L, Moodle.	Content in LMS, support via email or synchronous software (i.e., Elluminate Live, MSN Messenger); online discussions.	Online discussions, LMS, synchronous conferencing. Physical classroom/lab environment.	Collaborative software (i.e., CMAP, shared whiteboards); simulations, VR, LMS, synchronous conferencing.	Collaborative software; social software; networked software; virtual communities; groups; sets (Veletsianos, 2016); PLE/PLNs.
Instructional strategy	Lecture/information transfer.	Lecture/discussion.	Lecture/discussion/task negotiation.	Lecture/discussion/task negotiation/problem solving.	Microlearning supports for inquiry/ PBL/ design thinking process.
Evaluation	Testing/computer marker (true or false, multiple choice, short answer).	Formal testing/teacher marked.	Formal testing/teach marked, potential for alternative, more open-ended assessment (essay, project, etc.).	Authentic assessment using checklists/rubric for project assessment.	Assessment on a continuum from instructor created to learner-created. Authentic assessment using checklists/ rubric for project assessment.

(*Continued*)

Table 16.1 (Continued)

	Online Instruction	*Facilitated Online Instruction*	*Blended Instruction*	*Studio-Based Instruction*	*Design-Based Instruction*
Link to Revised Bloom's Taxonomy	Knowledge level.	Knowledge level. Comprehension level.	Knowledge level. Comprehension level. Application level. Analysis level.	Potential for all levels, including higher-order thinking tasks, of synthesis and evaluation.	Potential for all levels, specifically higher-order thinking tasks of analysis, synthesis and evaluation.
Role of media	Text to read. Audio files (podcasts to hear). Images to watch.	Text to read. Audio files (podcasts to hear). Images to watch. Exhibits to explore. Simulations to engage with.	Text to read. Audio files (podcasts to hear). Images to watch. Exhibits to explore. Simulations to engage with. Demonstration to discuss.	Potential for all media to be used. Use media to dramatize personal experiences. Use media as a starting point for personalized learning and individual demonstration of understanding. Students create own media.	To make thinking visible (Eisner, 2002); to foster critical dialogue and discourse, to contribute; to share; for knowledge co-creation.

and relevant learning for contemporary learners in multiple contexts, including those in challenging locations with limited bandwidth, access or opportunities.

Common to the emergent instructional models mentioned earlier is the focus on flexible, adaptable, intentional human-centered design thinking approach that fosters connection, collaboration, contribution, and choice as integral parts of the learning experience. It is the recognition of the need for the co-creation of this experience—and the shared role the learner plays in creating, curating, and contributing to the learning allows for adaptation to the socio-cultural context—that sets these emergent models apart from their more traditional instructional design predecessors.

The additional column, added to Crichton and Childs Continuum of Pedagogical Approaches (2008), shown in Table 16.1, reflects a design thinking approach to learning. A design thinking approach can be defined as involving "collaboration and problem-solving. It encourages inquiry, empathy, curiosity, and divergent thinking . . . identifying challenges, gathering information, generating potential solutions, refining ideas and testing solutions" (Crichton & Carter, 2017). By applying an intentional design-thinking process-based approach to re-visioning distance education, educators can cultivate divergent, lateral thinking in support of problem finding and begin to address the pressures challenging their institutions.

The intentional design-thinking process-based approach to distance education, considered on both the macro and micro levels designing instruction, provides an interesting model and a process for addressing complex and wicked problems that are messy and representative of real—life. A design-based instructional approach is an approach to attend specifically to pressures two and five, suggesting learners can negotiate and navigate multiple ways to inform their formal learning explorations.

Distance education will continue to evolve and embrace changes in learner demographics, technological affordances, and pressures impacting the institutions where it is offered. Since its introduction, distance education has evolved and matured through its generations. Historically, it has not been a static field, moving from print to artificial intelligence, from courses mailed in boxes to video streamed through the Internet.

The six pressures identified previously in this paper relate to considerations of:

- Assessment.
- Student Engagement.
- Flexibility.
- Quality.
- Role of multimedia and its design and access to open content.
- Development of an institutional signature pedagogy (Shulman, 2005).

Each institution contemplating adopting distance education or modernizing existing approaches needs to consider its practice across a continuum of pedagogical approaches, attending to the pressures impacting their context. A consideration of design thinking and the adoption of a design-based approach may provide an intentional way to embrace the inherent challenges of each context and recognize the opportunity to provide innovative learning to a challenging demographic of learners.

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17

THE USE OF SOCIAL MEDIA IN HIGHER EDUCATION ONLINE AND BLENDED COURSES

Priya Sharma, Kimberly Tohill, Philip Tietjen, and Mahir Akgun

Introduction

Around the world, individual use of social media for work and leisure activities continues to increase. A recent Pew Research Center report[1] indicates that 69% of Americans used some type of social media in 2018 compared to just 5% in 2005, while 42% of the global population currently uses social media, an increase of 13% from January 2017.[2] Within the Web 2.0 landscape, social media allow individuals to share, co-create, and remix knowledge and artifacts via online social network sites to create affinity spaces (Gee, 2004) and engage in participatory cultures (Jenkins, 2009). The growth and use of social media has also impacted educational discourse and practice. Increasing attention has been directed to understanding the informal participatory and collaborative practices that emerge within the Web 2.0 and social media ecology (Ito et al., 2013), as well as the principled integration of such practices and tools in formal education settings (Greenhow & Robelia, 2009). While there exists a number of studies and reviews on the integration of social media in education broadly (Manca & Ranieri, 2016; Tang & Hew, 2017; Tess, 2013), the use of social media tools in online higher education has received less attention (Veletsianos & Anderson, 2010). In this chapter, we review empirical work on the use of social media for online education in higher education, and identify the main design and evaluation trends suggested by the research.

Perspectives on Social Media in Education

Web 2.0 has been broadly defined as a set of technologies and tools (such as blogs, wikis, RSS feeds, etc.,) that foster a socially connected web where individuals can create and edit information (Anderson et al., 2007). Some of the key practices of Web 2.0 include: (a) collaborative and distributed authorship; (b) active and multi-way interaction; (c) sustained production and reproduction of materials across contexts; and (d) open content and distributed ownership (Dohn, 2009a). In a further elaboration, social media have been more recently defined as: (a) being primarily Web-based applications; (b) being based on user generated content; (c) enabling the creation of user profiles/identification; and (d) facilitating the generation of social networks online by connecting with other individuals and groups (Obar & Wildman, 2015). Thus, individuals can easily interact and collaborate with others, build communities, and freely exchange content. Often, these interactions are highly organic and self-sustaining, triggered primarily by individual interest, based on voluntary, bottom-up participation, and involve geographically and spatially distributed communities

wherein the goal may not be about learning but rather the interaction (e.g., Kimmerle, Moskaliuk, Oeberst, & Cress, 2015).

With increasing individual engagement in social media, educational researchers and theorists have proposed a variety of conceptual frameworks to examine how individuals learn and interact within these online spaces. For example, Siemens (2005) advanced the notion of connectivism, which offers a network based view of knowledge access and learning. Ito et al. (2013) proposed connected learning as a design and research agenda for exploring learning that is networked and participatory, that uses new media to connect in-school and out-of-school learning, and that links individuals with diverse communities based on shared interests. These perspectives highlight the unique capacities of social media to connect individuals to communities and shared interests over time and space. Such affordances can directly impact the design of distance and online learning in a number of ways. First, the sense of connection and interaction can be seen as closely related to the attributes of social presence, defined as the sense of community experienced by a learner in an online environment (Chih-Hsiung & McIsaac, 2002). Higher levels of social presence have been identified as being important in helping online participants feel more connected and be more engaged in group processes. Social presence is also key in supporting student persistence in the online environment (McLoughlin & Lee, 2010). Second, the ability of social media to connect students to communities of shared interests and to extend learning connections to out-of-school settings can be a powerful way for engaging distant and online students in personal learning networks (Couros, 2010). Kop's (2010) research suggests that the core of a successful online learning experience is the ability for learners and facilitators to interact and communicate; social media tools make the experience multimodal, flexible, and more powerful. Kop argues for further investigations into the role and experiences of facilitators, students, and learning technologists in these online spaces, and specifically on the impact of this new environment on the quality of knowledge constructed and on learning experiences. In this chapter, we review and analyze literature related to social media use in higher education online and blended courses to identify learning impact and experiences.

Literature Review Process

We accessed a variety of educational databases (ERIC, ProQuest, WebofScience, Google Scholar, Mendeley) and searched for empirical journal articles using the keywords "social media," "higher education," "distance education," and "online education" with a date range of 2004–2017. We identified approximately 300 articles that matched the identified keywords over this period; a closer scan of abstracts reduced the number of relevant empirical articles to 146. We further refined our search to focus only on peer-reviewed articles that provided empirical reports on the use of social media tools for student learning. We eliminated reports that focused on faculty development or administration, and thus our final pool of articles included 65 reports that dealt directly with our focus. In the subsequent sections, we present key descriptive findings about the dataset, as well as more detailed themes that emerged from a close reading and analysis.

Overview of Reviewed Research

While the relevant research spans about a decade, published work on social media peaked between 2010 and 2013, with less work published before and after this timeframe (Figure 17.1). Since the terms Web 2.0 and social media were popularized around 2004, it is not surprising to see the gradual adoption into educational research; however, what is surprising is the apparent decline in empirical work in this area since 2014.

In our review, we found that a majority of the studies used a blended or hybrid approach to the use of social media tools, and only about 30% of the studies were completely online. Detailed reading

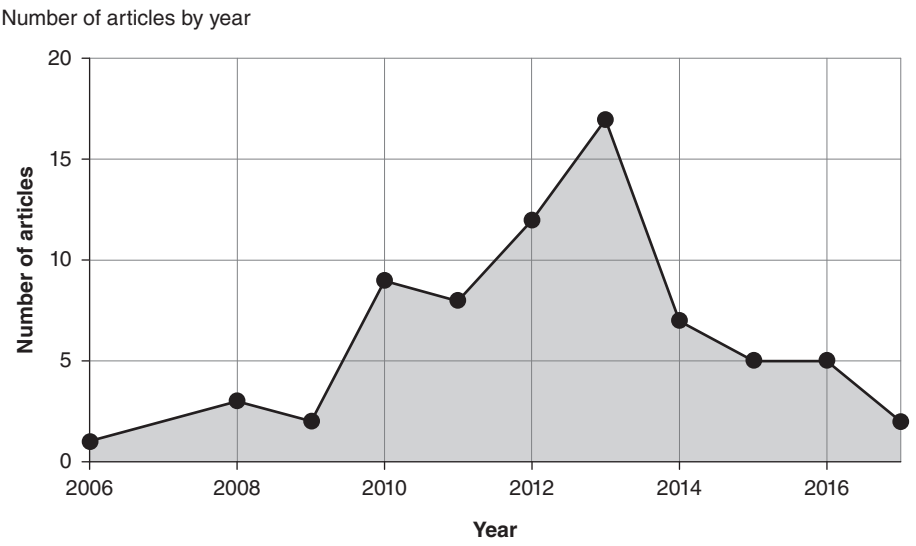


Figure 17.1 Number of articles published between 2006 and 2017

of the articles also revealed that the major foci of the research studies within our selected dataset were related to the use of social media for: (a) enhancing learning outcomes (17%); (b) enhancing face-to-face courses (14%); (c) fostering learning communities (22%); (d) understanding student perceptions of tool affordances (33%); and (e) increasing student engagement with social media (13%). Thus, almost a third of the studies focused on student perceptions of tools, and only a fifth on learning outcomes. The high proportion of studies focused on student perceptions is similar to Tess' (2013) findings in his review of social media in higher education. The majority of the articles referenced Facebook, Twitter, blogs, and wikis as the primary social media tools; other tools were mentioned infrequently.

Using Social Media to Enhance Learning Outcomes

The research on learning outcomes can be grouped into two broad areas: (a) the impact of the social media intervention on learning outcomes of students; and (b) a comparison of learning outcomes across students who used a social media tool vs. those who did not. A majority of research focused on hybrid or blended contexts, rather than solely online or distance based. As well, the goals of the research were varied.

The reviewed studies reinforce the critical role of careful design and integration of social media to support learning outcomes. When activities were based on theoretically grounded design and the use of social media was intrinsically tied to the course outcomes, learning outcomes were positively affected. For example, a study focused on wikis (Altanopoulou, Tselios, Katsanos, Georgoutsou, & Panagiotaki, 2015) examined the impact of deliberate wiki design and student role-taking on learning gains of undergraduate students in ICT and web science. Three compulsory wiki activities were designed using a structured theoretical framework; the instructor assigned students to groups of 4–5 members and gave them specific roles within the activity. A one-group pre-test, post-test design was used, and analyzed data indicated that students scored significantly higher in the post-test after participating in the wiki activity. In addition, students with lower pre-test scores showed significantly higher learning gains. In another study (Laru, Järvelä, & Näykki, 2012) that examined the impact of deliberate design on students' learning outcomes, undergraduate students were tasked with

completing a collaborative wiki project in combination with individual blogging and face-to-face sessions. To assess knowledge gain, students completed pre- and post-tests on the course content, and analyses indicated that all students had significantly higher scores in the post-test. A second stage of analysis examined which student activities were the best predictors of differences in learning between high- and low-scoring students. Wiki-related activities such as editing, adding, and refining content were most often completed by high performers. In addition, students who were active on the blogs were also most likely to be the ones who were active on the wiki.

In contrast, when participation in social media was either voluntary (Ravid, Kalman, & Rafaeli, 2008) or insufficiently emphasized in the overall course goals (Frisch, Jackson, & Murray, 2013; Liu & Lan, 2016), the learning outcomes were not significantly affected. Ravid et al. (2008) focused on the creation of a wiki textbook in an introductory information systems course. The study investigated the role of graduate and undergraduate students' contributions to the wiki textbook and its impact on their performance in the course. Students were asked to read and augment sub-chapters in the wiki textbook, as well as create new sub-chapters over a period of ten weeks. The assignment was compulsory in some courses, but elective in others. Wiki log data analysis indicated that a small number of students made the majority of the changes to the wiki, while the rest of the users made little to no contribution. T-tests performed on student grades showed a significant difference ($p > .05$) between wiki participants and non-participants in two courses, but not in two other courses. However, the study does not clearly indicate whether participation was required in all four courses; as well, the two courses that showed no difference were engineering courses, while courses that showed differences were management courses. The effect of discipline was not discussed in the research. Similarly, Frisch et al. (2013) focused on the use of social media tools to support undergraduate biology students' skills in critically assessing Internet source validity and reliability. However, the course did not directly address critical thinking, and instead students completed a single tutorial in the first week of the course. Students worked in groups over the semester to develop a final project, which included identifying a research question as well as evaluating sources related to the question. Students used Google sites and Google+ as the main repositories for the projects, in addition to bookmarking tools like del.icio.us and citeulike.org. Student critical thinking was assessed after the course using various tools, and students showed improvement (although not significant improvement) in critical thinking and the ability to frame research questions.

Liu and Lan (2016) examined the role of social interaction and collaboration in a hybrid English as a foreign language (EFL) class and examined the impact of collaborative vs. individual groups on vocabulary gain, motivation, and perceptions of using Google Docs for learning. Sixty-five students participated in the study, and one class was randomly assigned to the collaborators group while the other was assigned to the individual group. In addition to regular, face-to-face meetings, students were asked to complete six comprehension tasks outside the classroom using Google Docs, which accounted for 5% of the grade. A vocabulary pre-test and post-test was used to assess knowledge gain. A demographic and perception survey was also administered, and Google Docs data generated by the groups were also analyzed. Data analyses indicated that the collaborative group had non-significant vocabulary gain in the post-test, higher levels of belief and self-efficacy, more positive perceptions of Google Docs, and lower levels of test anxiety as compared to the individual group.

Comparing Learning Outcomes With and Without a Social Media Tool

A second theme around learning outcomes was the use of comparative studies of courses that used social media vs. those that did not. As with the first theme, the role of design is of paramount importance in assessing contributions of social media to learning. For example, Wichadee's (2013) study indicates that more or less equivalent designs based on strong theoretical foundations produce similar learning outcomes. Using a theoretical framework of collaborative learning, two undergraduate

classes in basic English engaged in collaborative writing activities, either face to face or on a wiki. Pre- and post-test data were analyzed, along with student surveys and the artifacts created by the students in both groups. There were no statistically significant differences between the groups' final test scores, although both groups scored significantly higher in their post-test. Both groups also appreciated the collaborative component of the work. Students in the wiki group cited more advantages than drawbacks to this method since they could work at their own pace and easily see other members' work. As well, the use of social media seemed to facilitate student engagement in learning in their own time and space.

Similarly, research by Kassens-Noor (2012) highlights the nature of learning and outcomes favored by each type of interaction modality—social media vs. paper. In this study, Twitter was used and evaluated as a potential tool for supporting active, peer-to-peer interaction as a compliment to in-class activities (Kassens-Noor, 2012). Two groups of students in a course on urban planning were tasked to use Twitter or a paper diary to identify examples of unsustainable practices and possible remedies. Students in the Twitter group were able to communicate with each other continuously while students who used the paper-based diaries presented their ideas to class members and received feedback once during the class. A variety of data, including Twitter feeds, journals, quiz results, and student surveys, was analyzed. Students who used Twitter showed more evidence of knowledge creation; however, the group using the paper diaries indicated greater retention. As well, Twitter students cited more group-based remedies than the diary group, which is unsurprising given the contrast between the collaborative and the solitary nature of the two activities. The study sequence was cited as a possible explanation for the higher retention of the diary group.

Walton (2010) examined whether the use of online social network learning via discussions using the learning management system Blackboard affected student learning. Undergraduate students in an information literacy course were assigned to one of two groups. After an initial face-to-face workshop, the experimental group received learning activities via Blackboard over six weeks, while the control group received no instruction other than the face-to-face workshop. A third group was also instructed via the face-to-face workshop and had access to all the resources provided to the experimental group, but was not given access to the designed online social network activities. Pre- and post-test comparison indicated that the experimental group outperformed the control group in the knowledge test; the difference between the groups was statistically significant. A limitation of this study is the lack of similarly designed and long-term engagement for the face-to-face group which only received one workshop on the topic. The study also provided insufficient detail on the robustness of the design for the student groups who did not use social media, and it is thus difficult to assess the quality of the comparison.

Enhancing Face-to-Face Learning With Social Media

A second overall theme that emerged from the reports was the use of social media to enhance in-class, face-to-face learning. In these cases, social media was used to create public environments to encourage students to learn from one another. Researchers and instructors alike utilized social media tools to effectively transform learning environments from traditional into hybrid configurations.

In some instances, the public nature of the online learning environments provided by the social media tools proved to be a rather fruitful benefit. Arnold and Paulus (2010) used Ning—a publicly available social networking site—to create an online presence for their undergraduate course in computer-assisted language learning. The researchers were interested in understanding how social network sites might support hybrid learning environments, and how they could provide a model of technology integration practices for future teachers. Though the main purpose of the Ning site was to serve as a place to submit assignments and as a central archive for course materials, researchers

found that students repurposed the site in ways that suited their specific needs. Students noted that Ning assisted community building among participants, and afforded modeling opportunities through publicly available work; conversely, they noted that the chat feature lacked authenticity because it was easier to speak in person when students were in the same room (Arnold & Paulus, 2010). Though Ning enhanced face-to-face learning in this course, it was not what the researchers intended to support. Indeed, this is an example of students' appropriation of technology to meet their specific needs.

Churchill (2011) intended to explore educational applications of blogs that could supplement classroom teaching and contribute to improved learning. The blogs were used in lieu of a learning management system and served as repositories for course materials, for posting artifacts created through course assignments, and for communicating with other students through comments. While the blogs did not contribute directly to learning of specific knowledge or skills, they did enhance the overall learning experience for students. Students found this technology particularly useful for modeling through the public posting of work (Churchill, 2011). Shih (2011) created a public learning environment by using Facebook to integrate peer assessment into an undergraduate English course. Participants concurred that Facebook-integrated learning was very effective in that it facilitated peer interaction successfully; specifically, participants noted the ease of learning from each other through the publicly posted writing on Facebook (Shih, 2011).

The use of Yammer to facilitate communication and collaboration among teams of students also evidences the importance of public posting as a source of modeling. Warner (2016) utilized Yammer to encourage asynchronous inquiry and communication outside of face-to-face class meetings. He found more frequent and detailed participation, as well as higher quality discussion, among students through Yammer; average scores on assignments also increased. Through public discussion, posting, and sharing of resources, students had models of how to approach various tasks through appropriate questioning, how to utilize the answers, and how to assess whether the evidence provided was of good quality. These public artifacts helped students to make sense of each other's thought processes, thus contributing to improvements in learning.

Two separate studies sought to enhance student learning through the use of Twitter in business courses. Lowe and Laffey (2011) encouraged students in a marketing course to follow a course Twitter feed designed to disseminate current information about events and issues in the field, as well as to extend face-to-face classroom discussion. Despite some reluctance to learn a new technology, students found Twitter to be useful in helping them relate classroom materials to authentic examples. While students expressed satisfaction and positive feelings toward the inclusion of Twitter, researchers noted that there was little interactivity between students and the social media tool. Rather than encourage communication among the course participants, Twitter functioned mainly as a one-way channel to convey information. There were few instances of students tweeting about the course or responding to tweets (Lowe & Laffey, 2011). In a similar study by Evans (2014), students in an information management course were encouraged to communicate with each other and with tutors through Twitter to explore how Twitter usage may relate positively to learning. Results showed a strong relationship between Twitter usage and student engagement with the course and other activities. Evans found no association between interpersonal relations and Twitter usage, much like in the study by Lowe and Laffey (2011). While both studies noted positive connections between Twitter and student learning, both identified the shortcoming that incorporating Twitter into a course did not necessarily improve student interactivity or relationships.

Fostering Learning Communities and Extending In-Class Interaction

One of the main goals of social media is to connect people to each other in ways that transcend barriers and meet users' needs; social media enables and facilitates connections in everyday life, as

well as in academic settings. Purposeful inclusion of social media in learning environments can serve to reduce transactional distance, improve social presence among participants, and enhance learning. Through their study of how to design an effective online learning environment, Novakovich, Miah, and Shaw (2017) found that not requiring and not supporting participation through social media led to "anaemic and tentative" participation (p. 84). By including social media participation as an optional component in the learning environment, researchers found that reliance on voluntary participation proved unsuccessful in supporting the community they intended to create (Novakovich et al., 2017). Including social media practice as part of weekly course activities emerged as a recommendation to improve its efficacy. The volume of output, as well as the level of interactivity shown through social media, evidenced user involvement, which can be increased by requiring a minimum amount of participation. Feliz, Ricoy, and Feliz (2013) studied Twitter usage in a graduate course and concluded that the large number of student-generated tweets evidenced a high level of commitment as well as a sense of belonging within the community.

In some studies, social media has been used as a tool to encourage connections not only among students but between the student and the content as well. In a graduate seminar wherein students were required to tweet at least once per week, Domizi (2013) determined that 47% of the tweets indicated connections to content and 59% indicated connections to other users. Throughout the course, students began to share more personal information in addition to the required academic information using the Twitter platform. As a result, 67% of participants noted that Twitter "helped them feel more connected to each other . . . and at the same time helped them be more connected with the content of the course" (Domizi, 2013, p. 50). Blogs have also been found to foster student-student and student-content connections. Top (2012) incorporated blogs into an undergraduate course for pre-service teachers through which they completed course projects and communicated with each other. Results showed that blog-supported exchange of ideas and development of interactive connections among participants improved the overall learning experience as well as increased feelings of belonging (Top, 2012). Another study by Lin and Jou (2013) indicated findings that were analogous to those identified by Top (2012), in that students who participated in collaborative projects through Google Sites exhibited stronger peer interactions and increased productivity as a result of the ease of collaboration with each other while also interacting with course content.

Cultural aspects of community building have also emerged through the use of social media tools. Students in an undergraduate course in rural South Africa utilized MXit—a mobile phone instant messaging software application—to communicate with others in their study groups. Makoe (2010) found students actively contributing content rather than passively absorbing it and attributed the engagement to students' appreciation of the comfortable context that MXit provided. MXit afforded participants a familiar space in which to interact where they were not concerned about external appearances and how others might react to them (Makoe, 2010). The space afforded participants the freedom to maintain autonomy over their own learning while still collaborating with others in productive ways. Makoe also noted how MXit supported and furthered the South African concept of *ubuntu*—helping each other; the tool not only facilitated learning within the course but also resonated with learners by positively reinforcing long-standing, shared cultural norms.

Likewise, a study of Spanish and American students demonstrated a similar finding through the use of Twitter and blogs to create an intercultural community for personal and academic exchange (Lee & Markey, 2014). These social media tools enabled learners to connect with each other in meaningful ways that encouraged cross-cultural learning from the perspective of the target culture while simultaneously constructing an intercultural community in which participants found a sense of belonging and support. Participant surveys evidenced the effectiveness of Twitter and blogs for establishing a positive, collaborative community in which students felt comfortable and empowered (Lee & Markey, 2014).

Student Perceptions of Social Media Tools and Affordances

A significant number of studies—almost a third of the studies within our data—focused on student perceptions of social media tools.

One line of inquiry within this theme was an exploration of students' perceptions of Facebook as an alternative learning management system (LMS). For example, Irwin, Ball, Desbrow, and Leveritt (2012) found that students perceived Facebook to be more convenient than the traditional LMS for accessing course updates and related information. While students valued the ease of access to course updates and materials, the majority nevertheless did not consider it to be an effective learning tool. Another study (Wang, Woo, Quek, Yang, & Liu, 2012) also explored students' perceptions of using Facebook as a substitute for a traditional LMS, and found that students cited as one of Facebook's chief advantages the ease of accessing and engaging in course communication and related materials (e.g., posting announcements, sharing resources, and hosting discussions). At the same time, students were also wary of its ability to protect their personal privacy. This concern was evidenced in two ways: (a) the instructor gaining access to their personal interactions on Facebook, or alternatively; (b) their personal friends gaining access to their academic performance on Facebook. Pimmer et al. (2016) integrated Facebook into a midwifery education course designed for women in rural areas and focused on their perceptions concerning ease of access and overall educational value. The researchers found that Facebook, coupled with mobile devices, enhanced access to educational resources, which participants perceived to add meaningful value. At the same time, however, these positive perceptions were tempered with concerns regarding infringements on personal privacy and family time. Other explorations of Facebook as a learning platform have considered its potential for building community. Within the context of an information systems class, Ractham and Firpo (2011) conjectured that Facebook, as a popular social networking system, could be used to build a community of practice. Such a community of practice, they reasoned, could be particularly beneficial in a class with extensive technical content and where students' existing or prior knowledge could be shared as learning resources for others. The majority of students in their study perceived Facebook to be an effective supplemental learning tool, but far fewer found it helpful enough to be used as the primary learning platform.

In addition to Facebook, researchers have also been interested in gauging student perceptions of Twitter as a tool for supporting learning in online or hybrid contexts. Liu, McKelroy, Kang, Harron, and Liu (2016) implemented both Twitter and Facebook in a massive open online course (MOOC). In this setting where enrollments can reach the thousands and where learners are scattered across many time zones, the researchers explored the potential of these tools to enhance connections and community. Overall, students perceived Facebook to be more helpful than Twitter. Interestingly, data analyses indicated that most tool use was carried out by a small percentage of active users, which led them to conclude that more scaffolding is needed in order to encourage a broader group of learners to engage with social media tools.

With specific regard to Twitter, a number of studies have reported that students have perceived it as helpful for quickly and easily sharing information, but less effective as a learning tool. For example, Thoms (2012) incorporated Twitter into an undergraduate, online information systems course with the goal of seeing how it might lower the barriers to information sharing. While students found it helpful for introducing new information into the course and facilitating opportunities to explore information outside the course, they were notably more skeptical of its effectiveness to support learning. In a different study, McArthur and Bostedo-Conway (2012) investigated students' perceptions of faculty who use Twitter. Rather than focusing on one or two classes, they asked a cross-section of undergraduate students to follow the Twitter accounts of specific faculty members. They examined student perceptions of how faculty use Twitter across three criteria: teacher credibility, immediacy, and content relevance. Analysis of survey results showed students' perceptions of instructor credibility

was related to the student's use of the tool. If students used it frequently, their perception of instructor credibility was higher than for those students who did not use it or who used it very infrequently. For the criterion of immediacy, student perceptions were higher if faculty responded directly to them on Twitter. Finally, perceptions of content relevance were higher among those students who indicated that they had read a professor's tweets. Similar to other studies of social media, McArthur and Bostedo-Conway (2012) also found that students were reluctant to engage with professors on Twitter because of privacy concerns.

In hybrid contexts, teachers have explored the potential of social media to facilitate and extend discussion beyond the immediate context of the face-to-face classroom. For example, Hutchison and Wang (2012) explored pre-service teachers' perceptions of a social networking and blogging tool to facilitate discussion of children's literature. Using a phenomenological approach, their interviews with students revealed three key observations. First, despite the intended design of the social networking platform to support social and personal interactions (e.g., friendship building), students perceived it more as a tool for posting or distributing assignment files. Second, the blogging tool held more positive appeal as it represented a new form of expression that suggested more affordances than conventional papers. Third, neither tool was perceived as an adequate replacement for face-to-face class meetings, as most expressed a desire for discussing the literature both online and offline. Other studies also looked at the potential for blogs to build community. In an open education course, Kerawalla, Minocha, Kirkup, and Conole (2008) opted to present blogging as an option rather than requirement in their online, graduate-level education course. Their analysis of interviews with participating students revealed that students' perceptions of the blogging activity were shaped by the degree to which there was a connection with a broader community. Kerawalla et al. (2008) suggest that from a design perspective it may be difficult to establish the value or relevance of blogs within the fairly limited time span of one academic term.

One of the most frequently touted benefits of social media/Web tools is the affordance for collaboration. Abreu-Ellis et al. (2013) investigated this benefit by designing an international collaboration as part of a second language learning project. This study involved a collaboration between two American universities and a Brazilian university, where students were offered a considerable variety of Web 2.0 tools (e.g., Skype, Google Docs, Google Maps, Bubbl.us, Screen-cast-o-matic) with which to collaborate with students in their non-native country. Students perceived Skype to be particularly helpful because it afforded them means for both seeing and hearing the person with whom they were communicating. In a second-language context, students perceived these visual and aural cues as crucially important in their progress toward their overall goal of learning a new language.

Recognizing the valuable role that social interactions play in learning, other researchers have turned to social media tools because they found traditional LMSs too limited in their capacity to promote social interactions. Thoms and Eryilmaz (2014) analyzed student perceptions of Elgg—an LMS alternative—that offers affordances more actively geared toward promoting social presence (e.g., avatars, user profiles) and easy integration with external social media clients (e.g., Twitter). In comparing four groups of students, they found that those who used the more social-oriented learning platform (Elgg) experienced higher levels of peer interaction and felt a stronger sense of community. At the same time, their analysis of student data also revealed no significant difference in students' perceived levels of learning between the two platforms. In a similarly critical stance toward the limitations of traditional LMSs, Chen, Hwang, and Wang (2012) report on an in-house, Web-based annotation tool (MyNote). Based on the premise that annotation promotes higher levels of active learning, they explored students' perceptions of this annotation tool in terms of four factors: interactivity, usefulness, helpfulness, and willingness for future use. Among these four, they found interactivity and helpfulness to be statistically significant predictors of future use. A key implication derived from this study is that making annotation systems more usable may also encourage more collaborative learning.

Student perceptions of social media tools were also examined in medical education contexts. Jaffar (2012) examined medical students' perceptions of using YouTube in an anatomy class. In this study, Jaffar used a dedicated YouTube channel specifically designed for the class, and he found that students accessed this more frequently than the LMS. In addition, results also showed that students found animations to be the most helpful type of video. In another medical education study, George and Dellasega (2011) investigated students' perceptions of multiple social media tools (Twitter, Skype, YouTube, Flickr, blogs). The researchers asked students to evaluate the tools across four key areas: (a) overall quality of the course; (b) course design; (c) teaching quality; and (d) helpfulness of electronic resources. Analysis of the survey results indicated students' perceptions of the tools were highly favorable because they viewed the tools as augmenting their learning and promoting collaboration. For example, students appreciated how YouTube was used to connect with experts and how Twitter enabled conversations to continue outside the classroom as well as improve their ability to write succinctly (e.g., no more than 140 characters at the time of the study).

Increasing Student Engagement With Social Media

Student engagement is generally defined as students' active participation in academic or school related activities. More specifically, it represents the time and effort students invest in educational activities (Kuh, 2009). The definition and application of the term student engagement varies among studies investigating social media tools. Some studies applied a narrow definition of student engagement focusing primarily on behavioral engagement (e.g., participating in learning or school activities), whereas others applied a broader definition by including less observable factors such as cognitive and emotional engagement. The research on student engagement, in addition to its definition (narrow vs. broad), can be grouped into two main areas: one focuses on the role of social media tools in enhancing student engagement, while the second explores student engagement in online programs.

The role of social media in enhancing student engagement seems to depend on the type of social media platform. For example, Junco, Heiberger, and Loken (2011) provided experimental evidence for using Twitter to enhance student engagement, while Cole (2009) showed that a wiki did not support student engagement in the class. Junco et al. (2011) conducted an experimental study in which 125 students in a pre-health major class participated. Students in the experimental group used Twitter as part of the class activities, while those in the control group did not. A Twitter account was created for the study, and students were asked to follow the account as well as follow each other to foster interaction within and across sections of the course. Twitter was mainly used to: (a) continue conversations begun in class; (b) provide students with a platform to ask questions; (c) send students class and campus event reminders; (d) provide academic and personal support; (e) organize service learning projects; and (f) organize study groups. Based on pre- and post-survey results, the experimental group showed a significantly higher difference in engagement between pre- and post-test scores than the control group.

In contrast, Cole (2009) conducted action research to understand whether wiki technology could be used to support student engagement, defined as active participation with the class wiki to generate course content. A wiki was integrated into the existing teaching format of a third-year undergraduate information systems course, and wikis were used to supplement face-to-face classes on alternate weeks. Data were collected via qualitative questionnaires, as well as group interviews. Findings indicated that the wiki did not support student engagement in the class. Sixty-eight percent of participants visited the wiki, but they had not posted due to the cited reasons: difficulties with using the technology, coursework deadlines from other modules that interfered with their ability to post, concerns about the quality of their contribution, and no interest in posting to the wiki.

In another study, Williams and Chinn (2009) assessed student engagement and information literacy skills by designing an active learning environment using various Web 2.0 tools. Students in an

undergraduate sports management course were tasked with developing a marketing strategy using Web 2.0 tools to promote attendance at a season-opening basketball game. The activity, worth 30% of the grade including both an individual and group component, was divided into four stages with guidelines, resources, and examples provided for each stage. Student teams were able to brainstorm and select among a variety of social media tools—all teams used Facebook, LinkedIn, and MySpace. Other popular tools were discussion forums (68%), email and text messaging (57%), and YouTube (22%). The instructor's observations and anecdotal evidence indicated engaging discussions in class, and final papers showed engagement of individuals and teams in the process. Student comments also indicated positive experiences and knowledge gain in the use of Web 2.0 tools.

Exploration of the construct of student engagement in online programs emerged as a second theme. For example, Pellas (2014) examined the role of self-efficacy, metacognitive self-regulation, and self-esteem in engagement in online programs at the university level which were held in Second Life. In the study, the term "student engagement" was used to refer to learning activities in which students demonstrated behavioral (i.e., students' participation in the classroom), cognitive (i.e., exerting an intellectual effort in learning process), and emotional (i.e., positive attitudes about the learning process) engagement. Second Life was not utilized as part of specific learning activities designed for the study. Instead, participants (N = 305) were randomly selected from courses that used Second Life to complete online projects. A questionnaire was deployed to measure the constructs under investigation. Confirmatory factor analysis and hierarchical regression analyses indicated that self-efficacy, metacognitive self-regulation, and self-esteem were predictors of emotional and cognitive engagement, whereas these factors were negatively correlated with behavioral engagement.

In another study, Salmon, Ross, Pechenkina, and Chase (2015) explored student engagement with Facebook and Twitter in a mixed-methods study of 1,000 participants in a MOOC. The MOOC was designed and delivered to help participants improve their skills of designing and developing online and blended teaching materials. In addition to the MOOC, Facebook and Twitter were also offered as venues to contribute to participants' collaborative learning experiences. A Facebook group was used to ask questions about the MOOC and discuss issues around work tasks. Students used Twitter to share thoughts, experiences, practical information, and resources. Survey, interviews, and Twitter and Facebook postings were the data sources. Data analysis revealed two themes in relation to engagement with the social media tools: learning improved by facilitating discussion with peers and moderators, and participants had greater networking opportunities. The main objections to using social media were: (a) a belief that it was a waste of time; (b) perceptions of the tools as confusing or intimidating; and (c) the blurring of social and professional identities.

Summary and Recommendations

Our review of empirical work between 2004 and 2017 on the integration of social media into online higher education courses indicated sustained interest by faculty in integrating social media into their courses and teaching. Of the reviewed research, 70% of the articles focused on undergraduate courses and about 26% focused on graduate-level courses. As mentioned earlier, major pedagogical themes related to the use of social media to enhance learning outcomes, contribute to learning communities, and improve student interaction. A significant portion of the research—a third of the reviewed studies—focused on student perceptions of using social media for learning.

The research indicates that while Web 2.0 social media platforms have existed since the early 2000s, educators and researchers are just beginning to explore how these tools might be used in the classroom to support specific pedagogical goals. Much of the work can be best classified as exploratory research, which can be characterized as a broad-ranging yet purposive undertaking to maximize understanding and description of a specific area of interest (Stebbins, 2001). Indeed, researchers employed a variety of quantitative, qualitative, and mixed-methods approaches and lenses

to investigate the use of social media in their contexts. The exploratory facet is most clearly documented in the section on student perceptions of tools. In most cases, leading with a specific pedagogical goal or need, educators used a variety of extant social media tools as well as custom-designed tools to support student learning, interaction, or sense of community. However, the main focus of evaluation was student perceptions of the tools, rather than the impact on pedagogical or learning goals. In some cases, student perceptions were sought because social media tools were being used as a substitute for another approved formal tool such as using Facebook instead of a standard LMS (e.g., Irwin et al., 2012; Ractham & Firpo, 2011; Wang et al., 2012). In other cases, a social media tool was used for the first time in a specific cultural context, for example midwifery in South Africa (Pimmer et al., 2016) or medical education (George & Dellasega, 2011; Jaffar, 2012), and researchers wanted to assess students' impressions of the tools as first time users.

The research also indicates that educators and researchers tried to map the use of tools in an educational context to the more organic uses that emerge on the open Web. For example, social media tools were used to engage students in communities of learning, to increase interaction, collaboration, and engagement among the participants, and to encourage cross-cultural and social interactions. The disconnect between the open-ended, voluntary, multi-way participation of individuals on the Internet and the more structured, closed-ended nature of formal education has been mentioned as a significant challenge in integrating social media in education (Dohn, 2009b; Kimmerle et al., 2015). However, within the examined studies, the educational uses of the tool were tied as closely as allowed by the specific context to the practices of the tool within the open Web and offered students a chance to participate in authentic contexts and practices. Also, as identified in some of the studies (e.g., Arnold & Paulus, 2010), the students appropriated the tools to match their own needs and goals—the ability to adapt tools for different purposes and outcomes is one of the defining characteristics of Web 2.0 tools. Thus, we see examples of students engaging in authentic Web 2.0 practices, as well.

Recommendations for Design and Integration of Social Media

Deliberate and thoughtful design is of paramount importance in supporting student use of social media tools toward defined goals. In instances when requirements for tool use were unclear (e.g., Frisch et al., 2013) or where tool use was optional (e.g., Ravid et al., 2008), no clear benefits of tool use were seen for either students or instructors. Furthermore, in investigating such implementations, educators and researchers would do well to regard the discussion around media comparison studies (e.g., Bernard et al., 2004) and be attentive to the fidelity of design implementations in comparative studies. In cases whereby implementation of social media tools was undergirded by strong theoretical design, benefits ranged from increases in targeted outcomes, more collaborative engagement between peers, availability of public models and artifacts of thinking, and a stronger sense of connection to peers that extended within and outside of the formal class space. However, when social media integration was neither central nor clear, students participated infrequently, and no significant differences were identified in learning outcomes, engagement, or collaboration.

Students' prior experience and facility with social media tools may affect not only engagement with the tools, but also affect their perception of the instructor. The "long tail" of participation on the Web (Anderson, 2004) also applies to participation within educational contexts, and our review indicates that students who are active users of social media are more likely to use them in their educational activities (e.g., Laru, Näykki, & Järvelä, 2012; Ravid et al., 2008). In addition, students who are frequent and/or expert users of a tool might be more likely to highly rate the credibility of an instructor who uses the tool (McArthur & Bostedo-Conway, 2012). Thus, designers and instructors must be cognizant of prior experience of students with the specific social media tools and identify ways to engage all students in the activities, while still accounting for the different levels of student

experience and knowledge. As well, instructors and designers should themselves have experience using the tool, thus supporting both well-designed lessons and positive student perceptions. At the same time, student privacy concerns should be respected and clearly addressed, as multiple studies identified students' concerns about their academic and social identities and lives overlapping (McArthur & Bostedo-Conway, 2012; Pimmer et al., 2016; Wang et al., 2012).

Conclusion

Social media have become an integral part of many adults' daily lives and everyday activities. Young adults in the United States are especially active users of social media, with almost 88% of them using social media in some form, while for teens, the percentage of users is close to 92%.[3] The active use of social media by young children and teens, the ubiquity of mobile and networked devices, and the increasing access to online social networks and resources suggests that social media will continue to have a vital role in the everyday lives of higher education learners. Educators and researchers must thus focus on: (a) careful design for integration of social media to support desired learning outcomes; (b) being cognizant of the practices afforded by different social media tools within varied contexts, and their potential contributions to learning; (c) identification of meaningful ways to assess student use of and learning within social media; and (d) purposeful connection between students' social and academic uses of social media to support connected learning and engagement in affinity spaces. Addressing these opportunities will also require educators to engage more actively with social media and be open to their integration within formal educational contexts.

Notes

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18

FRAMEWORKS FOR DESIGNING AND ANALYZING LEARNING

Activity Interactions in Online Courses

Vanessa P. Dennen

Online classes are potentially as diverse as their face-to-face counterparts. The learning that occurs in an online class may be simple and driven by relatively passive and impersonal pedagogical approaches (e.g., video lectures followed by automatically graded objective assessments). Alternately, it may be heavily influenced by interpersonal interactions and the discursive negotiation of knowledge.

Frameworks shape how one thinks about the learning interactions that occur in online classes. They serve multiple purposes for both practitioners and researchers. For practitioners, they provide the inspiration and grounding for many learning activities by serving as a reminder of the various components and constituents of an online course, and offering guidelines and principles for the design of learning activities. At their most concrete, they can be used as the basis for developing activity templates. For researchers, frameworks are useful in helping classify and understand the interactions that occur in the classes they study. Frameworks offer a foundation for designing and testing different instructional and interactional strategies for online learning, and for structuring and supporting data analysis in research and evaluation studies. In short, whether used by practitioners or researchers, frameworks help people see the array of instructional options and decision points in an online context, and better understand how elements of learning within an activity intersect.

This chapter focuses on the role frameworks play in supporting the design, facilitation, and research of online learning activities. It starts by examining some of the contextual factors that must be considered when designing or evaluating online learning activities. Next, it explores the concept of learning interactions—first from a transactional perspective, then from community and participatory culture perspectives. It concludes by discussing several research approaches that help elucidate the presence and meaning of different types of learning interactions. Along the way, it presents a number of frameworks that are used to support pedagogy and research in this area.

Contextual Factors

Instructors, course content, and assessments tend to immediately come to mind when thinking about classes. However, instructors, content, and assessments alone do not govern what happens in a class. A well-designed course and an expert instructor can flounder if other elements of the learning environment do not also support learning. The students, their needs, and various aspects of the learning environment help shape the interactions that occur—or do not occur—in online class activities. This

section explores the roles that people, motivation and purpose, tools, modality, temporality, and class size play in shaping online learning activities.

People

Online learning activities may vary based on the learner audience. Activities aimed at younger learners or novice learners may have more structure or guidance embedded within them, and also may require heavier facilitation. Conversely, adult learners who are experienced in the content area may benefit from activities designed with some flexibility. Relevance, which is a component of motivation (Keller, 1999), is of particular importance to adult learners (Park & Choi, 2009), and it may be promoted by allowing them to explore course topics in ways that are personally meaningful to them and that incorporate and even share their prior knowledge and experience. For adult learners, class participation has been linked to the perceived learning benefits of a course (Diep, Cocquyt, Zhu, & Vanwing, 2016). Individual characteristics also can be important. For example, learners with stronger self-regulation skills have been found to be better able to attain learning goals in online courses than learners who lack these skills (Kizilcec, Pérez-Sanagustín, & Maldonado, 2017), and new online learners have been found to experience online courses differently than more experienced ones (Li, Marsh, Rienties, & Whitelock, 2017).

Another people-related consideration is whether a group of learners brought together in a course or a different type of shared learning experience has existing relationships or mutual interests. When teaching an established cohort of people with common interests around a particular topic, less time needs to be devoted to activities that help establish rapport and foster comfort and trust and among co-participants.

Purpose and Motivation

People enroll in online courses for a variety of reasons, and these courses serve different functions in their lives. Understanding why a learner has enrolled in an online course can provide helpful insight when designing that course's online learning activities. In K-12 systems, online learning may be supplemental, or it may be done on a full-time basis (Watson, Pape, Murin, Gemin, & Vashaw, 2014). With the supplemental approach, these options help students—often those in rural areas—access courses not available to them otherwise, e.g., honors, advanced placement, and elective courses. As a full-time option, online learning at the K-12 level provides an alternative to both traditional schools and home schooling for students who either are not thriving in those environments (Lewis, Whiteside, & Dikkers, 2014), or who seek a flexible, institutional learning option. In higher education, online learning has broadened educational options for people who cannot attend classes in their chosen field on a college campus. It also has become a solution for institutions with physical space limitations and a flexible option for students who experience scheduling conflicts. In the realm of professional and continuing education, online learning is popular because of its geographical and temporal flexibility. Online environments may be used to deliver full courses, or briefer workshops and webinars. In some instances, self-paced or automated online courses—essentially, correspondence courses offered via the Internet—have become a practical means of providing instruction on demand or as needed in the workplace (e.g., intake training for a single new employee).

The needs of learners who are in a degree program may differ from those who are learning for more personal and self-directed purposes. Learners who participate in mandatory professional development and continuing education courses may also approach online learning differently from those who are more intrinsically motivated. Learners who enroll in online courses because their institution gives them no other option may have a preference for face-to-face courses. In these instances, their online enrollment is not intentional and they may resent feeling forced into learning via this

modality. These issues are all related to learner motivation to persist as online learners; higher motivation has been linked to learner participation and, in turn, their performance within a course (Barba, Kennedy, & Ainley, 2016).

Tools

A wide variety of tools is used to support online learning. It has become increasingly typical over the last two decades for institutions to adopt learning management systems (LMS) that support both learning and administrative functions. The LMS has become the standard course platform, and LMS use extends across course modalities. Face-to-face courses use them to host course materials and support administrative and grading functions, even if they are not dependent on these tools to facilitate learning interactions. For online courses, the LMS may host the bulk of the course learning interactions, or external tools may be used. Some of these external tools may be specifically designed to support online learning and collaboration, whereas others may have more general communication purposes. Tools also vary in the degree of privacy they afford instructors and learners (Dennen, 2015). Learning management systems tend to restrict access and interactions to the official members of a class, whereas many social media tools by default position learning in an open context.

Modality

A great deal of online learning occurs in classes that are not taught fully online. The term for these partially online classes is blended. Many individuals who are engaged in online learning may not consider themselves to be online learners because they also congregate in a physical classroom with an instructor and peers. Blended learning experiences are becoming the norm in many settings. Blended courses differ from online courses in that instructors can be selective about which activities occur in which modality, and the degree to which an instructor's class meets online vs. face-to-face also may influence these choices. For example, an instructor who teaches 90% of a course online, with only 10% of the instructional time reserved for face-to-face learning, may choose to use the relatively short time in which participants are co-located in a physical classroom for social-based learning activities or presentations. The bulk of learner-content interactions may occur online and asynchronously. In contrast, an instructor who primarily meets in a classroom with learners may choose to design an online learning activity specifically for the purpose of fostering learner interactions.

Temporality

Online courses have historically been classified as either synchronous or asynchronous. These descriptors refer to the temporality of a class activity, and have implications for the resulting interactions. Synchronous conversations are more spontaneous, but interlocuters must share the airspace, whereas asynchronous conversations may be more reflective and able to expand to include contributions from as many people who want to participate. Temporality is not necessarily an instructional design choice that online instructors make. Instead, learners select online courses that meet their preferences and needs. If an online course has a designated synchronous meeting time, the instructor may be able to require additional asynchronous interactions, but the converse is typically not true. However, sometimes asynchronous interactions mimic synchronous ones when learners are online and engaged in asynchronous course communications at the same time. With this in mind, researchers have recently questioned whether synchronous and asynchronous are sufficient descriptors for the temporal nature of online learners' interactions. Given the current range of tools and the increase

in mobile and wearable technologies, polysynchronous interactions are becoming a viable option (Oztok et al., 2014). From this perspective, the learner's actions and perceptions (not the tool) serve as the determinant for how the interaction should be described.

Class Size

Class size is another dimension that affects online learning activities. Although online classrooms do not suffer from the same physical limitations as on-campus classrooms (i.e., square footage, number of seats) and can potentially have an infinite number of learners, online learning activities only rarely succeed with an unlimited number of learners. This realization may be a disappointment to people looking to online learning to substantially reduce the costs of higher education while maintaining high quality (Deming, Goldin, Katz, & Yuchtman, 2015). Class size has been found to influence the effects of instructor participation on student participation (Parks-Stamm, Zafonte, & Palenque, 2017). With recent movements toward online learning on a massive scale, the typical massive course experience involves minimal or no instructor interaction, and a large emphasis on self-directed, instructive learning activities.

Online Course Interactions

Transactions as Course Interactions

Moore's (1993) theory of transactional distance notes that a gulf exists between learner and instructor when they are separated by space and/or time, as happens in a distance learning situation. That gulf is called the transactional distance, and it is both variable and subjective. Interactions that support learning are considered transactions, and any factor that inhibits the effectiveness of transactions is perceived as increasing the transactional distance.

From this theoretical perspective, learning is viewed as a series of transactions between learners and other course entities. Moore (1993) initiated a conversation about the types of transactions learners might have with different entities in a general distance learning context, and his work has subsequently been used to discuss online learning interactions more specifically. The three main interactions a learner may have in a course are with the content (e.g., the course readings and other learning materials), the instructor, and the other learners. These three forms of interaction introduced by Moore (1989)—learner-content, learning-instructor, and learner-learner—may not present in all online classes, but they nonetheless indicate potential transactions that could be designed into a course. In many instances, the learning process involves multi-faceted interactions. Learners do not simply engage with content at one point in time, and then disengage with the content in order to interact with their instructor or peers. Rather, learners are able to use tools like discussion forums to explore ideas related to content in a collaborative manner, and may also ask questions and receive answers, guidance, and feedback from their instructor in these same forums.

In addition to the three transactions Moore discusses in his theory, others have recommended examining learner-interface interactions as well (Evans & Sabry, 2003; Hillman, Willis, & Gunawardena, 1994), citing the necessity of thinking about the technology that learners use to access the people and content in their courses. The interface, while not a direct source of learning content, serves as a gatekeeper for other types of interactions. Supporting this assertion, Wei, Peng, and Chou (2015) found that student use and perceptions of the interface influenced the learning activities in which they partook, which in turn affected learning.

In some instances, the interface plays a much larger role than just providing access to learning content; it is part of the overall learning system. When adaptive technologies are used, the interface is inextricably partnered with the content. There is a systemic interplay between instructor actions as

they prepare content and interfaces for subsequent student interactions, which Ma, Han, Yang, and Cheng (2015) were able to model using learning analytics.

Specific learning transactions in online courses vary based on the instructional model that is used. Although all online learning is reliant on an interface, the prevalence of other types of interactions will vary with course design. Self-paced courses, like the mathematics course described by Cho and Heron (2015), allow learners to interact solely with content should they wish. Classes with both synchronous and asynchronous communications built in are reliant on a combination of learner-instructor and learner-learner interaction in order to thrive, and these interactions are related to student persistence and satisfaction in these courses (Cole, Shelley, & Swartz, 2014; Croxton, 2014).

Four technology-based phenomena of the last decade—the rise of social media, the flipped classroom approach, the massive open online course (MOOC), and learning analytics—have pushed educators to consider learning transactions from new perspectives.

Social Media and Leaner-Network Transactions

Noting that learners often transact with people and resources outside of their class about course-related topics, Dennen (2013) recommended considering transactions between learners and entities external to the class (learner-network interactions) as an additional type of interaction. These transactions include interactions between the learner and their online communities, as well as the array of networked human and content resources that a learner might encounter when using social media tools to investigate a course topic. This fourth type of interaction represents the broadening conceptualization of online learning possibilities in the social media era, and ties to the situated cognition model of learning. Applying the same approach that anyone operating as "just plain folk" would use to solve a problem or fulfill a need for knowledge or advice, learners build and tap into online social networks where they can find the help they need. Awareness of these learning transactions that occur beyond the purview of the instructor has been heightened by the rise of Internet technology. However, these interactions have always been possible. One example is when a student seeks homework help from a knowledgeable person in their life. That knowledgeable person could be a family member or neighbor, or could be someone whom they have met online in a discussion forum. Not all of these interactions occur without instructor guidance; an instructor might encourage students to reach out and develop social media based knowledge networks as a class activity (Dennen, 2018b), whether to promote learner use of informal strategies and personal learning networks (Dabbagh & Kitsantas, 2012; Greenhow & Lewin, 2016) or to encourage learners to engage in knowledge brokering and bring useful content back to the class for further discussion and exploration.

The Flipped Classroom

The recent flipped classroom phenomenon (for a comprehensive scoping review, see DeLozier & Rhodes, 2017; O'Flaherty & Phillips, 2015), although about blended rather than fully online classes, has renewed focus on the different types of transactions that occur in a class context. The flipped classroom approach to learning starts with the assumption that lecture is the default pedagogical strategy for a class. Although the geographical distance between instructor and learner in this setting is minimal, the interaction in a lecture is unidirectional and the potential for any given learner and the instructor to have a bidirectional interaction is low. The flipped classroom approach posits that students in a face-to-face course will benefit from using classroom meeting time for activities other than lecture. Lectures as a means of information transmission are not altogether discarded, but rather recorded and "flipped" to an online format. Students can access and learn from the lectures (learner-content interaction) as part of their homework, and during class meetings will have time to interact with their instructor and their peers. In short, the spotlight has been turned

on learner-learner and learner-instructor transactions as the key learning activity, with content relegated to a supportive role.

Massive Open Online Courses

More recently, massive open online courses (MOOCs) have provided the opportunity for researchers to explore course interactions at a scale previously not possible (Reich, 2015). Although MOOCs tend to differ from university courses along several dimensions, most notably the voluntary nature of MOOCs combined with little or no consequences for dropping out (Naidu, 2015), they have served as research playgrounds with large numbers of participants. Naidu (2015) commented that MOOCs generally replicate an information-dissemination model of instruction, heavily reliant on video lectures and reading materials, with limited potential for instructors to interact with learners. However, the design for learning at scale has not entirely ignored the need for interaction, and has placed an increased focus on peer interactions as well as use of interactive technologies. While the generalizability of MOOC-based research to other online learning contexts is questionable at best, MOOCs provide a variety of open examples of online learning activity designs, many of which have been documented and studied. Finally, the mere presence of MOOCs has challenged notions of online class size and what is possible in formal educational contexts.

Learning Analytics

Online learning generates a tremendous amount of data, some visible on the front end (e.g., messages posted by the instructor and learners) and the rest collected on the back end (Dennen, 2016). This back-end clickstream data contains details of how individual users interact within the course. The field of learning analytics can help researchers and practitioners learn how to best use these data points to detect, describe, and predict patterns of interaction. Learning analytics have helped capture the interaction patterns that lead to successful participation in learning activities and attainment of learning outcomes. Analytic dashboards can be used to deliver data about student performance on learning activities to instructors, who may use the data for assessment and evaluation purposes. Although the potential predictive power of learning analytics is alluring, researchers have cautioned against over-generalizing across learning activities and contexts (Gašević, Dawson, Rogers, & Gasevic, 2016; Hernández-García, González-González, Jiménez-Zarco, & Chaparro-Peláez, 2015).

Interactions From a Participatory Culture Perspective

Two of the activity frameworks reflect pedagogical trends in which learners are encouraged to be active participants in the larger online ecosphere, building networks with people outside of their class context and accessing, creating, and sharing knowledge artifacts alongside these people. Although many of the frameworks presented in this chapter have an underlying social constructivist foundation, the participatory culture and social media knowledge activity frameworks additionally reflect the type of pedagogy that Siemens (2005, 2006) refers to as part of the connectivist approach to learning.

Participatory Culture Framework

Participatory culture describes the socio-cultural expectation within Internet environments—and particularly among young people—that individuals are welcome and expected to be creators and contributors (Jenkins, 2006). Shifting the balance of power from more traditional contexts in which a relatively small and elite group produces information to be consumed by others, participatory

culture sets information production and consumption on a level playing field and suggests that anyone and everyone might be equally involved in both activities. Within this framework, everyone is not required to be an active participant or creator, but they are welcome to do so (Jenkins, Purushotma, Weigel, Clinton, & Robison, 2009). Jenkins (2006) classified the four different types of participatory activities that learners engage in on social networking sites as follows:

1. **Affiliations:** The memberships and connections that individuals make as they join and interact with others in social networks.
2. **Expressions:** The myriad ways in which individuals may produce intellectual and artistic works.
3. **Collaborative Problem Solving:** Working together with others to create knowledge, perform tasks, and develop solutions.
4. **Circulations:** Ways of delivering a stream or feed of content via different Internet platforms.

From across these activities, a set of critical skills for individuals to develop has been identified, such as distributed cognition and collaborative intelligence (Jenkins et al., 2009).

The participatory culture framework was derived originally from activities in informal settings, as a way to describe what individuals were doing naturally during the course of their everyday lives. Over time, it has come to influence other aspects of life, such as education. Halverson and Shapiro (2013) noted the importance of considering the participatory culture that has arisen around social networking sites when thinking about learning technologies. When online learning activities are designed within a participatory culture framework, they incorporate learner-driven interactions, and likely involve transactions with learner-selected and -created content, co-learners, and quite possibly individuals from the world at large.

Online Knowledge Activity Framework

Another way of viewing online interactions in a participatory culture is through the online knowledge activity framework (Dennen, 2018a, forthcoming). This approach focuses on the intersection of knowledge activities and learning activities, with an emphasis on combining the two to achieve desired learning outcomes. This approach was developed to help explain the ways in which online tools can be adopted to support active learning processes. Briefly, this framework suggests that the following knowledge activities form the core types of active learning when social media or similar online technologies are involved:

1. **Collecting:** The act of identifying and saving knowledge artifacts on a specific topic.
2. **Curating:** Evaluating collected artifacts and forming selective groups of them, with meaningful labels and annotations.
3. **Sharing:** Making artifacts—whether original creations, mashups, or found items—available to specific people who might find them interesting.
4. Making network connections and enabling purposeful knowledge transactions from one group of individuals to another.
5. **Negotiating:** Engaging in discursive exploration of knowledge artifacts with other people for the purpose of seeking a mutual understanding.
6. **Creating:** Developing new or adapted artifacts, either individually or collaboratively, for consumption by an online audience.

Common to all of these activities is the active position of the learner. Whereas in a more teacher-centered approach, the learner would be presented with content and asked to produce evidence of

learning that meets predetermined specifications (e.g., answer objective-style questions or write an essay on an assigned topic), when these knowledge activities are used in an online classroom, the instructor cedes at least some control to learners over both learning content and learning products. Learning activities anchored around this framework can be assessed for both process and product, and are consistent with open pedagogy (Hegarty, 2015).

Interactions From a Community Perspective

The term "community" is perhaps one of the most overused and poorly defined concepts related to online learning, used loosely to indicate any collection of people who might share the same online space or use the same online network. While many online learning interactions involve two or more people, these human interactions alone do not generate communities. However, the concept of online learning in communities has become quite prominent, supported by the belief that learners who have developed a sense of community—a concept introduced by Rovai (2002) and subsequently developed and studied by many others (e.g., O'Flaherty & Phillips, 2015; Phirangee, Epp, & Hewitt, 2016; Yilmaz, 2016)—are less likely to drop out than learners who lack a sense of community (Lee & Choi, 2011). Recent research continues to support the importance of learner-instructor and learner-learner interactions for promoting learner persistence, but also shows the mediating role of learner-content interaction (Luo, Zhang, & Qi, 2017). Two community-oriented frameworks that provide specific guidance for considering the systemic interplay of these online learning interactions are the Community of Inquiry and Community of Practice.

Community of Inquiry

The Community of Inquiry (CoI) framework is used to support social constructivist learning processes. Much as the name implies, a CoI is a group of people who come together to learn via collaborative discourse and reflective processes. A class can be set up to be a community of inquiry, and many online classes use this framework to support course design and facilitation (e.g., Szeto, 2015). Within a community of inquiry, there are three types of presence that guide learning—social presence, teaching presence, and cognitive presence—that work together to support learning (Garrison, Anderson, & Archer, 2010). More recently, a fourth presence—learning presence—has been suggested (Shea et al., 2014), although this idea has been rejected by the one of the original theorists (Garrison, 2017a). Some researchers have explored individual types of presence in isolation, but one of the initial theorists suggests studying them in isolation is inappropriate because their interdependence is a key element to their effectiveness in an online learning context (Garrison, 2017b). However, the effectiveness of this framework for supporting learning has recently been questioned (Maddrell, Morrison, & Watson, 2017). Additionally, social presence has meaning outside of the CoI framework (Lowenthal & Snelson, 2017) and a recent meta-analysis (Richardson, Maeda, Lv, & Caskurlu, 2017) confirmed that social presence is strongly related to student satisfaction and perceived learning.

Community of Practice

The Community of Practice (CoP) framework describes a group of people who share a common activity, whether a profession or a hobby, and who interact with each other in a manner that supports knowledge sharing and development about that activity (Lave & Wenger, 1991; Wenger, 1998). Members of a community of practice can participate on different trajectories; whereas some individuals serve as insiders who are well known and highly active within the group, others remain on the sidelines and observe more than they interact. Within a community of practice, this peripheral form of participating is recognized as offering value to some community members. Unlike a formal

class setting wherein learners are expected to each individually engage with peers at a specified minimum level and in particular ways, with the goal of similar activities and outcomes for all, within a community of practice members are free to engage in the manner that best suits their individual needs. This does not mean that interdependence does not exist within a community of practice, but rather that the interdependence of a community of practice is not predicated on every member contributing in the same ways.

By definition, the typical online class is not a community of practice; simply congregating a group of people for a short, defined period to attain similar outcomes is not enough. Although frequently cited as a theoretical framework in online learning literature, more work is needed to fully explore how this theory can be effectively applied to online learning (Smith, Hayes, & Shea, 2017). Nonetheless, the concept of community of practice can be used as inspiration for supporting the development of community within a course, and there are clear parallels between the discursive interactions that occur when people learn in a CoP and in many online courses.

Both of these community-based theories are often recommended as approaches for promoting successful online learning experiences; CoI provides a formal learning framework whereas CoP better relates to informal learning and professional development. While many exemplars of online education require interaction and perhaps greater forms of interdependence among learners, Moore (2016) notes that the group is not a magical answer to all online learning needs and contexts. In other words, working with others does not inherently promote learning, and to solely treat a collection of learners as a group is to overlook critical elements and needs of the individuals within that group. Although learners often do support and learn from each other, Moore (2016) provides a helpful reminder that independent learning remains a viable option for some online learners.

Interaction Frameworks for Research

Activity Theory

Activity theory provides a framework for examining what people do within social, cultural, and historical contexts. Simplified and situated in a learning context, the theory promotes a systematic exploration of learning as an activity. In contemporary educational research practice, activity theory usually manifests as the activity system, a multi-faceted device for describing the elements of a specific human practice that are present and collectively influence outcomes.

Vygotsky (1978) and his student Leont'ev (1978)[1] provided the initial conceptualization of the activity system. In their system, a tool serves as a mediating force between a subject and an object, leading to an outcome. Within this activity system, "tool" is defined broadly and is just as likely to be a sign or symbol (e.g., language) or a process as it is to be a physical item. Building on their work, Engeström (1987, 2001) developed the activity system into the model that is currently used by researchers, and Yamagata-Lynch (2010) helped operationalize the use of activity theory in educational research through activity systems analysis.

Activity theory encourages the view that online classes are complex ecosystems. Within these systems, learners and their instructor have a shared virtual space in which to interact with course materials and work toward the course goal. Figure 18.1 shows a generic activity system for an online class. Within this generic activity system, the subject is the student, and the object is course completion. Ideally, learning is an outcome. The activity system, through the sum of its parts and the tensions among them, describes the context in which an online learning activity might occur.

Exploring this basic activity system, the community (or key individuals) are the instructor and students. Others who may support the class (e.g., staff, administrators) or who are stakeholders in the learning process (e.g., students' parents or employers) may also be considered part of the larger

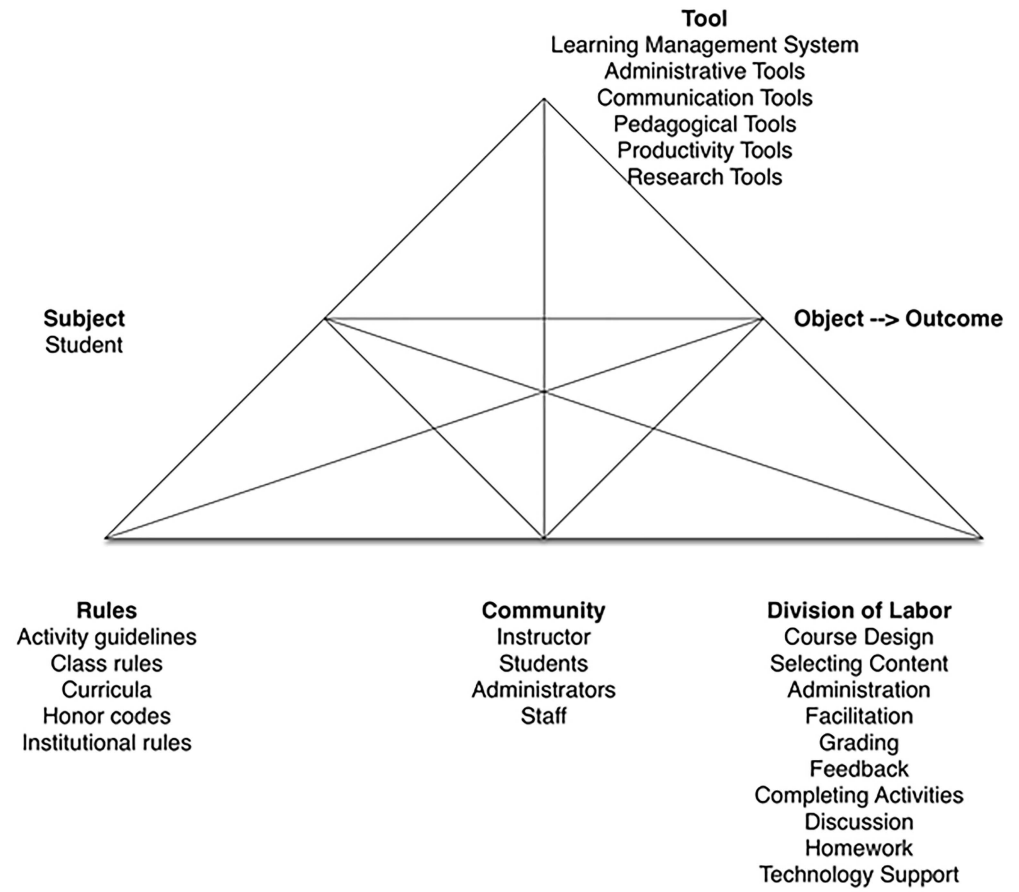


Figure 18.1 Online learning activity system

community that plays a role within the activity system. The rules that govern this community of learners range from those set externally to the classroom (e.g., institutional policy and honor codes) to those determined by the instructor (e.g., syllabus, assignment guidelines) or collectively determined by the class (e.g., group interaction norms). The division of labor likely positions the instructor as the person who performs tasks like course design and development, facilitation, and assessment. Students are typically responsible for tasks like reading, studying, and completing assignments. Various tasks can be paired, such as asking and answering questions or submitting and grading assignments, showing the interdependence of different class members. Some tasks may involve shared labor, depending on how the course is designed. For example, everyone may be expected to attend synchronous events, engage in discussion, or provide class members with feedback. Finally, the tools used to enable the online learning experience need to address a variety of learner needs that arise during online instruction, including administrative, pedagogical, social, and technical ones (Berge, 1995; Bonk, Kirkley, Hara, & Dennen, 2001). Most likely, a learning management system hosts the course and email is used for personal communication between the instructor and students. Additional tools may include library and Internet databases, and resources for conducting research and accessing content; productivity-based software for completing course assignments, and a variety

of pedagogical and communication tools that can be used in conjunction with the learning management system.

The activity system framework has value for online instructors because it can be used to help them identify and visualize the varied elements that must work together in order for the object to be achieved. If rules are contradictory, division of labor unclear, or tools dysfunctional, then the outcome may be frustration more than learning. For researchers, its value lies in its capacity to describe the full richness of an online learning context and to highlight the ways different elements work together—or create disruptive tensions.

When using activity systems analysis, researchers are encouraged to consider the tensions that arise between different elements of the overall system. For example, there might be tension between the students' and instructor's perspectives of division of labor in online courses. Although instructors are typically considered responsible for tasks like course design, facilitation, and assessment (Hung & Chou, 2015), it is possible to share some of these duties with students. However, students may resist such tasks or prefer that the instructor to maintain traditional course responsibilities, as was found in Hew's (2015) study of peer facilitation. In other recent studies, activity theory was used to elucidate differences between student and teacher perceptions of dialogic course tasks (Westberry & Franken, 2015), to identify different functions and levels of learning management system use across courses (Park & Jo, 2017), and to explore the outcomes of a participatory online course design process (Yamagata-Lynch et al., 2015).

Kang and Gyorke (2008) compared Moore's theory of transactional distance with activity theory. They noted that while both theories require considering mediation and participation, they do so in different ways. The theory of transactional distance provides a useful framework for exploring the potential interactions that may occur between individuals communicating at a distance, whereas activity theory provides a framework for exploring how the overall system of tools, rules, people, and work must be navigated in order to attain the desired object, and also shines light on other outcomes of this systemic interplay.

Positioning Theory

Positioning theory is a framework that originated in social psychology. It is used to investigate discursive interactions (van Langenhove & Harré, 1999). In recent years, it has been adopted by researchers across many fields to examine everything from subtle shifts of power in a simple conversation between two individuals to how individuals position themselves within a larger societal discourse (Harré, Moghaddam, Cairnie, Rothbart, & Sabat, 2009).

Per positioning theory, every utterance or speech act can hold information about the position of the speaker, the listener, or a third party. In an asynchronous online class, posted messages count as speech acts, whereas in a synchronous class, speech acts are verbal utterances or typed chat messages. Positions differ from roles, functioning at a more fluid, micro level. In a class context, "teacher" and "student" are the expected roles that individuals undertake. Each of these roles brings with it expected positions. For example, a teacher might be expected to hold power and authority, to be the subject matter expert, and to be the leader or guide of the conversation. Additionally, the teacher may be expected to confer approval on others, declaring their contributions correct or making corrections as necessary. Conversely, the default learner role is to follow the teacher's plan, defer to the teacher, and do as asked. The learner is expected to complete assignments and seek the teacher's feedback on their performance.

Positions can either confirm or challenge these roles. Within these roles, which are fairly well established in educational contexts, individuals may take on different, and sometimes temporary, positions relative to the others who share the class space or interaction. Each discursive act provides

the opportunity for an individual to perform a position for themselves (first-order positioning), to position someone else, to hold someone else accountable to a particular position, and to accept or reject a position suggested by someone else.

Positions are fluid, negotiated, and fit within a temporal location in a storyline. They are determined by social forces within storylines, whether intentionally or tacitly (van Langenhove & Harré, 1999). When tacit positioning is used, individuals simply assume positions for themselves and others. Positions may be seamlessly accepted when they fall in line with well-established roles and tasks (e.g., the teacher expects student to submit the assignment, and the student expects the teacher to grade the assignment), they also may be rejected or challenged in the event of a breach condition that does not fulfill default norms and expectations (Garfinkel, 1967).

In online learning research, positioning theory is useful for researchers who study discussion. It can be used to examine how instructors and learners express identity, power, and knowledge (Dennen, 2011; Walker, 2017). Awareness of positioning in online discourse also can be useful from an instructional design and facilitation perspective. For example, if an instructor wishes to increase the learner-centeredness of a particular activity, then it becomes necessary to position the learners as leaders for the activity. Learners who typically expect instructors to hold power and expertise may be resistant to such approaches, and may try to hold the instructor accountable for providing content, leading discussions, and affirming their activities.

Conclusion

Whether used to support the design or study of online learning activities, these frameworks share a common goal: to describe the interactions that may occur within online learning activities. Most of these frameworks are focused explicitly on learning activities that involve discursive human interaction (learner-learner or learner-instructor) rather than self-directed, learner-content activities. The heavy focus on discourse—and relatedly community, identity, and participatory culture—across these frameworks reflects both the popularity of discussion-based classroom approaches and the challenges of identifying best practices within these dynamic environments.

On a final note, in many online learning activities, there tends to be a focus on communicating over listening, presence over absence, and visible activity over inactivity. Basically, online learning research has focused more on what people do than on what they do not do. The field of learning analytics is helping to make passive online learning activities (i.e., reading) more visible, but cannot account for the case of silent learners, whether they lurk or are wholly absent. In this sense, research into online learning activities may be missing opportunities to better understand why some learners are silent or absent, whether consistently or situationally. Recent calls to attend to these issues include Oztok (2017), who presents the idea of social absence (i.e., the components of one's identity that are filtered out within an online environment, perhaps purposefully in order to fit in), and Phirangee and Malec (2017), who discuss ways that learners who are somehow different (e.g., from different cultural backgrounds) may find themselves othered and consequently be rendered silent.

The success of online learning activities depends on learners being present and visibly active. Just as the frameworks addressed in this chapter might be used to support instructional design and research functions, they also might be used to identify challenges facing online learners, such as initiating interactions with peers, feeling a sense of belonging within a community, engaging in participatory culture, and understanding the norms and practices of other learners within the class. Once identified, these challenges can be addressed through means such as supportive learner-instructor interactions, a welcoming class culture, clear directions specifying interaction expectations and parameters, and more choice of how to fulfill certain class requirements.

Note

1. Both Vygotsky's and Leont'ev's work predates the citations provided in these paragraphs by several decades. The publication dates represent the translation and publication of their work in English during the 1970s, when this work received renewed attention by educational psychologists interested in constructivist learning theories.

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19

THEORY TO PRACTICE IN INSTRUCTIONAL DESIGN

Rick L. Shearer and Eunsung Park

With the fourth edition of the *Handbook of Distance Education*, we are on the cusp of the third decade of the online movement in distance education and within our traditional resident instruction courses. Much has changed since the late 1990s, and as online learning has matured, we find ourselves moving beyond the hype and once again asking very deep questions about distance education at the institution level and at the course level. Our experience has grown and our technologies have matured, and the notion of materials and content has changed. Thus, more than ever we need to look at our designs and how they interact with our faculty, students, institutions, and society in a systems view. There are many questions that are emerging around distance education and our course designs. Some of the key questions include the following notions.

Design Team vs. Individual Faculty: Our tools now allow our faculty to easily craft an online course in a learning management system (LMS) and integrate other third-party tools. Although some faculty may not be versed in the pedagogical principles, the template approaches can guide them through a well-thought out approach. Without a design team approach, however, this may impact accessibility requirements in the design and the ability to integrate rich media that is original and produced for the course.

Personalization vs. One-Size-Fits-All Cohort Model: We see more examples of trying to move to a more personalized model that is likely outside of the LMS. These include adaptive learning models, competency-based models, and institutional models like that of Western Governors University. However, we need to weigh the pros and cons of our personalized models against our notions of the social construction of knowledge, autonomy, and scale of our distance education operations.

Content-Centric vs. Learner Control and Ability to Negotiate Learning Objectives: Over the years, content has been the main focus in distance education. From our correspondence days, to education radio and the first two decades of online learning, content was king. It was what we focused upon to assure scalability and a standardized learning experience. Today, with publishers moving away from traditional print-based models and with the proliferation of content on the Internet, is this still where we should focus in terms of our designs, and should we allow more learner control in terms of negotiating the content students select to meet the learning outcomes (group-based or individual)? So while content may still be highly valued as discussed in the study by Miyazoe and Anderson (2010), is it central to our designs?

Breadth vs. Depth: Should our courses and designs continue to follow the traditional 10-week quarter or 15-week semester formats, where we tend to move to a new topic each week, or should we narrow the focus and go for depth of understanding and more engaged open and trusted dialogue that spans two or three weeks?

We find ourselves faced with many questions and opportunities centered around how we think about our distance education courses and our designs. While the key design factors that have been highlighted in previous versions of this chapter remain, and the relevance of our theories and models of distance education continue to be the underlying framework for our design discussions, we have many concepts to consider within a systems view. Further, we must take a hard look at whether we should continue to replicate the face-to-face experience online or reconceptualize the experience. In this chapter, we will explore these questions within the framework of the theory of transactional distance and the Community of Inquiry model, and also challenge some of our previous thinking around the ideas of structure, autonomy and teaching presence. We will also continue to explore how the five key factors that have emerged in previous versions of the chapter may change, and if other key factors have emerged. However, central to distance education and to the design of our courses is the audience we serve. While we are seeing younger students migrating to distance education, our primary audience continues to be the working adult who is balancing their career, family, and other life obligations with their desire to further educate themselves. Also, in distance education there remains an underlying acknowledgment or understanding that a particular technology or group of technologies is being utilized to bridge the distance between the student, the instructor, and learning organization. Key to any one of the technologies chosen is how it allows or does not allow the other elements of the course to behave in a systems environment. Further, it is important to understand that online learning is just a subset of the distance education world and it should not be automatically assumed that the technologies used in distance education will be Internet-based, or that any of the students will be located in the same physical location as the instructor. We must also realize that there is no single technology that addresses all the needs of learners or the results expected by the constituents involved in the distance education enterprise.

Theoretical Framework

Without going into a full review of the theory of transactional distance (see Chapter 3), it is important to review the theory in order to form a framework for the key design factors. Moore's (1980) theory of transactional distance remains one of the theories central to the field of distance education (DE) and has a profound impact on instructional design for distance education courses. However, we need to continuously examine the constructs of the theory to see if they continue to hold true in today's distance education learning environments. Similarly, the Community of Inquiry model/theory by Garrison, Anderson, and Archer (1999) provides an enhancement to the theory of transactional distance framework in terms of social presence and cognitive presence within online learning environments. As we explore these theories/models it is important to remember that the theory of transactional distance emerged during the independent study days of DE (print, educational TV, radio, computer-aided instruction [CAI], etc.) from the early 1970s to the early 1980s, and thus its focus was that of highly individualized or personalized learning experiences. Later, the community of inquiry was introduced during the early days of online cohort courses, in the late 1990s and early 2000s, and thus it has more of a group-based focus—although this does not mean that both theories do not have value across the vast spectrum of distance education learning experiences.

Transactional Distance

Moore explored his ideas for the theory of transactional distance throughout the 1970s, as he examined numerous distance education courses. The resultant outcome was a proposed system of linkages between three key variables: (a) dialogue; (b) structure; and (c) learner autonomy, with transactional distance being the outcome of the interplay between the variables. The interaction of these variables plays out differently for each individual as one finds the balance from lesson to lesson that works for them. At one moment, they may desire more structure and less dialogue and autonomy, and at the next stage they may want more autonomy and less structure to allow for personal exploration of a topic. The interplay between these variables will determine the level of transactional distance that any one student is experiencing at a particular point in time or within a lesson of a course.

As Shearer (2010) states in his work on dialogue in transactional distance, "transactional distance in learning environments is an educational exchange that happens at a distance. The effectiveness and efficiency of the exchange depends on dialogue, structure, and autonomy, and is affected by a psychological dimension of connectedness" (p. 2).

Dialogue, at the time the theory was introduced, was viewed as a subset of the communications between the student and the instructor that led to the construction of knowledge or advancement of a student's understanding of the material being studied. Although Moore (1993) added the idea of learner-learner interaction/dialogue later on, the overall impact of dialogue across the spectrum of interactions was still personal in how dialogue helped lead to knowledge construction. Structure, within the theory, was viewed as the amount of freedom a program provides the student in determining pace, sequence, learning objectives and outcomes, and assessment strategies; learner autonomy looked at the degree of dependence the student needed with the learning organization or learning environment to be successful.

In general, the theory of transactional distance is the resultant of the interaction between the three variables, dialogue, structure, and autonomy (Figure 19.1).

On one dimension, the theory looks at how structure and dialogue interact. As diagrammed by Saba (1989), in a systems model, as dialogue increased, transactional distance—or the psychological separation of the learner from the instructor and decreased effectiveness of the transaction—increased. Or simply stated, the more efficient the dialogic exchange, the lower the perceived distance in the educational transaction, and the possibility for miscommunication is reduced.

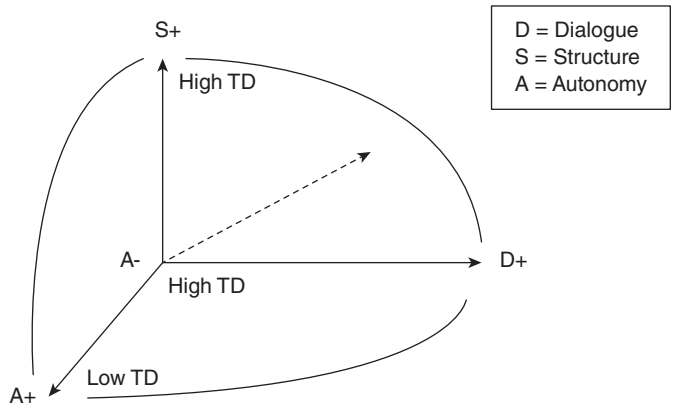


Figure 19.1 The three dimensions of transactional distance

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Also, as shown in Figure 19.1, it may be possible to have high learner autonomy and low dialogue, and still have low transactional distance based on the reduced need of the student for dialogue. This ties into the concepts of self-directed learning (SDL) and independence discussed by Garrison (2003), and Anderson (2013) in previous editions of the handbook.

Thus, the theory of transactional distance outlines three key design factors that interrelate and impact our designs for distance education courses. However, as stated earlier, the interaction of these variables plays out at the individual level, so when we are designing for a cohort experience, we have to consider an ideal case that may involve a heavy dialogic exchange, but also realize that it will ultimately be different for each learner. Further, when we think of autonomy, there is a multitude of factors that come into play: motivation, prior learning knowledge, self-regulation, and metacognition. All of these will impact the amount of learner control a student wishes to have. This particular aspect of the theory is further highlighted in the work by Saba and Shearer (1994), where they looked at a system dynamic model for transactional distance whereby the ideas of learner control and instructor control emerged as key levels in the systems model.

Community of Inquiry

The Garrison et al. (1999) model of the Community of Inquiry presents a means of analyzing and planning online learning, and presents three key factors: social presence, cognitive presence, and teaching presence. Garrison and Anderson (2003) in their first edition of the book *E-Learning in the 21st Century* depict the Community of Inquiry model as three overlapping circles of presence, with the area that is common to all three circles representing the "educational experience." Garrison (2017) in the third edition of the book continues to support the original definitions of the three presences as put forth by Garrison and Anderson (2003) in the first edition. The three variables or presences are defined as:

Cognitive Presence: The extent to which learners can construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry (p. 28). The indicators of cognitive presence are based on the practical inquiry phases of triggering event, exploration, integration, and resolution.

Social Presence: The ability of participants in a community of inquiry to project themselves socially and emotionally as 'real' people (p. 28). Short, Williams, and Christie (1976) introduced the idea of social presence in their work on the social psychology of telecommunications and looked at the impact of different media on the construct of social presence. Further, Gunawardena (1995) indicates that in the absence of face-to-face non-verbal cues such as head nodding, smiling, gesturing, etc., participants in an online learning environment make up for the lack of these observable cues by increasing "overt social-emotional expressions such as greeting, and paralinguistic cues" (Gunawardena, 1995, p. 155).

Teaching Presence: The design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes (Garrison and Anderson, 2003, p. 29). In describing teaching presence, they state "teaching presence brings all the elements of a community of inquiry together in a balanced and functional relationship congruent with the intended outcomes and the needs and capabilities of the learners" (p. 29).

When comparing the key variables of the theory of transactional distance with the constructs presented in the Community of Inquiry model, there is some apparent overlap. For example, cognitive presence is similar to the idea of dialogue and is related to the development of knowledge; however, within the CoI model, it is focused on the group interactions within an open and trusted

community of inquiry. Even within this structure, however, the creation of knowledge is still a very personal experience through reflection and dialogue with the community. The question that arises within the model is: if it assumes that individual knowledge creation is constantly shared back with the community, with the element of teaching presence providing the optimal condition for moving everyone along the knowledge construction path for the topic.

Social presence, while not a part of the theory of transactional distance, has been shown to have a major impact on dialogue as it helps create trust that is important to an open dialogic exchange. This is highlighted in studies by Swan (2002), Picciano (2002), Tu (2002), Shearer (2010), and others. Further, it is an element of online learning in distance education that is important in terms of a sense of psychological connection that may lead to increased motivation and increased satisfaction with an educational experience.

Teaching presence is unique to the CoI model compared to the theory of transactional distance, as it is about the facilitation and coordination of the other two processes that help find the balance for the overall educational experience (the overlap of the three presences). While one could argue that this type of facilitation and coordination is similar to helping a learner find the balance between dialogue, autonomy, and structure that lead to the feeling of connectedness or reduced transactional distance, this may not be accurate and requires more investigation to examine teaching presence and the elements of the theory of transactional distance. Key, as mentioned previously, is that the theory of transactional distance if very much focused on the individual and the Community of Inquiry model is focused on the interaction of a group of learners within a learning community. Thus, this makes comparison tricky. Further, it is important to remember that neither theory implies the achievement of learning outcomes. However, the variables that are highlighted in both set the stage for a successful learning experience.

Thus, the underlying theoretical frameworks of these models are critical to understanding how the variables impact our designs and how they may lead to the right balance which will provide the educational experience to allow one to reach the educational goals. However, the theory and model do not predict the attainment of learning outcomes, and how they are related or not related to increased learning outcomes needs to be studied.

Design Factors

The theory of transactional distance and the Community of Inquiry (CoI) model present an array of key design factors that instructional designers need to explore as they approach the design of a distance education course, whether online or through other delivery modalities. Primarily, they are focused on understanding the audience and what the desired outcomes are for the learners, both personally and institutionally. Whether the learner is a novice or expert in the particular field, and the overall context of the course and the goals, forms the basis of whether the learner will be able to negotiate any aspects of their learning experience. In other words: what level of autonomy does the student want, and what level of learner control will/can be allowed? What is the level of interactions/dialogue with peers and others that is required to succeed, and are there any access issues (technological or personal)? These factors and others come into play in our design decisions, and the following will highlight five key factors that instructional designers should explore in the design phase and prior to any development. These design factors will be tied back to the main variables/constructs that make up the theory of transactional distance and the CoI model.

Learner Autonomy/Learner Control

Students involved in distance education are, in general, isolated geographically from the instructor and institution, and must behave more autonomously in order to meet their learning goals and those

of the institution. The amount of control that the design of a distance education course provides these learners is critical to their successful completion. If one provides too much structure within pacing, sequencing, and timing of assessments, then the learner, with competing life demands, may be forced to drop out. If a student is provided too little structure, then the learner may feel cut off and flounder through the course. Also, the type of control referred to here is not simply the control over how one interacts with the course and the instructor, but as Garrison and Baynton (1989) argue, control is a dynamic balance between independence, power, and support. While power is a psychological dimension of the learner and involves the learner's motivation, cognitive style, emotional maturity, and attitude, support refers to the support of family, financial support, the administrative processes of the institution, and so forth. Further, within our institutional structures, what level of learner control can be negotiated with highly autonomous self-directed learners? Can each learner negotiate their learning path, outcomes, and assessment strategies, or does everyone need to follow the same path as the course may be a prerequisite to others, and it is essential that everyone must demonstrate mastery around a core set of content? Also, does the institutional structure allow for various time frames for a course depending on one's individual path (i.e., adaptive learning approaches)? In the exploration of the course design, the examination of learner autonomy and learner control is a critical starting point as it will dictate interaction strategies, ideas of social presence, and the need for the self-awareness of one's metacognitive skills.

The variables of structure and learner autonomy in the theory of transactional distance are in play when we consider learner control. If we assume that they are negatively correlated, then as learner autonomy increases, structure decreases, which correlates to a high level of learner control. Thus, as one thinks about course design, the designer needs to think about the students they are trying to serve. Are they independent adult learners who are highly autonomous, or are they more traditional-aged students? Or is the course design trying to meet multiple audiences, which is never an easy task? In Moore's (1983) work on the theory of transactional distance, he developed a table that examined the types of programs in relation to the idea of learner autonomy and dependence or independence. In the table, he looked at who determined the learning objective, who decided what material to use, and who set the assessment strategies. He also depicted a learner as being in less control of the learning environment if all three of these aspects of dependence or independence were set by the teacher or learning institution.

How learner autonomy and learner control play out with the CoI model is a bit harder to discern, as the model is heavily based on the idea of the learning community in online learning environments. Thus, if a student is highly autonomous and desires a higher level of learner control, what does that mean to the three presences? If a student wishes to negotiate their own learning path, teaching presence still remains very important, but what about cognitive presence and social presence? Although research has shown that reflective learners and introverts may make the best online learners (Battalio, 2009), there is still the need to have dialogue with others to validate your mental schemas around the new knowledge. Thus, the idea of cognitive presence remains, and to some degree the concept of social presence remains, although possibly on a reduced level between fewer students.

So while the construct of learner control may seem subtle, it is vital to reflect on the construct in terms of how one designs courses for distance education. When thinking about how courses are structured today in higher education, how many leave it up to the student to determine objectives, material, and assessment? The answer is few, which leads one to consider that even if our audience is one of highly autonomous learners, we have traditionally taken away the ability for them to act in an independent fashion. Even with the adoption of a variety of Web 2.0 tools in our designs, control and autonomy remain limited. While they allow for some flexibility in tools to use for journaling, working collaboratively on projects, or contributing content to a course, on their own they fundamentally do not provide a great deal of learner autonomy or learner control in terms of negotiating one's learning path.

Also, the question of who sets learning outcomes is a difficult one. Within coherent curricula, the designer must assure that students meet stated objectives in courses in order to perform well at the next level. Thus, it is unlikely to observe many courses wherein the student determines all the learning objectives. If a course was conceived in a manner wherein structure was very low, in terms of the setting of objectives, one would likely not even have a traditionally designed educational event, as the instructional designers would have difficulty knowing what to include or how to assess the material that will be included in the design at a later time. Further, the concept of social presence needs to be examined within learner autonomy and control. While social presence is tied closely to motivation and a sense of being there, it may be heavily related to age, gender, and cultural characteristics of the learner.

Another consideration around learner control is the selection of content. Who decides, and is all content existing in a predetermined form, or can it be co-constructed during the course by the students or between an individual student and the instructor? As with many of the design factors, this depends on context, course level, and whether learners are novice or more expert in a field of study. Technically, there now exist different paths through which content can appear and collaboration can take place. Content can be curated through open education resources, sites like Wikipedia, or through visual forms such as videos on YouTube. Further, we have a host of avenues through which students can collaborate to create content, although not in the traditional sense. Platforms like Twitter, online communities of learning around specific topics, or other non-formal platforms like xMOOCs provide access to a wealth of content. The challenge for the learner is determining the authoritative voice in the various channels of content available. Further, some content when using Web 2.0 tools appears in permanent form, as in blog reflections, while other content is less permanent if it appears in wikis or within synchronous tools, so the idea of permanency becomes a question for the learner and the instructor as they negotiate content. The ability provided by these tools and platforms shifts control as sequence and pace are not as easily defined or prescribed. However, students still need guidance and a sense of how to navigate through the course so they don't become lost in the vastness of content being presented and created.

Thus, there is a balance between structure, learner control, and autonomy that must be looked at in our designs. But what is the balance, what is self-paced and what is structured, and what are exploratory features for discovering content vs. what is necessary core content?

Personalization

The constructs of learner control, autonomy, and self-directed learning highlight the personalized nature of the theory of transactional distance and support much of the current discussion within higher education around the concepts of adaptive, mastery-based, and competency-based learning. These concepts all highlight the individual and personal paths through a learning experience. It is beyond the scope of this chapter to delve into these concepts, but they highlight the desire to move to a more individualized approach.

However, if we value the ideas of Vygotsky (1978) around the concept of socially constructed knowledge, how do we design to combine the notion of personalization with the concept of a community of learners in order to provide both in our designs? In essence, this is bringing together the key elements of both the theory of transactional distance and the Community of Inquiry model. While these constructs appear to be on opposite ends of a design spectrum, it will be important to find a way to bring them together in our designs. This will take a fundamentally different approach than what is provided today in our learning management systems and within adaptive learning platforms. Our designs and subsequent technologies will need to marry these ideas such that students can negotiate their own learning paths, but at the same time be connected to communities of learners (broadly speaking) that form a unique community of inquiry. Further, these communities will

need to be very dynamic in membership, and in how they form and stretch across time. They will also need the ability to split into sub-communities as the need dictates. This is very different from our current thinking of an online distance education course that in many ways has tried to resemble our existing classroom models. Also, as we think about personalization and the concept of adaptive, it is important to reflect on what may appear as a subtle difference—adaptive picks the path for the student, whereas in a more learner-controlled or autonomous setting, the learning path is selected by the student in negotiation with the faculty.

Design Factor: Interaction

Interaction is often thought of in terms of verbal communications between two individuals or a group; however, there are several forms of interaction—some verbal and some nonverbal. Moore (1989) has discussed interaction within distance education in terms of learner-instructor, learner-learner, and learner-content. Hillman, Willis, and Gunawardena (1994) have discussed interaction in terms of learner-interface, while Moore (1980) and Saba and Shearer (1994) have discussed interaction in terms of dialogue. In essence, all of these forms of interaction come into play during a distance education course, including interaction with the learning organization. How to accommodate and provide for these different forms of interaction is a function of the technology chosen to deliver the course to the distant student. The amount of interaction provided in a distance learning environment also contributes to the degree of isolation a student may feel, or the amount of transactional distance that exists between the learner and the instructor. Further, as online distance education has evolved, interaction/dialogue has emerged as a key element in helping students reach deeper levels of learning. This is explored by Garrison (2017), Garrison and Akyol (2013), and others through the PIM (Practical Inquiry model) framework and by Shearer, Gregg, and Joo (2015) in their design-based research study that expanded on the work of Schreck (2011). Within this body of literature, group size within discussions and projects emerges as another key element in our distance education course designs related to interaction. While deep learning and small groups may lead to higher levels of dialogue, and thus reduced transactional distance and increased social presence, research needs to be conducted in this area to determine the impact of these design strategies.

Learner-interface interaction as discussed by Hillman et al. (1994) has been explored by researchers across several modes of distance education. In the fields of computer-aided instruction (CAI) and computer-based education (CBE), a solid body of literature exists in terms of interface design and the need for a user-friendly and intuitive interface. This body of literature has dealt with navigational aspects of self-contained courses, and the ease with which an end user can navigate through the program and understand what is to be accomplished to meet the learning objectives. There also exists a newer body of literature concerning interface design for Web-based courses, and recent literature has looked at interface design for mobile applications (Koole, 2009). While interface design is extremely important for assisting the student in navigating through the course and the course requirements, and may enhance or inhibit one's feeling of control or transactional control (as discussed by Anderson [2013]), the three levels of interaction described by Moore (1989), and the newer design approaches around collaboration and small groups are perhaps more central to what we view as interaction and dialogue in a distance education course.

Learner-Content Interaction

The interaction between the learner and the content goes well beyond pure navigational and directional concerns and implies what Holmberg (1983) discusses as a guided didactic conversation. This type of conversation or interaction between the student and the content refers to the way the author writes to the student when describing the intricacies of the subject matter, the way that examples

are presented and discussed, and how the author may write to the student in the first person. For students in a traditional print-based correspondence course, this type of interaction is essential, as it is through the printed word that they hear the author's or instructor's voice. Not unlike a well-written novel where the author speaks to you through the characters and not simply at you, it is this conversational form in the distance education course where the author brings him/herself into the course and goes beyond the simple presentation of content. As Bates (1995) states:

> A text is not a neutral object; its meaning depends on the interpretation of the reader. . . . If the reader is to obtain meaning from a text, there has to be an interaction. What differentiates distance learning texts from other kinds of printed material is a deliberate attempt to structure explicitly a student's response to the material.
>
> *(p. 120)*

Even today for many distance education students, studying in an asynchronous mode, the learner-content interaction is the primary voice they hear through their studies. Even when coupled with other forms of interaction, this guided didactic conversation is the design feature that they rely on to get them through the course. It is this type of internal dialogue that is essential to helping analyze and reshape existing mental schema around a topic. This is likely a key element for reflective learners, who as Battalio (2009) discusses, tend to be most comfortable in online asynchronous learning environments.

Learner-content interaction is also seen in video and audio lectures, when well-written scripts have the presenter or instructor engaged in a conversation with the learner about the content. Here the content is not simply presented and discussed as if giving a lecture to someone, but the program script has the presenter pose questions and provide insights. As one can imagine, writing in this style, whether for print, educational television/radio, or the Web, is not something that comes easily to many. It is also in the development of these guided didactic discussions that the design team's editorial staff and production staff contribute greatly to the effort. However, if we move to a more personalized approach, these concepts around student-content interaction will need to be revisited. Content may not be pre-produced as in previous eras of distance education. Content may be chosen from open education resources (OERs) and other sources; thus, we must question what becomes of the author's voice in the content/narrative.

Learner-Learner and Learner-Instructor Interaction

Moore's other categories, learner-learner interaction and learner-instructor interaction, are likely what most of us think about when we think about today's online distance education courses, and over the years much has been written about the use of email, bulletin boards, listservs, and message boards in providing the opportunity for discussion between learners and the instructor. These categories, however, existed in many forms prior to the Internet. Interaction between the learners and the learner-instructor occurred through the postal service, by means of the telephone, by means of learning centers, and synchronously for students enrolled in two-way interactive video courses or audiographics courses. What has become key to the idea of interaction between learners and the instructor is timely interaction.

This idea of timely interaction or dialogue ties into Moore's (1980) concept of transactional distance and the Garrison et al. (1999) idea of cognitive presence in the CoI model; however, what designers and faculty must strive to understand is what counts as dialogue. Some, like Neff (1998), have argued that in the asynchronous online world, dialogue only exists if a message or posting is responded to in a timely fashion. Further, Hillman (1999) states that if a posting on a message board does not have a logical sequence of post-respond-conclude, then it is open-ended and not

dialogue. Therefore, while no one will likely argue that dialogue—whether guided didactic, synchronous, or asynchronous—is not important, one must understand what should be considered as dialogue and when it should be used. Saba and Shearer (1994) conducted a study using a prototype desktop computer video system to explore this idea. They proposed a typography of interaction categories in order to examine speech acts that occurred during a 30-minute lesson. Categories such as classroom management, passive, active, direct, and indirect emerged. Important in this study is the attempt to separate conversation and classroom management discussions from instructional dialogue. Shearer (2010) further explored the construct of dialogue in relation to transactional distance and defined dialogue in an online environment to be "an educational exchange or transaction [that] is guided by a spirit of discovery and is toward improved knowledge, insight, or sensitivity of the students" (p. 93). Key in Shearer's work, which draws heavily upon the work of Burbules (1993), is not just what dialogue is, but what is not included as dialogue. Shearer in his classification scheme of dialogue provided a framework whereby speech acts, as defined by Searle (1969), were either dialogue toward understanding, or dialogue toward conversation. A key component of the classification scheme that appears under the dialogue toward conversation category is the idea of social presence in online forums that contributes to motivation and a sense of being there for the learner.

Further, as discussed by Hirumi (2002), it is important to analyze how each required interaction or dialogic sequence will lend support to the obtainment of the stated learning outcomes. To have discussion for discussion's sake is not good instructional design. The discussions within an online distance education course must be well orchestrated to enable the learner to meet the learning outcomes, and build knowledge and insights. Further, if the discussions are not well grounded in how they contribute to the stated learning outcomes, then one runs the risk of students seeing the required discussions as busywork and not engaging in a deep dialogic exchange. Instead, they will do the minimum required, per a grading rubric, and just check it off as being completed.

Interaction is, however, as complex in distance education as it is in face-to-face learning environments (Shearer, 2003). Much of the original thinking about the introduction of the Internet into learning environments was about the democratization of interaction between people, and that the Internet was going to have a great leveling influence on all who participated. However, research (Tu, 2001) shows that the same cultural, gender, and class issues that one witnesses in face-to-face classes still exist online. Therefore, designers must know the course audience and help the author(s) understand the complexities of a diverse audience participating in the course. Further, Web 2.0 tools add complexity to the design factor of dialogue and interaction as they allow for more immediate forms of communication and dialogue, but possibly less reflection. Also, as discussed by Carr (cited in Anderson & Dron, 2011, p. 90) and others, some of today's communication channels can lead to groupthink, which can be dangerous. Not only can this lead to incorrect understanding, but it can cut out the dissenting voices as people might choose only to follow those they agree with. To better understand how these newer channels of communication fit into our designs and their impact on dialogue and transactional distance, a research agenda needs to evolve to explore the impact.

Thus, learner-learner interaction and learner-instructor interaction need to be examined not only for how it occurs, but also for the frequency of occurrence, timeliness of interactions, and in terms of the intent and form of interaction (inquiry, debate, instruction, or conversation), within the PIM framework. Designers and faculty also need to examine how to account for passive observation of course dialogue and interaction, and for cultural influences. This ongoing analysis of interactions and dialogue will assist in answering questions posed of online courses: the appropriate level of interaction to include in a course; if micro-blogs like Twitter are really dialogue, or if they are another form of interaction; and how—and if—social media networks should be integrated into online learning environments. These questions tie back to the idea of transactional distance and cognitive presence, and how dialogue toward understanding and dialogue toward conversation should be

woven into our course designs in support of social presence and how they assist students in meeting the stated learning outcomes.

Collaboration/Group Work

Collaboration and group work in many ways have become a cornerstone of online courses. Likely, this is for several reasons including: small groups allow students to get to deeper levels of learning in the course through open and trusted dialogic approaches, the ability of faculty to manage workloads in courses, or in terms of group work to simulate real-world scenarios in how projects will be approached. Whatever the design reason, group work adds a different element to our interaction design factor than just thinking about learner-content, learner-instructor, and learner-learner interactions. Further, some group work will be truly collaborative, while other groups will move in a more cooperative fashion. These elements in our designs will have all of the above interaction types but on a smaller scale per group and will require a higher level of engagement by the instructor. Also, if we think about the ideas of learner control, how do these projects play out if one can negotiate their own learning path? How can we provide greater learner control while also providing a rich environment for socially constructed knowledge at the individual and group level? This may require a variety of group activities that students can choose from, and that are aligned to certain learning paths. For example, a finance course may have projects around personal financial planning, international finance, non-profit finances, and others. These would align with a set number of paths students could choose from and students would be grouped depending on the path they choose. It is assumed that students with similar interests would be more engaged and a richer dialogue would develop in discussions around the projects. There is no doubt that in today's current LMSs, this would greatly increase the level of faculty engagement required and it would be complex to design effectively. However, would this also address some of the group dynamics experienced around group work and projects in online courses? An approach of this type calls for good design-based research studies to explore whether this leads to deeper learning and a reduction in the organizational dynamics often seen in group work (partial group involvement, some working collaboratively while others work cooperatively, etc.). Studies such as those conducted by Lee, Huh, Rice, and LaPrairie (2017) start to explore how changing the expectations in groups may provide some answers.

Design Factor: Social Presence

The concept of social presence, especially within online distance education courses, is an important factor in the design of distance education, and it is essential that it stand as its own design factor, as represented in the Community of Inquiry model. Although it can be seen as a subset of dialogue toward conversation as described by Shearer (2010), it is the sense of connectedness that social presence speech acts, written or spoken, bring to the environment that may be responsible for the reduction in transactional distance as it relates to psychological presence.

The perception of presence in a computer-mediated experience is core to a student feeling psychologically or emotionally connected with the educational event. In a broad sense, presence in a computer environment as defined by Lombard and Ditton (1997, cited in IJsselsteijn, Ridder, Freeman, & Avons, 2007, p. 2) is the feeling of "perceptual illusion of non-mediation." This idea of presence for an individual in an online environment can be achieved through visual illusion or through a social aspect where one is drawn into the environment through conversation and engagement. As referenced earlier, Short et al. (1976) introduced the idea of social presence, and they indicated that it is "the capacity to transmit information about facial expression, direction of looking, posture, dress and non-verbal cues [that] contribute to Social Presence of a communications medium" (p. 65). While their work examined which media enhanced or inhibited social presence,

as they defined it, they did recognize that social presence is as much a factor of the individual as the media, as it is "a perceptual or attitudinal dimension of the user, a 'mental set' toward the medium" (p. 65). Gunawardena's (1995) later work advanced this line of reasoning around the individual and indicates that one's perception of social presence is related more to what participants do to promote interactions and a sense of community than to the characteristics of the medium. She concludes that "even though CMC is considered to be a medium that is low in social context cues (as defined by Short et al., 1976), it can be perceived as interactive, active, interesting, and stimulating by conference participants" (p. 147). Thus, in asynchronous models of online distance education whereby we often have an absence of face-to-face non-verbal cues such as head nodding, smiling, gesturing, etc., participants in these online learning environments make up for the lack of these observable cues by increasing "overt social-emotional expressions such as greeting, and paralinguistic cues" (Gunawardena, 1995, p. 155). The work of Gunawardena (1995), Gunawardena and Zittle (1997), and Rourke, Anderson, Garrison, and Archer (1999) helped focus the construct of social presence on the relational aspect of what can occur in online learning environments and away from the media characteristics argument presented by Short et. al. (1976) in early studies on social presence.

Two key dimensions of social presence discussed in articles by Gunawardena (1995) and Gunawardena and Zittle (1997) are the constructs of intimacy and immediacy, and their relationship to social presence. As defined by Gunawardena and Zittle, intimacy "depends on factors such as physical distance, eye contact, and smiling" (p. 9), and are related to characteristics of the media and what is communicated physically; and immediacy "is a measure of the psychological distance that a communicator puts between himself or herself and the object of his/her communication" (p. 9). Immediacy in this sense is not a measure of time to respond, but the idea of comradeship or aloofness that an instructor may bring to the learning exchange (Gunawardena, 1995). Short et al. (1976), drawing upon the work of Wiener and Mehrabian in 1968, discussed that immediacy manifest itself in ways like "Let us . . . or We. . . . As opposed to I . . . or You" (p. 73). Where the first two types of utterances represent a form of closeness and the latter two represent a sense of separation.

In today's courses, the addition of video for faculty introductions, student presentations, synchronous collaboration through Blackboard Collaborate, Adobe Connect, or other Web 2.0 tools provide for an enhanced sense of presence not previously available to students in many distance education courses. This enhanced ability to be "real" in a virtual environment may provide for increased satisfaction and a perception of reduced transactional distance as it is related to psychological separation in our asynchronous courses. Whether it reduces the possibility of miscommunication, which is the other key factor in decreasing transactional distance, still needs to be explored.

Further, the idea of immediacy in social presence is closely related to the idea of psychological distance/connectedness presented in the theory of transactional distance. This construct leads credence to the postulate that it may be social presence speech acts that reduce individual psychological separation or transactional distance instead of the construct of dialogue as discussed in the previous design factor section. However, more research needs to be conducted to examine these relationships.

Social presence, however, plays out differently for each learner depending on if they are highly autonomous and reflective learners, or if they prefer more structure and are global learners as discussed by Battalio (2009). Also, Garrison and Akyol (2013) expand upon the idea of social presence by incorporating the idea of group social presence where they discuss that "social presence has been revised as the ability of participants to identify with the group or course of study, communicate purposefully in a trusting environment, and develop personal and affective relationships progressively by way of projecting their individual personalities" (p. 107). This expanded definition of social presence ties back to the earlier discussion of group work and collaboration, and further highlights the importance of social presence at the group level for successful group work. Further, as discussed by some students over the past three years in an "Instructional Design for Distance Education" course at the Pennsylvania State University, social presence also has cultural aspects and is not something that

can be forced by the instructor; it must occur naturally. Each student must decide to engage or not to engage in an overt manner. Thus, what we observe is the manifestation of social presence from an observer's perspective which may not actually indicate that a student feels connected or distant from others. Also, as referenced earlier where Tu (2001) discussed that we see the same cultural, gender, and class issues online as we do when face to face, these behaviors can also impact the sense of social presence. If a student feels bullied or disadvantaged in some way, it can impact their feeling of connectedness, and thus their overall feeling of transactional distance. Therefore, instructional designers must assure that there are multiple avenues for establishing social presence and that an instructor, as a facilitator, is engaged and helps assure students feel connected at least to them and the content.

Design Factor: Access

Making learning opportunities available to the disenfranchised has been a primary goal of distance educators and adult educators for over a century; however, access has many attributes. For example, throughout the first decade of this century, there was no shortage of articles and news stories on the technology aspect of the digital divide, but this is just one way of looking at the concept of access. Access issues in education can be viewed in terms of gender, culture, finances, geography, supply and demand, disabilities, preparedness (entrance exam qualifications), motivational (self-esteem), language, and a number of other ways. To view access strictly as a concern of geographic separation, or simply as a concern of technology access, is too limiting a view. To design distance education courses and curricula of study without acknowledging the variety of access issues that the intended audience may face can lead to the exclusion of many who may otherwise be interested in or need the course of study. Further, when we think of access and distance education today, we should not automatically assume online or digital. There are populations where Internet access via traditional landlines, satellite, or through cellular service is still limited, so we need to think more broadly about our distance education approaches.

Traditionally in distance education, we have thought of access primarily as an issue of geographic separation of the learner and the instructor. In many ways, the technologies we have employed in the delivery of courses have been used to address this concern; however, technologies such as print, radio, and TV (with closed captioning) have also addressed a range of disabilities, as well as cultural and financial issues of access. These are technologies that can reach broad audiences, are relatively inexpensive to receive, are often readily available in most countries, and can address the needs of those who have special visual or auditory needs. Today in countries across Asia and Africa, where traditional access to the Internet is limited, studies are highlighting the broad adoption of cell phones (Motlik, 2008) as a necessary means of providing access to information and education. In the Philippines and Mongolia, there has been considerable work done with the use of SMS (short message service)/ text messaging to expand access to education and informal learning (Libero, Ranga, & Lambert, 2007). The adoption of cell phones, which have a huge market presence in these countries at a low cost of entry, is expanding the reach of education in the same way as radio did in the past. However, it brings up questions of access for those with disabilities or language barriers. While some smartphones like Apple's iPhone have proven to provide access to those with visual disabilities (American Foundation for the Blind, 2017), it cannot be assumed that everyone has access to these high-end phones.

Internet and Technology Access: The United States

According to the Pew Research Center's "Pew Internet & American Life Project" report "Digital Division" (Fox, 2005) and the recent "Internet/Broadband Fact Sheet" (Pew Research Center, 2017a), American adult Internet use increased from 68% to 88% since 2005. A similar study by the

Pew Internet and American Life Project (Smith, 2010), indicated that the growth in the number of American adults with high-speed Internet access had slowed down, and the "Internet/Broadband Fact Sheet" (Pew Research Center, 2017a) report from January 2017 shows that 73% of American adults are now identified as home broadband users. Overall, the reports indicate a leveling off of high-speed Internet adoption within the United States. Further, in the 2010 report, 31% of respondents believe that the lack of broadband access is a disadvantage to learning new things, while 63% do not. Also, a report by Anderson and Perrin (2016) indicates that 13% of adults still do not use the Internet. While this is down from the 21% reported in 2010 (Smith, 2010), the percentage is still highly correlated to demographic factors including age, education level, and household income. In other "Pew Internet & American Life" reports (August 9, 2011; August 26, 2011), the data showed that 92% of American adults use the Internet primarily for email and searching, with 6 in 10 doing so daily. From 2005 to 2016, usage of social network sites has grown from 5% for adults to 69%, although this is an increase of only four percentage points since 2010 when the usage was reported at 65%. Also, usage of social media continues to be heaviest among women, young adults younger than 30, and parents. Women and young adults between 18 and 29 remain the power users with 72% and 86% of these demographic audiences using social networks, respectively. Among the social media users, 76% use Facebook and 51% use Instagram daily, according to "Social Media Fact Sheet" (Pew Research Center, 2017b). However, the data does not reflect how the uses of social networks are related to any educational purpose. Further, the "Pew Internet & American Life" report (Smith, 2017) indicates that 77% of adults now use smartphones within the United States, which has doubled between 2011 and 2016, when compared to the Pew Research Center (July 11, 2011) report, and the United States is now seeing a 95% adoption of cell phones.

Thus, over the past decade (2005–2016), there has been a narrowing of the gap between the haves and have-nots in relation to Internet access, although a significant percentage of the growth is through cellular networks, as the growth in smartphone ownership and usage has grown from 35% in 2010 to 77% in 2016/2017. However, we must be mindful that access to broadband Internet is not universal, with only 73% reporting home broadband access and 77% reporting access via cellular networks. Thus, we still have approximately 25% of our population that may need to depend on local resources like the library, high schools, or community colleges to access online courses that contain material that requires a high-speed connection to view. However, this will depend on their cell phone network and whether they have access to the newer 4G and 5G service. Also, wireless access is more prevalent than in the past, so access to traditional broadband may not be as important as it was in previous years.

Internet and Technology Access: The World View

Internationally, a report by WRI Research (Wired Digital Inc., 2000) indicated that 80% of the world population was being left out of the global communications system, and a report by the Commonwealth of Learning (2005) stated; "millions of children in commonwealth countries lack access to basic education." Recent reports from Miniwatts Marketing Group (2017) indicate that Internet penetration in Africa is still low at 31.2%, in Latin America/Caribbean it is 62.4%, and in Asia it is 46.7% (with Asia representing 55.2% of all Internet users worldwide). Compared to six years ago, when the data was pulled, Internet penetration has grown to almost double among these regions. In contrast to 2011, when many countries in Asia fell below 10% of penetration in their populations, only two countries now fall below 10%.

In regard to overall access to educational opportunities, Africa still accounts for more than 43% of the world's out-of-school children (grades 1–12), and 22% of the adults aged 65 years and older still lack basic literacy, which is one of the highest gaps between young and elders (UNESCO, 2017). In the 2015 "Education for All Global Monitoring Report" (UNESCO, 2015a), it estimated that

774 million adults worldwide still lack basic literacy. Further, there have been consistent gender differences. Since the UNESCO 2007 report, data still shows that 64% of adults lacking basic literacy are women, and gender equity issues remain high for women's access to education (UNESCO, 2017).

For designers and faculty, national and international statistics on Internet access continue to be critical to consider when undertaking the design and development of courses offered at a distance. If the institutional mission is to extend access to an international audience, then it is important to understand the technology restrictions that these audiences may face and what traditional technologies may be more appropriate to integrate into our designs. It is also important to consider the impact of a new technology. It is possible that when some technologies are integrated into distance education courses, they may actually disenfranchise a large portion of the population and/or increase the cost of education to the students. This increase in cost is not only through the need for information technology access, but is associated with the cost of developing technology-rich courses, which may drive up the fee or tuition structure for these courses.

As designers look at incorporating new and innovative technologies into their course designs, they need to examine how or if the technologies provide greater overall access to education, or if they limit it due to cost structures and technology access challenges. Further, if we add a technology, what is the pedagogical purpose? For example, is dialogue enhanced through SMS or other social networks, and what is the impact on social presence? As learning management systems add social media capacities within courses and across curricula, researchers will need to explore the impact on dialogue/cognitive presence, and on social presence and locus of control, as new tools become available.

Beyond technology access, it is also important to consider issues of access related to disabilities. The idea of universal design, or Americans With Disabilities Act (ADA) compliance, is extremely critical, especially as distance education has become more mainstream. With more nontraditional students turning to distance education to meet their educational goals, institutions continue to see an increased awareness and scrutiny by entities like the American National Federation of the Blind, which are actively exposing institutions that do not approach their course designs with an eye to disability compliance.

Design Factor: Costs

For many years, costs of designing and developing courses for distance education have been associated with high fixed costs of development and low delivery (variable) costs in order to fulfill the mission of making education opportunities broadly available to the general public. This has essentially been the rationale behind the high expenditures that distance education providers have put into the production of education television and radio broadcasts, as well as traditional print correspondence courses; however, each technology used in delivering a distance education course has its own unique cost structure.

For designers, it is important to understand the unique cost implications for each technology for both the student and the institution. As technology is added to a course, it not only drives up the costs of development, but potentially drives up the costs to the students for delivery. If one reviews the cost analysis that has been conducted at the Open University of the United Kingdom and other distance education institutions (Hülsmann, 1999), it highlights that print is the benchmark media other distance education courses were measured against. This is not surprising, as print has a relatively low cost for production per hour of study usage, and distribution of print-based courses tends to be low. Also, courses developed in this medium have a long shelf life before they are in need of revision.

Once one moves up the technology continuum, development costs are added. Changing the printed narrative of the course author(s) into audio, video, or a host of other interactive technologies increases production costs. The studies presented by Hülsmann (1999) which used a measure of

"development cost per student learning hour by medium," indicate that other technology costs are measured in terms of a ratio to print. Development for educational television is roughly 180 times that of print, CD-ROM 40 times that of print, and audio (cassette tapes) is 34 times that of print. What is important to note is that all these technology forms are canned productions meant to have long shelf lives and to be accessible by a large student population.

Class size and revisions also have a major impact on costs, and Shearer's (2004) report "The Distance Education Balance Sheet" presents a series of tables that illustrate the impact on a course's bottom line when class size is altered, or yearly revisions are required, when compared to a traditional rolling enrollment course. This analysis highlights how the mission of the institution and how an institution implements distance education can impact a unit or organization's return on investment (ROI).

The concept of long shelf life and delivery to a large student audience is what allows for economies of scale. What is unclear since the adoption of Internet technologies and the World Wide Web is whether one can design a course that will have a long shelf life and be available to a large number of students. Most distance education institutions now incorporate Internet communication technologies into their courses in order to provide a greater sense of connectedness between the learners and the instructor and institution. With the addition of these tools, it is hoped that a greater sense of community, timeliness of feedback, and a sense of social presence is provided; however, what is not clear is to what extent this limits the number of students who can enroll in a single section of a course. As designers add greater interactivity between the student and the instructor, this limits the number of students a faculty member can effectively interact with. For institutions that have moved to semester-based online distance education courses, or what Inglis (2013) has defined as the classroom model, this aspect of connectedness can be quite limiting in terms of the number of students who can take an individual section of a course; and obviously, the more individual course sections an institution needs, the greater the variable costs in terms of instructor salaries and course section setup costs. Thus, while increased interactivity is positive in terms of transactional distance, it may have negative consequences in regard to costs and scale.

Flexibility of design must also be examined in terms of impact on course shelf life and ROI. Learning management tools like Canvas, Blackboard, Desire2Learn, and others, along with open education resources (OERs), allow faculty and authors a great degree of flexibility in terms of updating and revising courses. With this flexibility and ability to make minor revisions each time the course runs, we lose a degree of shelf life that will dramatically impact the economies of scale. If an institution is constantly revising courses, then additional development costs are incurred that reduce even the positive monetary impact of a large student audience. This logic, however, assumes that a traditional relationship between the design team and the faculty author continues to exist after the initial development of the course. If, after the initial development, the task of maintaining the course and integrating changes falls to the individual faculty members, then the ROI equation changes depending on faculty pay model. In a scenario like this, the added faculty time might not be captured as an ongoing cost, and the impact of the constant tweaks and revisions will be viewed as minimal to the unit's or organization's bottom line.

With the vast array of technology tools available to instructional designers in today's highly digital and connected world, it is more difficult to achieve a long shelf life for distance education courses. The constant need to remain current with technologies makes it hard to maintain a standard course over more than a year. Further, the integration of rich media is increasing the cost of production and truly requires a design team with specialists in media production. Thus, as production costs rise for online distance education courses, scale may actually be decreasing. Also, if we move away from what many have viewed as a replication of the face-to-face learning environment, or classroom model, and to more personalized learning paths and adaptive learning, then what does the cost equation look like for our courses in terms of development and delivery? Do we further lose scale and economies? Do our fixed costs drop further, while our variable costs increase? Or do we adapt new design

strategies that move us away from our historical view of costs around distance education? We likely do not have enough data around these new approaches to our distance education courses, and it will be a while before we truly understand the costs.

Billable Hours and ROI

Understanding your costs associated with design and development is difficult and time-consuming. Only when an organization makes a concerted effort to track all the costs, and approaches each course from a cost accounting view, can one develop a picture of the overall costs associated with the design and development of a distance education course. This is also something that needs to happen across time as each course is different depending on course level, content, and objectives. So it can take the review of time tracked to courses across 2–3 years to develop a solid estimate of what is required to develop a course. Knowing hours of effort is the first step. An institution then needs to determine what its billable rates will be for each staff in each functional area, and how they will account for multimedia or other costs that may need to be outsourced for development.

An institution can approach billable hours in one of two ways. They can use a direct cost approach whereby billable rates are strictly based on salaries and fringe (benefits) associated with the staff working on the project/course, or they can use a full cost recovery approach whereby not only salaries, but all the costs associated with the design unit, are incorporated into the total annual cost of the unit. This would include their share of overhead (costs associated with administration, marketing, IT support, etc.). The billable rate is then the total annual costs (excluding direct costs to outside consultants and companies) divided by available billable hours. Available billable hours is normally a percentage of all design staff hours that accounts for a reduction in hours associated with general administration time (meetings, email, professional development) and allowable vacation and sick time. For example, if an average year provides 2,000 individual staff hours, then possibly only 65% of those hours are actually available for direct effort on the design and development of courses.

Knowing a design unit's billable hours and rates can assist designers in understanding what design features and technologies can be incorporated into a course. If an institution's billable hourly rate is low, this may provide for more latitude in our media chooses and still allow us to stay within budget. However, if one has a high billable rate, there could be limits based on the individual course budgets that are set. Further, a designer may have more latitude if the course will have a long shelf life and the costs are spread over 3–5 years.

Instructional designers also need to take into consideration the ROI goals of the institution or the distance education unit. If the model is one whereby the design team handles all initial development and revisions, and the institution is looking for a strong ROI, then they want to strive for content presentation that can be stable for 3–5 years to ensure a certain degree of shelf life. The degree of shelf life one achieves will depend on establishing a balance between the desire for continuous improvement of academic quality, the integration of new technologies, and the need for ROI. Therefore, a decision needs to be made between what content can exist in a fixed form for 3–5 years and what aspects of the course can be updated each semester or each year through other technology means such as electronic postings to the LMS discussion boards, the use of asynchronous tools like Adobe Connect, Blackboard Collaborate, or newer tools like Zoom, or integrated social media tools. The instructional designers must also weigh the impact of high levels of interaction between the students and the teacher on the ROI. The more interactive the course, the lower the number of students a faculty member can effectively communicate with. Other factors that may impact costs are associated with new government regulations for tracking and monitoring progress, and for adherence to accessibility requirements for students with visual or other disabilities.

The analysis of costs associated with delivering courses at a distance is complex, as demonstrated by Keegan (1996), who examined several formula-based approaches to the topic. There are several

factors in the cost equation, and each must be viewed systemically, as there is no simple cause-and-effect relationship. For designers, it is important to be cognizant of how decisions about distance education course design impact both development and delivery costs—which affects the bottom lines of both the students and the unit or organization.

It is important to note that the focus here has been at the course level, but there is a host of other costs associated with distance education. These include marketing, advising, counseling, help desk/student support, registration, finances, and administrative overhead. An analysis of these costs is beyond the scope of this chapter; however, designers need to be aware of these costs as decisions they make at the course level can impact costs across the spectrum of the distance education organization's budget.

Conclusion

Since the third edition of this *Handbook*, the pace of technology advancement has continued and possibly increased. As many of the new tools are versions of existing technologies, there has been a renewed focus on pedagogical approaches that have been used in previous generations of distance education. These include adaptive learning, competency-based education, and use of existing content or OERs (open education resources). What is different this time is the sophistication of the tools and underlying algorithms. There has also been an enhanced focus on artificial intelligence or what was once viewed as expert systems. Further, the field has seen a renewed interest in immersive learning with the introduction of virtual reality, augmented reality, and mixed reality. All of these present new options for how we look at the design of distance education learning environments, but the key factors that are highlighted in this chapter remain salient, especially our underlying theoretical frameworks. This is not to say that we should not continue to examine the theories and consider if they continue to stand up under possible new design approaches, and examine possible modifications of the theories, but as designers, we should not ignore the theoretical frameworks. Also, while these new technologies may alter how we think of learner control, interactions, and social presence, these key design factors remain primary to our thinking around the design and development of distance education courses.

Instructional designers of distance education courses and programs must make a series of conscious choices each time they design and develop a course to be delivered to distant students. In some cases, the decisions are made for pedagogical reasons; at other times, the decisions are made for access reasons; and yet at other times, the design decisions are based on costs. Each time a designer decides to use a particular technology or combination of technologies, they need to be very clear on why the chosen technology is being used, and for what purpose. Knowing and understanding the strengths of each technology, whether the latest virtual reality tool or an old faithful such as print, is critical to defending and implementing our design decisions. It is critical that designers, faculty, and institutions take a systems view of how the technologies chosen impact all the components of a distance education delivery system.

In the development of distance education courses, it is important to remember that there is no one best technology, and it is usually a combination of technologies that produces the best course to assist the student in meeting the educational objectives. Also, delivery and production costs must be in the forefront of instructional design decisions, for if as designers, the design decisions are driven by the goal of reduced delivery costs to an international audience, then one may decide to provide the content so it can be viewed on mobile devices by means of a downloadable PDF (portable document format) file, or a short video podcast. It is also important to understand when technology adoption adds value or simply passes a cost onto the students.

It is essential, therefore, that designers of instructional material for distance education courses understand the strengths and weaknesses of a vast array of technologies and how the older technologies

have been deployed in the past to address the multitude of design factors, and how their decisions are supported by the literature and underlying theories and distance education models. How and why we integrate certain technologies and pedagogical approaches into our designs is the key to the success of our distance education students, courses, and institutions.

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ACTIVE LEARNING STRATEGIES FOR OPTIMAL LEARNING

Rebecca Heiser and Penny Ralston-Berg

Evidence supports that designing courses with the focus on the learner's process embedded with active engagement in thinking, problem solving, information analysis, and reflection provides meaningful and optimal learning in the online environment. This chapter focuses on active learning strategies within an online delivery mode. Additionally, the chapter will refer to content experts, course educators, faculty, instructors, and course authors as subject matter experts (SME). The term *course designer* is used to describe an educator, learning designer, or instructional designer who may design, create, consult, strategize, and/or implement a course for online and distance education.

Distance Education Affordances

Recent studies beginning in 1996 conducted by the U.S. Department of Education and other academic entities report that online learning is proportionate to traditional face-to-face learning (Kauffman, 2015). By affording learners with the flexibility to complete learning tasks on their own time, "the U.S. Department of Education (2010) found that in some cases, students in online learning environments met learning outcomes and performed modestly better than counterparts studying the same material in traditional face-to-face courses" (Riggs, in press, p. v). Overall, distance education is equivalent to, and in some cases better than, traditional face-to-face instruction (Siemens, Gasevic, & Dawson, 2015). Other than flexibility, what affordances might online distance education courses have that their equivalent face-to-face courses do not?

With a focus on course design, Riggs contends that online courses may be better suited to active learning in that they afford more integrated content delivery, better use of multimedia, more integrated Internet-based information, more time on task for learners, a more learner-centered experience, more time to perform meaningful actions, and more easily managed reflection on those actions (in press). Online distance education also affords learners from all backgrounds with learning experiences through inclusion and universal design principles. An additional affordance is the utilization of open educational resources (OER), or the free use of high-quality, digitized materials and improved access of educational resources in online distance education (Hockings, Brett, & Terentjevs, 2012).

These affordances are not achieved by merely placing face-to-face content online. Variables such as course design, instructor performance, and student characteristics can all impact the quality of individual online courses (Hixon, Barczyk, Ralston-Berg, & Buckenmeyer, 2016). Successful online course design starts from a solid foundation of alignment, communicates clear expectations to learners, and is informed by learner needs. These core design elements apply to all subject matter,

strategies, and desired outcomes. Active learning strategies can then be layered onto this foundation to optimize learning for online distance education.

Foundations for Design

Alignment

Instructional design in online distance education is an iterative and systematic process of problem solving to align learning theories, learner expectations, teaching pedagogy, educational technology, and user experience design with curriculum and course outcomes. Reeves states: "The success of any online learning environment is determined by the degree to which there is adequate alignment among eight critical factors: 1) goals, 2) content, 3) instructional design, 4) learner tasks, 5) instructor roles, 6) student roles, 7) technological affordances, and 8) assessment." (Reeves, 2006, p. 294). The alignment of all course design components is critical to achieving intended instructional and learning outcomes.

Central to the design of an online course, are learning objectives. They serve as the cornerstone of instructional alignment, drive course content to active learning strategies, and direct, deliberate assessment methods with timely feedback. Contingent on the academic discipline, learning objectives should support conceptual or procedural knowledge to develop learners within their domain. In any course design, learning objectives should be scaled from foundational knowledge to higher-order cognitive thinking. Also, learning objectives are a crucial factor to support student performance and satisfaction in online learning environments (Kauffman, 2015).

Assessments build on clearly defined objectives to measure learner performance. The success of course design is contingent on the alignment of learning objectives supported with high-quality content, to assessment strategies. Reeves defines assessment as "the activity of measuring student learning and other human characteristics such as aptitude whereas evaluation is focused on judging the effectiveness and worth of educational programmes, practices, and products" (2006, p. 305). Alignment of learning objectives to assessment activities and course design is a key component of the Quality Matters Rubric, which course designers and educators may refer to as a course quality evaluation tool (Bento & White, 2010). High-quality course assessment strategies are essential to test the effectiveness of learning objectives, and are often the most innovative practice to instructional design.

Expectations

Another foundation of successful course design is clarity of expectations. According to Gagne's Conditions of Learning (1965), there are nine instructional events—gaining attention, informing learners of objectives, stimulating recall of prior learning, presenting stimulus material, providing learning guidance, eliciting performance, providing feedback, assessing performance, and enhancing retention and transfer—all of which are categorized by sequential levels of complexity to guide instructional design. Gagne's learning theories are reinforced by numerous studies focused on online student satisfaction and distance learning perspectives, including the affordances to operationalize his theories into effective and systematic instructional design practice. Online learning designs should incorporate opportunities for instructors to communicate clear expectations to learners for successful course completion (Shea et al., 2001).

Student satisfaction assesses the quality of education by analyzing the comparison of expectations and experience (Koper, 2015). High levels of student satisfaction and learning are directly related to timely, high-quality, and clear interactions conveyed by faculty, classmates, the online learning environment, instructional design, technology and course content. Alternatively, increased levels of anxiety, confusion, and isolation may be experienced if these design components are insufficient or

lacking (Shea et al., 2001). In a study of online student retention rates, learners report that their non-success in an online course is due to the perception of falling behind and feeling unable to catch up with coursework. Also, non-successful online learners reported that they lacked clear expectations on how to succeed and the skills necessary to balance course time commitment with personal obligations and organizational management (Fetzner, 2013).

It is imperative that course designs set clear expectations on how learners can be successful and achieve desired outcomes. In order to support setting clear expectations, course designs can utilize rubrics in assessment activities, articulate precise assessment instructions, include high-quality course materials and content, offer informal student-centric collaborative spaces to support the formation of an online community, and provide timely feedback with structured communication.

Informed Design

Learner Characteristics

The interplay of work and learning has deepened, as more American learners are shifting their focus to formal lifelong learning opportunities and continuous skill improvement to remain competitive in the labor market. This has created a shift in the demographics of today's learners to the following: an increase in learners over the age of 30, a new majority of learners who are also working, a rise in learners who are working more than 30 hours a week, and learners who are selecting jobs and programs of study that are interrelated (Carnevale, Smith, Melton, & Price, 2015). In addition, online learners who are considered academically successful tend to be highly motivated and have above-average communication, technical and organizational management skills (Kauffman, 2015). Written communication skills are especially critical due to the nature of asynchronous online learning environments, instruction and assessment designs. Many prospective adult learners choose to enroll in online distance education programs to meet timing and location preferences. These preferences support the shift in learners who are also working more than 30 hours a week and managing personal affairs.

Online learners may have commonalities, but also have variations in needs, expectations and online experience—and these characteristics may change over time. A recent study found that students who have taken seven or more online courses "recognize the importance of online courses having clear expectations, alignment of instructional components, logical navigation, and ready availability of required tools and resources" more than their less experienced counterparts (Hixon et al., 2016, p. 34). Based on the degree level, academic discipline, and hours of course completion, learner preferences differ on social engagement, relevance to professional goals/needs, and degree of teaching and learning (Koper, 2015). However, there is a disconnect between designing courses to support the evolution of the characteristics of the online learner. Due to design constraints (i.e., time, money), learning objectives may be created without thoughtful consideration of learners needs and expectations.

By focusing on both the who and the what of the learner population in an iterative design process, educators and course designers can meet the learner's needs and expectations and create a more effective learner-centered design (Stefaniak & Baaki, 2013). Naidu notes, "In most educational settings, very little attention is paid to analyzing and understanding learners in their learning context before any learning and teaching occurs" (Naidu, 2013, p. 269). There are numerous strategies to customize instruction and learning to meet the needs of a diverse learner population. One strategy is employing a needs assessment to utilize prior to the course development process and before designing instruction, to understand the learning gaps and expectations of learners. Another strategy is adopting a design thinking methodology by creating data-driven personas and empathetically designing the learner experience specifically for the online course environment and context.

Personas can serve as archetype-learners and go beyond demographics and a fictional narrative, to customize instruction and learning events to meet the unique needs of the learner population (Stefaniak & Baaki, 2013).

Though there are challenges to support online learners needs, instructional design has an opportunity to leverage learning design strategies to support student performance, satisfaction and success. Implications for course design include providing course onboarding activities including a course orientation, offering technical and help desk support, instructional strategies, faculty development, and essential resources of soft skills necessary to succeed (Fetzner, 2013).

Inclusive Design

As online distance education becomes more global, it is pertinent that course design meets the needs and expectations of all learners and is tolerant of diverse educational and cultural values (Liu, Liu, Lee, & Magjuka, 2010). The instructional design process needs to be cognizant of learners with a diverse set of experiences, skills, knowledge, cultural norms, accessibility to resources, and potential disabilities. The course and curriculum design should meet the needs and expectations of the student audience and offer flexible learning opportunities. Online learning environments can challenge the presence of race and gender bias in course discussion spaces (Baker, Dee, Evans, & John, 2018). Therefore, online distance education learning designs should offer equitable instruction and learning. Further, the instructional design process should be aware of cultural differences in course design elements and offer flexible learning components including language support, communication technologies, plagiarism policies, allowance for time zone differences, and diverse course materials to balance teaching and learning for international students (Liu et al., 2010). Not only does online distance education offer a platform to connect learners with diverse cultures, but it also reduces barriers for learners with disabilities. However, online distance education technologies and systems are challenged to provide real-time, inclusive translators for learners with visual, hearing, speech, language, learning, and mobile disabilities (Schwartz, 2004). The implications for practice suggest that online distance education courses and instructors should set clear expectations, offer safe learning spaces and encourage healthy discourse, acknowledge diversity and unique learner experiences, allow learners to share and communicate with their peers and instructor in various formats, engage learners to develop relationships with their peers for constructive collaboration, be aware of power issues and dominant culture dynamics, provide context to cultural references, give timely and personalized feedback, and administer needs assessments and surveys to analyze areas for improvement (Uzuner, 2009).

Focus on Active Learning

Building on the foundational elements, course designers must determine the most appropriate instructional strategies to achieve desired outcomes while meeting learner needs. Instructional strategy is defined as "a teaching strategy that includes how the instruction is delivered (the physical delivery: lecture, correspondence, television, computer, etc.). It also includes the means by which the instructor communicates in the classroom, such as active, passive, questioning, etc." (Simonson & Schlosser, 2009, p. 158). As previously discussed, the online delivery mode affords a more active and reflective learner-centered experience. Bonwell & Eison define active learning as "students doing things and thinking about what they are doing" (1991, p. 3). In practice, active learning can take many forms ranging from simple, such as a brief unstructured reflection, to a complex structured group task that unfolds over a period of time (Bonwell & Sutherland, 1996). Regardless of the learning tasks or their complexity, active learning has two basic components: action and reflection.

Traditional course design is focused on teacher-centric models in which an instructor presents in a lecture format, utilizes a textbook or other static artifacts, and works through a structured assessment plan. Moving beyond this traditional design, online distance education instructional designs afford the opportunity to leverage innovative, iterative, transformative, and student-centric designs. Assessment design for active learning strategies requires the instructor not only to appraise the student's course artifacts but also to review the student's knowledge transformation process utilized to complete those artifacts to meet successful learning outcomes. By enabling learners and putting them in the center of the learning process, instructors can employ problem-solving learning strategies to encourage meaningful learning (Michael, 2006). Active learning strategies encourage critical thinking and reflection by requiring students to consider the learning experience within and across contexts, then articulate it in a meaningful way.

Active learning creates a shift from teacher-centered instruction to student-centered instruction, and requires a conducive learning environment to support active learning strategies. Online distance education is apt to provide this learning environment, including discussion spaces for collaborative and cooperative learning to promote reflective and critical thinking skills rather than a traditional, instructor-led lecture (Prince, 2004). Further, asynchronous discussion forums promote student interaction and establish knowledge and understanding through various forms of active learning and instructional strategies, including the use of debates or open-ended discussion questions. Purposeful reflection assessments require the learner to be active in their knowledge transformation and to apply their personal experiences, beliefs, values, and practices within their discipline (Ryan, 2012). Utilizing these types of instructional strategies affords students more time to reflect and respond to each other's discussion forum posts, encourages critical thinking skills, and promotes learners to articulate their rationale, experiences, and perspectives (Richardson & Ice, 2010).

Adaptive and Personalized Learning

Personalized learning is a process, not a product. Technologies can enhance personalized learning, but are not necessary if active-learning strategies are embedded within the course design. These strategies include: interactive class discussions, instructors taking on the role of learning coach or guide, adopting competency-based learning principles, creating social components to develop purposeful relationships, and offering self-paced learning in asynchronous online environments.

Active learning strategies can exist within more complex personalized or adaptive learning systems. Analytics gathered during the learning process impact the learning system in real time, leading to a data-driven, personalized experience for the learner. Gibbons (2014) describes this as the data management and media-logic layers in which course designers must determine what data is collected, how it is used, and how it influences the overall instructional conversation between the course and the learner. Through design-based practice, online courses can assist in personalized learning principles by focusing on the learning gaps that fail to create meaningful experiences, by developing an active-learning course framework, by selecting vetted technologies to support communication and delivery, by offering faculty development and technical support, and by designing in an iterative process to re-evaluate individual-student learning gaps (Feldstein & Hill, 2016).

Active Learning Strategies

The subsequently listed active learning strategies support learner needs and expectations, offer meaningful and relevant experiences applicable to professional practice across a multitude of disciplines and contexts, align to course design and outcomes, and enhance student performance and satisfaction in online distance education (Figure 20.1). Problem-based learning is a subset of active learning.

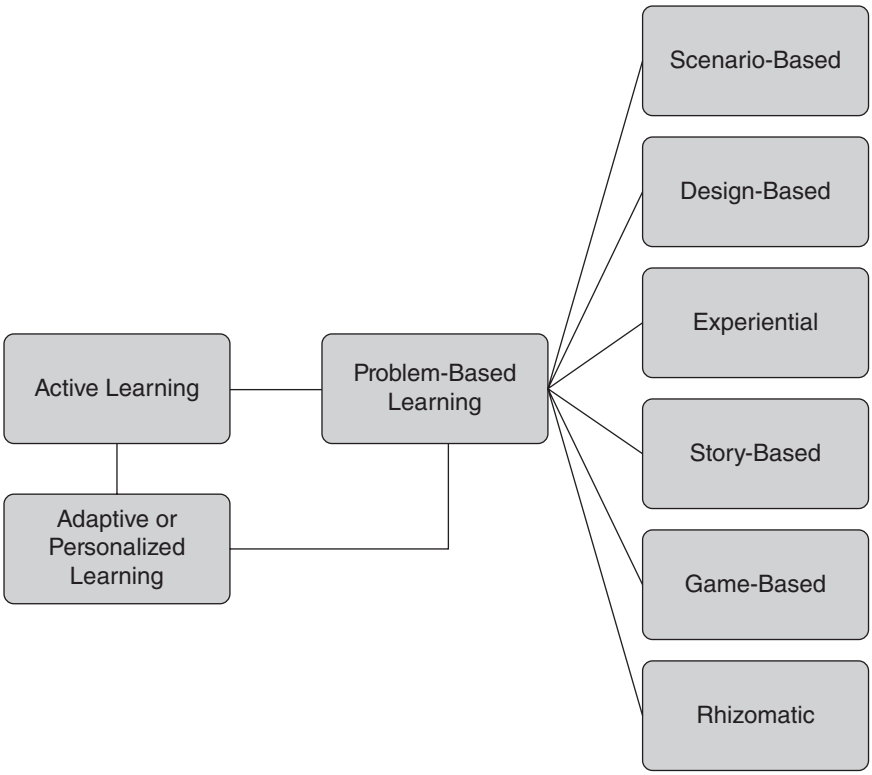


Figure 20.1 Relationship of instructional strategies

While engaging in problem-based learning, students must act, think critically, and reflect on finding solutions. Within problem-based learning, learners may be presented with varying contexts, types of problems, starting points or frameworks from which to work. Attention to instructional alignment, clarity of expectations and meeting learner needs guides the course designer's choice of the most appropriate strategy.

A course design may also contain a combination of strategies. For example, game-based learning is a broad category that often includes scenarios and character-based or plot-based stories in which learners must actively participate to reach a solution. Implementations of these strategies may also vary in fidelity and complexity. Learning experiences can range from a group problem-solving task performed through a discussion board, to an individually experienced text-based decision-making simulation, to an entirely authentic simulated environment where students interact as part of a virtual team.

Problem-Based Learning

Prince describes problem-based learning as "an instructional method where relevant problems are introduced at the beginning of the instructional cycle and used to provide the context and motivation for the learning that follows." (Prince, 2004, p. 223) Problem solving may be considered the root or may act as a catalyst for all other learning strategies, because it challenges learners to utilize and advance to high-order cognitive learning skills within a specific domain and context. Jonassen explains, "The problem-solving process depends upon the problem solver's understanding

and representation of the type problem, including an understanding of the problem state and goal state" (Jonassen, 1997, p. 66). Course designers may design instruction to engage learners through well-structured or ill-structured problem types. Well-structured problems guide learners through a process to a presumed solution by utilizing prescribed content and applications presented within the domain, whereas, ill-structured problems are unconstrained and challenge the learner to work across disciplines and contexts to determine and advocate for an unprescribed solution (Jonassen, 1997). In a problem-based learning environment, course designers may consider utilizing case-based stories to support instruction and problem solving. Online learning environments can embed instructional demonstrations, simulations, and case-based stories to provide relevancy and offer real-life experiences for learners. Instinctively, humans interpret case-based stories and examples as surrogate personal experiences (Jonassen & Hernandez-Serrano, 2002). Complex, case-based stories motivate and engage learners with real-world scenarios and problem-solving activities. Integrating stories into instruction can present learners with meaningful experiences as models, recommendations, and solutions in problem-based learning environments. Further, scaffolding the complexity of problems through a cyclical, sequential process, and adjusting the types of tasks help learners evolve their problem-solving skills and abilities (Choi & Lee, 2009). Choi and Lee state, "Successful problem solvers deal with problems while accommodating multiple stakeholders' perspectives, integrating sound theories and principles, and examining taken-for-granted practices and ideas" (Choi & Lee, 2009, p. 122).

Scenario-Based Learning

Scenario-based learning strategies challenge the learner to complete a goal or task by applying both skills and knowledge in a simulated, unstructured and authentic problem (Naidu, Oliver, & Koronios, 1999). The online learning environment offers learners to gain skills and knowledge before applying to real-world practice while being immersed in a non-threatening, low-stakes environment. Learners are situated in an interactive environment and given complex scenarios enhanced with evidenced-based literature to answer open- and close-ended questions to promote critical thinking with immediate feedback to their activity (Naser-ud-Din, 2015). Naidu et al. describes, "learning is most efficient and effective when it is situated in realistic settings where learners are clear, not only about the reasons for learning but the context or the ecology of their learning environment" (Naidu et al., 1999, p. 3). Case studies in scenario-based learning suggest positive student perception and engagement in scenario-based learning simulations and instructional strategies. For example, Agostinho, Meek, and Herrington (2005) describe an authentic online scenario in which educational technology students enrolled in an evaluation course played the roles of employees of a fictitious consultancy company. The students completed consulting and research tasks based on the needs of a fictitious client while the course instructor played the role of a hired advisor to inform student action. They also report that in order to be engaging and authentic, the scenario-based method requires extensive design work.

Experiential Learning

Through a cyclical process of reflection, experiential learning asks learners to contemplate the learning activity, whether created by the instructor or from previous experience, and analyze improved strategies for future iterations. Experienced-based learning theory suggests that learning is "the process by which knowledge is created through the transformation of experience, knowledge results from the combination of grasping and transforming experience" (Kolb, 1984, p. 41). Through a cognitive neuroscience lens and the foundations of Kolb's work, the co-constructive developmental teaching theory (CDTT) outlines a framework for teaching and learning to holistically and

systematically facilitate learner reflection in multiple states within context through an iterative process (Schenck & Cruickshank, 2015). Schenck and Cruickshank explain, "To address the myriad of variables, CDTT frames the learning even using an explicit psychological goal, cognizant of the learner's needs, and systems of attention, motivation, appraisal/affect" (p. 85). Online distance education can support reflective learning activities and enable learners to focus on the learning process (Easterby-Smith & Cunliffe, 2017). High fidelity social virtual reality (VR) can increase the ability of online course providers to provide learners with authentic experiences at a distance. For example, Le, Pedro, and Park (2015) describe a social VR experience for safety education in which learners role play to experience reality-based situations in an online virtual environment. Lower fidelity online technologies like discussion forums, journals, and blogs facilitate experiential learning because of their asynchronous and social nature by providing timely and constructive feedback.

Story-Based Learning

Due to the rapid evolution of technology, multimedia and interactive elements offer advanced solutions for story-based learning experiences in online learning environments. Story-based learning immerses the learner in a multimodal designed story to enable the learner to process the highly sophisticated information in a creative, effective, and aesthetically pleasing approach (Kose, Koc, & Yucesoy, 2013). The story-based learning instructional strategy enhances student engagement through emotion, relevancy to the context of the activity, reflection to personal experiences, and authentic application. Paulus, Horvitz, and Shi (2006) recommend that, "Designers should indeed write narratives that are credible and relevant to the learner population, with discussion prompts that explicitly encourage emotional responses, reflection, and critical analysis of the events" (p. 380). Developing a storyline can be challenging; however, most interactive narratives can be categorized by two design approaches, character-based or plot-based. Character-based systems are focused on the interactions of dynamic characters, whereas plot-based systems require a catalyst to adapt to sequential and coherent plots (Rowe, Shores, Mott, & Lester, 2010). In addition to supporting the cognitive load, designing an authentic story-based learning experience enables students to exercise neuroscience memory structures to develop an equivalent personal memory and remain engaged in the learning process. Stories can be presented to learners in varying levels of fidelity ranging from text to video to immersive virtual environments. Educators in Australia used audio character-based stories to better prepare health professionals for the roles, responsibilities, and practice they would experience in clinical workplace-based training (Paliadelis et al., 2015). Asynchronous discussion spaces and activities provide students with additional time to reflect on the narrative and to share their personal experiences and perspectives with their classmates (Paulus et al., 2006).

Game-Based Learning

At the interplay and advancements of instructional theories, learning theories and instructional technologies, game-based learning has emerged as a strategy to present creative and innovative solutions to 21st century education and training. Game-based learning is most effective when it provides immediate feedback and administers assessment during the learning process (Ifenthaler, Eseryel, & Ge, 2012). Incorporating games as an instructional strategy in an online distance education course can help learners identify learning goals, build mastery, increase motivation, personalize learning, and track task completion. Game-based learning strategies motivate learners to play and to gain knowledge, skills and improved performance simultaneously (Loh, Sheng, & Ifenthaler, 2015). Game-based learning has theoretical frameworks concentrated in behaviorism, cognitivism, humanism, and constructivism. However, most research does not explicitly address the relationship of game-based learning to learning theories. Of the studies that do, the majority situate game-based learning to

constructivism, followed by humanism, cognitivism, and then behaviorism. The relationship of constructivism to game-based learning, to emerging technologies, may be interrelated to the increase of online distance education, educational movements, and trends, and the rapid evolution of technology (Wu, Hsiao, Wu, Lin, & Huang, 2012). Games vary in complexity and fidelity. Examples of game-based learning from nursing curriculum include low-fidelity vocabulary or anatomy games which level up to promote intrinsic motivation, build mastery, and add excitement to rote memorization tasks; medium-fidelity games in which learners interact with simulated characters to practice decision making in context; and elaborate, high-fidelity multi-player simulations in immersive virtual environments in which learners practice strategic thinking skills under stress with time constraints (Bauman & Ralston-Berg, 2015; Ralston-Berg & Lara, 2012). Serious games are positioned to not only engage and motivate learning, but also to provide valuable learning analytics to crucial stakeholders (Loh et al., 2015).

Design-Based Learning

The design-based learning strategy personalizes learning by actively supporting students through a self-directed, authentic problem-solving process and by scaffolding applied knowledge to design original artifacts for project-based assignments (Feng et al., 2017). Design-based learning places students in the center of an iterative learning process and challenges higher-order skills to work through design constraints and offer solutions to open-ended problems. The instructor serves as a facilitator and guides students through competency by modeling design thinking, provoking inquiry, supporting reflection and scaffolding learning design. A substantial component of design-based learning is the social aspect of the learning process. The design tasks are often structured in a collaborative setting and learners work together, as a community of practice, to brainstorm ideas and design solutions (Gómez Puente, van Eijck, & Jochems, 2013). For example, Biasutti & EL-Deghaidy (2015) describe a project within teacher education programs at two universities in Italy and Egypt in which small teams of three to four learners worked together using a collaborative wiki writing space to propose, discuss, design, and peer review an interdisciplinary project for a primary school class. Learners were guided through the process with strategically provided readings about interdisciplinary curriculum planning and discussion of its value, implementation methods, and methods for collaboration among disciplines.

Rhizomatic Learning

Rhizomatic learning affords learners to negotiate knowledge within in a community's given context through a fluid, real-time process with fluctuating goals and shifting expectations (Cormier, 2008). Bissola, Imperatori, and Biffi (2016) describe rhizomatic learning as:

> the learning process in the rhizomatic perspective develops step-by-step in a continuously evolving path to pursue the learning objective while avoiding the obstacles it encounters. The rhizome connects each point to other points and is collective in nature, even if the emphasis remains on the movement.
>
> *(p. 207)*

There are five elements to the rhizomatic learning strategy framework: transdisciplinary and heterogeneity, open teams, emergent education, external place, and playful or challenging schemes (Bissola et al., 2016). Rhizomatic learning strategies can be leveraged through Web-based technologies to create a "digital habitat" for a community of learners (or practice) to share and produce knowledge through self-designed activities with a map of possibilities. The instructional and learning strategy

challenges learners and instructors to be literate in the technologies utilized in the digital habitat, to be aware of the affordances of rhizomatic pedagogy, to understand their role in the rhizomatic learning process, and to accept learning outcomes (Kjaergaard & Sorensen, 2014). As the rhizomatic learning community constructs its knowledge, community members validate their work with an external expert or curriculum and share their knowledge with the more extensive network of learners or practitioners (Cormier, 2008).

Technologies

Technology is advancing faster than educators and online course designers can strategically implement it into high-quality online course designs. The appropriateness of a tool depends on its support of the alignment of learning objectives to assessment strategies, the context in which it is used in the course, and the quality of the user experience design. In the course design process, course designers assess the most appropriate tool or technology to leverage the assessment, pedagogy, communication, and content while remaining inclusive to the learner population. However, many educational technologies are not initially designed with inclusive interfaces due to cost barriers and oversight, although advancements are being made for inclusive interfaces and universal design. In many cases, online learning and distance education are not the primary markets or functions for most technology vendors, products, systems, and platforms (Schwartz, 2004).

However, online learning and distance education is contingent on emerging technologies and system infrastructures that can support communication and enhance learning. Beginning in the 1990s, higher education increased adoption of technology equipment and infrastructure to support teaching and learning. Based on the critical literature review, the majority of technologies used to support teaching were to supplement existing teaching practices such as adding course materials and content in an online space. The majority of technologies used to support learning were used to emphasize operational improvement, quantitative improvement in assessment or engagement, and qualitative changes for more in-depth understanding. Therefore, educators and researchers should share their experiences, findings, and best practices to adopt and implement learning technologies within their professional communities, in order to advance and streamline effective applications to enhance teaching and learning with technology (Kirkwood & Price, 2014).

Course designers need to make thoughtful, scalable, and deliberate recommendations to align learning outcomes with active learning strategies, underpin decisions with learning theories and pedagogy, and support learners needs and accessibility when approaching and scaling appropriate technology use.

Course designers need to work within the guidelines and protocols of their institutions when adopting and implementing technology. Many institutions and organizations have an enterprise architecture in place to enable designers to make strategic decisions and embed secure technologies into course design. Enterprise solutions afford learners and educators with the technical support, quality assurance, and training necessary to apply within their context.

Course designers need to make equitable decisions to apply technologies to optimize learning. Learning technologies offer advantages in online distance education, including, multimodal media enrichment, social interaction, and asynchronous functionality to ensure perpetual access to course content and communication (Bates, 2008). Bates suggests, "Course design then will also need to be more flexible, allowing alternative routes and alternative approaches to learning to suit the different needs of individual instructors and individual learners" (Bates, 2008, p. 233). The relationship between technology and distance education is complex, but instructional design can offer reflective insights and appropriate use cases for technologies in online learning and instruction.

Design and Development

Collaboration

The instructional designer and subject matter expert (SME) share a dynamic and unique partnership due to their diverse professional backgrounds. However, they collaborate with one another in meaningful conversations and exchanges to establish high-quality course and lesson objectives. Instructional designers and SMEs share a similar landscape and context; both are educators, but often work in separate domains (Acevedo, 2014). The recognition of the expertise of both is key to successful collaboration. Flattening the power relationship through recognition of expertise by all team members and developing a shared language helps facilitate more collaboration between designers and SMEs (Aleckson & Ralston-Berg, 2011). Instructional designers work with SMEs to elicit the expert tacit knowledge necessary to design and construct active learning experiences (Aleckson & Ralston-Berg, 2011).

Iterative Design Process

It is important to remember that course designs evolve. Course designers often utilize an iterative process to improve and enhance courses. Aleckson and Ralston-Berg (2011) recommend that a formal formative evaluation plan which repeatedly interprets and integrates user feedback is more likely to achieve educational goals. Such a plan may include paper mockups, rapid prototypes, expert review, and user testing. Formative evaluation is applied to the course as whole, or to individual active learning sequences within the course. Findings are then used to inform revisions and enhancements.

Constraints

In most cases, course designers need to remain efficient and resourceful as they design courses within a strict timeline and budget (Stefaniak & Baaki, 2013), they should utilize constraints in time, cultural barriers, and resources to drive design through contemporary models, methodologies, and strategies to reach the desired outcome. In a recent case study, the design team applied the Constructivist ID Layers of Negotiation model, a rapid prototyping methodology, and design-based research to support their time and to address cultural barriers (Tracey & Unger, 2012). Course designers and design teams should adopt a perspective that course constraints are a vehicle for creativity and innovation. Tracey and Baaki advocate that "Design involves dealing with uncertainties and designers must not only learn to deal with uncertainty but embrace and use uncertainty as a tool to propel optimal design solutions" (Tracey & Baaki, 2014, p. 11). By focusing on learning objectives and working within the constraints of cost, level of complexity and time, designers determine the most effective learning strategies for the audience and desired learning outcomes (Aleckson & Ralston-Berg, 2011).

Mapping Out Complexity

The interplay of technology and instructional design continues to evolve through the affordances of the Internet, improved integrated technical functionalities, ease of access, and innovative design. Course designers are in the position to consult SMEs and course instructors on the advantages and disadvantages of media and technology for teaching and learning. In addition, course designers can create effective and pedagogically sound instruction with the enhancement of technologies and media aligned with the context of the course objectives to meet the needs and comfort levels of the

instructor and learners. Online distance education course designers need to balance the exchange of educational theory with pragmatic decisions including costs, technical support, accessibility, access, functionality, and quality assurance standards. (Bates, 2008).

In 1996, Bonwell and Sutherland suggested that faculty use self-reflection and an active learning framework as a method for choosing and incorporating active learning strategies into their classroom courses (p. 3–4). In the current day, when considering the change from passive to active learning while at the same time designing for online course delivery, a more collaborative approach is necessary. The combination of alignment, clear expectations, allowance for diverse learner audiences, active learning strategies, adaptive or personalized learning systems, advanced multimedia, technology, and the online course design process requires expertise in many different aspects of teaching and learning.

Conclusion

Online distance education instructional designs provide the opportunity to push the parameters of innovation through emerging technologies, iterative design processes, and student-centered learning. Essential to the course development process, course designers are situated to apply active learning strategies with aligned assessment and embedded technologies to meet expectations and optimize learning for a diverse student population. By using an iterative design process, course designers can leverage active learning strategies to support meaningful, relevant, and engaging learning experiences within the course environment.

Course designers are an integral part of creating successful online distance education learning experiences. They are well positioned to make complex decisions in response to ill-structured problems and optimize distance education learning. In an iterative design process, course designers layer active learning strategies on a structurally sound foundation of aligned learning objectives to assess and tailor instruction with informed design approaches to articulate clear expectations. Online distance education design expertise is a skill and practice committed to the evolution of solving abstract challenges within an ever-changing technology landscape. In this complicated environment, course designers partner with SMEs to develop a common language to collaborate and conquer technical elements, content goals, learner needs and expectations, and creative enhancements within their respective domains. Therefore, the course designer's toolkit continues to expand through the mode of inquiry, analysis, and reflection.

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21

IS TECHNOLOGY ENABLING OR DISABLING FOR DIVERSE LEARNERS STUDYING ONLINE?

Shelley Kinash, James Birt, and Madelaine-Marie Judd

Introduction

Globally, the university learning experience has radically transformed between only two generations of students (Adams Becker et al., 2017; Garrison & Anderson, 2003; Garrison, Anderson, & Archer, 2000; Kinash, 2017). Grandparents of today's university students spent most of their time in tiered theater seats listening to lectures. A high proportion of today's students are enrolled in online campuses and even those who are formally registered as on-campus students mostly engage online through learning management systems (LMS) that accompany their lectures and labs. Many campuses now resemble ghost towns, as after the first few classes, a high proportion of on-campus students figure out that they can learn at home in their pajamas or at a local coffee shop with friends if they watch the lecture recordings on their computers (Kinash, Knight, & McLean, 2015). In other words, online learning or distance education is the lived-experience of most contemporary university students, whether they are officially registered as on-campus students or not. The shift from on-campus to online learning (or bricks to clicks) has also re-shaped the activities students *do* as part of their learning, which authors such as Biggs (1999) describe as the essence of the educational experience. A list of student actions and activities provided by Lebenicnik, Pitt, and Starcic (2015) serves as an operational definition of *online learning*:

> This may include watching educational videos and video lectures, reading e-books, online articles, slides, online text and documents, and blogs, and listening to podcasts . . . [and] playing educational games, using virtual environments for learning, . . . using ICT for self-assessment, [and] using ICT for planning the learning process.
>
> *(pp. 99–100)*

Fabian and MacLean (2014) add five additional tasks to the list, including "use of multimedia tools, use of apps, creation and use of a bespoke app, multimedia manipulation and sharing, and creation of an online e-portfolio" (p. 1). The introduction of online learning has transformed *how* students learn from three perspectives: shifting their modality from on-campus to online, changing the very nature of their learning activities, and advancing their achievement and retention (Carle, Jaffee, & Miller, 2009; Kinash, Brand, & Mathew, 2012).

Another major change in the context of universities is the increased diversity of the student population (Devlin & McKay, 2016; Wood, Scutter, & Viljoen, 2017). Returning to the grandparents of

today's university students, most of the students who enrolled in university were the high achievers in secondary school and they tended to leave school, mostly at 18 years of age, and go right into university. Males mostly studied engineering and science, and females mostly enrolled in nursing and education. In countries such as the United States and Australia, almost all of the students were Anglo-Saxon Caucasians. There was a noticeable lack of cultural diversity. In the Australian context, this meant that there were almost no First Peoples, or in other words, Australians of Aboriginal and Torres Strait Islander descent. Notably, while participation of Australian First Peoples in university has improved, the situation remains dire (Behrendt, Larkin, Griew, & Kelly, 2012; Oliver, Rochecourte, & Grote, 2013). Furthermore, an ethnographer of the past would be hard-pressed to find a student in a wheelchair or using a walking assistant. The age range of *today's* university students is diverse, and many learners enroll after gaining substantive skills and experience in the workforce (Baxter & Britton, 2001; Heagney & Benson, 2017). The entry scores and prior academic achievement of enrolled university students also widely vary. There are now more female than male students, and even though there are still gender biases across many disciplines, the profile is mixed (Universities Australia, 2017). Students (and/or their parents and grandparents) now come from many countries with wide cultural diversity (Heagney & Benson, 2017; Universities Australia, 2017). Finally, while the percentage of people with disabling conditions with a university education is still depressingly lower than the percentage of people without, the overall diversity of students, including those with a wide range of disabling conditions, is far more redeeming than in the past (Seale, 2006).

The statistics, in the United States and in Australia (where the chapter authors live), and indeed globally, provide evidence to support all of these trends. There has been a notable increase in the proportion of students with disabling conditions within the university sector, in both Australia and the United States (Hollins & Foley, 2013; Lersilp, 2016). This has been tracked and documented within the Australian context, with a marked 106% increase in students with disabling conditions from 2008 to 2016 (Universities Australia, 2018). While not as stark, there has also been an increase in the proportion of American students with disabling conditions within the postsecondary context, increasing from 10.9% in 2007–2008 to 11.1% in 2011–2012 (United States Department of Education, National Center for Education Statistics, 2016a). These statistics highlight the ensuing diversification of the 21st century student cohort.

Parallel to this increase in student diversity has been the increase of online education. While the figures are murky, due to classifications such as *multimodal* (both *online* and *on-campus*) and entirely *online*, there is no doubt that there has been a steady increase in the number of students either studying wholly or in part online. In the United States, the Babson Survey Research Group (2015) found that at least 28% of students are studying at least one course (otherwise referred to as unit of study) online. Furthermore, the United States Department of Education, National Center for Education Statistics (2016b) reported that 14–14.5% of U.S. students are studying completely online. This proportion of online students is congruent with Australian statistics, with the Australian Bureau of Statistics (2012) stating that in 2010, 12% of students studying in Australia were completing their studies online. In summary, as these statistics highlight, more students are studying online, with the university sector becoming more diverse with an expansion of enrolments by students with disabling conditions.

The key question addressed by this chapter is: how do these two trends interact? Have online technologies leveled the playing field for students with disabling conditions, or has the growing complexity of technology meant that more students have been shutout of education? Are online students with disabling conditions engaging and succeeding in ways that they would not on campus? Or is the opposite the case?

In 2004, the first author's team review of 2000–2003 literature at the intersection of online learning and disability was published (Kinash, Crichton, & Kim-Rupnow, 2004). The authors' overall interpretation of the review was that "improving accessibility of online learning for students with

disabilities will promote best practices in online learning for all students" (p. 5). Through a comprehensive search, the authors found only 43 published documents that had *disability*, *online learning*, and *higher education*, or close synonyms, as keywords. Of these, only five presented findings from empirical research studies. This trend has dramatically changed, in that in 2018, there is a plethora of empirical studies researching how to design for, and support, online learners with disabling conditions in higher education. A large number of these studies are reported in this chapter.

This chapter uses the definition of students with disabling conditions as provided by Seale, Georgeson, Mamas and Swain (2015), including, "any student who has a sensory, cognitive, physical or psychological impairment and who may benefit from using technological tools and related services to support and promote access to equitable educational experiences and outcomes" (p. 118). Notably, this chapter intentionally uses person-first language in writing, *students with disabling conditions* as opposed to *disabled students* (Brown, Bayer, & MacFarlane, 1989). This use of language has a long and well-informed history in *Disability Studies* (Bishop, 1994; Longmore, 2003; Marks, 1999; Seale, 2006; Shapiro, 1994), and there are three rationales for this form of expression. First, stating the *student* role prior to *disability* (i.e., students with disabling conditions) indicates that particularly in the context of this chapter, the role of *student* is more paramount than the person's connection to disability. In other words, *disability* is only one facet of the student's identity, just as are his or her race, religion, height, or hair color. Second, and closely connected to the first rationale, using language in this manner sends a strong message that the student's *being*, consideration, and/or relationship with others is not to be overshadowed by the facet of disability. Third, the expressed language is *student with a disabling condition*, as opposed to *student with a disability* because a person cannot *have* a disability (Longmore, 2003; Marks, 1999; Seale, 2006; Shapiro, 1994). If the environment (including that of online learning) were entirely user-friendly and accessible, disability ceases to exist. The student's characteristics (including cognitive and/or physical attributes) are disabled when the environment does not support his or her full and equitable participation. For example, a student in a wheelchair is not disabled until there is no ramp to access the building. In the online environment, the blind student is likewise not disabled until the course design does not allow him or her to use screen-reading software to hear the course content (Vaughn & Omvig, 2005). When quoted authors have not used person-first language (i.e., *disabled students*) this language has been retained in this chapter, but when the chapter authors refer to students, the respectful language will most often be *students with disabling conditions*. There are exceptions, such as the use of *deaf students* and *blind students*, because this language use is the explicit preference of the respective self-advocacy organizations, and thereby part of situated cultures (Shapiro, 1994; Vaughn & Omvig, 2005).

This chapter argues that within higher education there exist both metaphorical *snakes* and *ladders* at the intersection of technology and disability. In other words, there are current forces that propel students with disabling conditions forward, and there are adverse challenges that see students falling downwards and sometimes right out of the education system. According to Konur (2007):

> The increasing use of computer-assisted teaching and assessment in higher education courses has brought both opportunities (inclusion of disabled students in computer-assisted courses with suitable disability adjustments) and threats ('digital divide'—exclusion of disabled students from computer-assisted courses without suitable disability adjustments) for disabled students.
>
> *(p. 209)*

Figure 21.1, a *framework of enabling and disabling effects of technology for diverse learners studying online*, will now be fully described in text for three reasons (Sapp, 2009). First, in keeping with an important philosophy of *nothing about us without us*, it would be ludicrous for a chapter about the success at university of students with disabling conditions to be inaccessible (and thus unreadable) by students

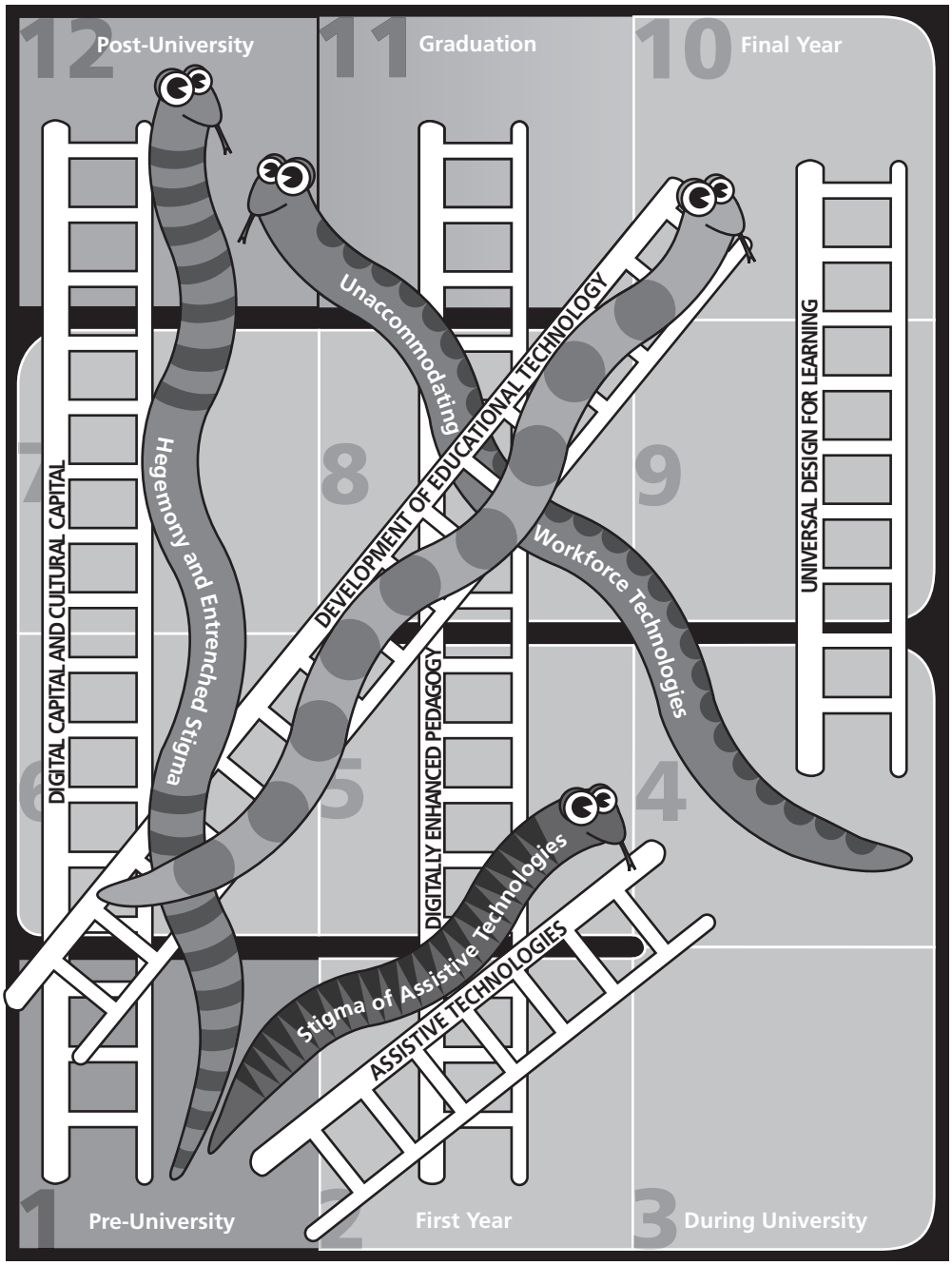


Figure 21.1 Framework of enabling and disabling effects of technology for diverse learners studying online

with vision impairments. Second, readers who are new to designing education for full participation by students with disabling conditions can use this text description as an example. Third, some readers who do or do not have disabling conditions may achieve heightened clarity regarding the intent of the image through reading the text description (and thus the authors' explanation).

Description Embedded Language for Framework

The image is loosely fashioned after the board game *Snakes and Ladders*, which is played with a game board, game pieces, and dice. The goal is to be the first player to reach the final square on the game board. When the roll of dice results in a player landing on the start of a ladder, the player skips ahead on the game board to the top of the ladder and plays on from there.

Conversely, when the roll of dice results in a player landing on one end of a snake, the player goes backward on the game board to the end of the snake that is lower down on the game board. Thus, ladders are metaphors for advantageous life elements and snakes are metaphors for deterrents. This image is not a full game board. There are only 12 game board squares and only the first and final three are labeled. The first three are: (a) Pre-University, (b) First Year and (c) During University and the final three are: (a) Final Year, (b) Graduation and (c) Post-University. There are four snakes and five ladders shown on the image, each of which are described in the next two paragraphs.

As shown in Figure 21.1, there are two stand-alone *ladders* that foster student success during university and post-university into the workforce. Respectively, these ladders are *assistive technologies* (the specialized tools, devices, and software that allow students to access university curriculum, such as text-to-speech software for blind students) and *digital capital and cultural capital* (functional proficiency in working with technologies, with people from diverse backgrounds and with diverse beliefs; for example, deaf students understanding blockchain and the nuances of deaf culture). Likewise, there are two *snakes* starting long before, and often preventing students from, attending university and which can create barriers long into university and thereafter. These two snakes are *hegemony and entrenched stigma* (which means that people with disabling conditions are often judged and identified only by their disability, and furthermore that limits and ceilings are imposed upon them) and *stigma of assistive technologies* (in that many people with disabling conditions sometimes refuse to use the tools, devices, and software that could make education accessible because this use might identify them as disabled and result in stigma and hegemony). There is another factor, which is both an enabler and a disabler, and Figure 21.1 therefore shows a *snake* lying over a *ladder*. This factor is *development of educational technology*. As will be detailed in the pages below, the hardware and software used within universities has evolved such that in some instances, circumstances, and for students with certain disabling conditions, there is full inclusion and participation without barriers. At the same time, other digital advancements have created new barriers and steepened the playing field like never before.

There are three more factors that are embedded in the university process and thereby commence after the students are in first year and beyond. The first *ladder* is *digitally enhanced pedagogy*, which can assist students with disabling conditions right through to graduation. This means that universities have designed learning and teaching such that curriculum and assessment take full advantage of the affordances introduced by modern technologies. The next *ladder*, which takes effect during university and continues to the final year, is *universal design for learning*. A consequence that often surprises university academics is that when they make changes in course design for a student with a disabling condition, accessibility, engagement, and learning improve for many other students without disabling conditions. Finally, there is a *snake* lurking beyond university. This *snake* can often occur once the student with disabling conditions has graduated and joined the workforce. While most universities are now making efforts to greater address the needs of students with disabling conditions, some graduates do not find this same effort with their new employers, and thus the *snake* of *unaccommodating workforce technologies*. This snake can slide the graduates out of the workforce and sometimes back into the university for further education.

This chapter proceeds to elaborate on each of the *snakes* and *ladders* just introduced. The statistics and propositions of disablers and enablers are outlined. Furthermore, detailed examples from empirical literature, and from the experiences of the authors, are provided. Finally, the chapter will conclude

with recommendations for enabling, as opposed to disabling, the university experiences of diverse students through efficacious use and embedding of technology.

Digital Capital and Cultural Capital

Capital is a relatively new concept borrowed from the banking context and applied to the higher education sector. Digital capital means "the resources and benefits that can be utilized by communities, from Internet infrastructure to online information, modes of communication and tools, to digital literacy and skills" (Roberts & Townsend, 2015, p. 202). Seale et al. (2015) identified five essential elements of *digital capital* that when planned, delivered, and evaluated consistently, in partnership between the student, the institution, and the student's wider support network, can assure success of students with disabling conditions in university. These elements are:

1. Technological know-how.
2. Informally investing time in self-improvement of technology skills and competencies.
3. Influence of family and institution attended prior to higher education in offering early and sustained access and encouragement to use technology.
4. Networks of face-to-face technological contacts.
5. Networks of online technological contacts (p. 120).

The authors further elaborate that purely denotative definitions of digital tools and resources provide only partial solutions for students with disabling conditions. Success can only be achieved if digital advancements are considered in the context of *cultural capital*. The authors define cultural capital as "the possession of cultural competencies and knowledge that enable people to be cultural consumers in ways that are valued and expected in society" (p. 119). A concrete example is the culture of blindness. Most blind people assert that they are ordinary human beings who happen not to be able to see (Kinash, 2006). This means that in order to fully function in society, the public at large (and in this case, university staff and students) need to embrace this culture and view obstacles as part of the environment (as opposed to inherent to the blind individual), and thus optimize efforts to remove these obstacles. This means that it is incumbent upon universities to design online learning such that *all* educational environments are accessible to, and promote the success of, *all* students, including those with disabling conditions.

Assistive Technology

While the thoughtful and well-informed design of educational environments (including online learning) radically improves accessibility and participation of students with disabling conditions, design does not entirely replace the need for assistive technologies (Seale, 2006; Vaughn & Omvig, 2005). Assistive technologies are hardware and software solutions that can be used by people with disabling conditions to personalize and specialize approaches to addressing specific challenges. For example, blind students usually require screen-reading software, but this software only works effectively if the design of the course materials and overall interface support the use of this software. To follow this example further, screen-reading software reads text aloud from left to right, followed by top to bottom. If there are tables or frames producing columns of text that make left to right reading incomprehensible, the software cannot work, no matter what version has been installed. Lersilp (2016) analyzed surveys completed by 140 students with disabling conditions enrolled between six institutions in northern Thailand. The survey queried provision, usage, and needs of assistive technology. The researcher reported that the surveyed students indicated needing assistive technologies such as "screen magnification, dictation software, Braille, and screen readers, in order to use

computers effectively" (p. 9). The researcher queried whether students with disabling conditions could experience success using the standard technological offerings (e.g., computers and LMS) provided that these technologies were designed in accordance with the propositions of universal design for learning (UDL). The research results indicated that most students with disabling students required *assistive* as well as *standard* technologies, and furthermore that universities are often negligent in the provision of these technologies.

Hegemony and Entrenched Stigma

Hegemony means that one dominant group of people controls another group of people (Bishop, 1994; Longmore, 2003; Marks, 1999; Seale, 2006; Shapiro, 1994). Obstructions and ceilings are placed in the way of the non-dominant group, which limits their success or progress. One does not have to look far for examples of ways in which members of society who do not have disabling conditions intentionally or unintentionally dominate over those people who do have disabling conditions. People with disabling conditions are the butt of insensitive jokes and insults—such as: *how could you make that mistake, are you a retard?; why did you cut me off in traffic, are you blind?; did you not hear what I said, what are you, deaf?* Media portrayals, such as blockbuster movies, unless designed to carry a message of enlightenment and advocacy, cast people with disabling conditions in undesirable and often fear-provoking roles. Design decisions are usually made by able-bodied people. When people with disabling conditions are given *seats* at influential *tables*, they are usually tokenistic, and their voices are not properly heard. People with disabling conditions are underrepresented in higher education, government, and the workforce (Bishop, 1994; Longmore, 2003; Marks, 1999; Seale, 2006; Shapiro, 1994; Vaughn & Omvig, 2005). Specific to higher education, many blind students who read braille wait until halfway through the semester (and the course is thus half over) before they receive their accessible version of course texts, simply because educators and other university staff do not plan ahead to ensure that the course materials will be provided in a timely, equitable and reasonable manner (Kinash, 2006).

Stigma is closely related to hegemony. Stigma means that groups of people are negatively judged and stereotyped based on a single characteristic (Goffman, 1959, 1963). In the context of this chapter, that single characteristic is a disabling condition. All blind students, all deaf students, all students in wheelchairs, etc., are lumped together in those groupings and summed up by others based on the one facet of having a disabling condition. Therefore, *all* blind students are considered to be the same, as opposed to diverse people who happen to be blind. Furthermore, people with disabling conditions are positioned as *others* and considered to be more different than having as much in common, or similar. It is therefore understandable that students with disabling conditions often prefer the de-identified and partially invisible nature of online learning. For many students, they can feel that online interaction is nearly sanctimonious, as compared to face-to-face. When the first author completed her doctoral research on *blind online learners*, she heard this perspective multiple times (Kinash, 2006). Students explained that they sometimes chose to tell only the *educator* that they were blind and asked those educators not to share this information with their student peers (all of whom were sighted). They explained that it came as a relief to be judged on the same basis as their student peers (e.g., on how well they argued their point on the discussion forum) vs. through the stigmatizing cloud of being *that blind person*.

Stigma of Assistive Technologies

It is, therefore, no wonder that students choose not to use assistive technologies that would otherwise help them because this could very well mark them as disabled and therefore trigger hegemony and stigma (Grimes, Scevak, Southgate, & Buchanan, 2017). This is particularly the case when disabling

conditions are "invisible" such as learning disabilities. Students will often go to great lengths to keep these disabilities hidden, thus preferring *failing out* to *coming out*—particularly on-campus students, who usually need to self-identify and register with the equivalent of the *Disability Office*. Rather than ensuring that all computers are loaded with accessibility software and easily switched settings, many universities continue to have a *special lab* that has the only accessible computers on campus. This *lab* is often placed in an undesirable part of campus with shabby furnishings and low light, indicating that students with disabling conditions are less deserving than other students. Once again, online learning can be less stigmatizing than on-campus because the student can use assistive technologies, away from the watchful (and judgmental) eyes of peers, and appear *normal* to others (Heiman & Shemesh, 2012). It is incumbent upon the university, then, to make the online environment as accessible as possible and to ensure that the student is supported with access to the additional assistive technologies that he or she requires.

Development of Educational Technology

The advancement of technology has had both positive and negative effects on today's education systems and workforce. For example, while technological advancements have provided opportunities for professionals with disabling conditions to enter the workforce, at the same time computerization and automation have substantially changed and threatened the continued existence of some jobs (Committee for Economic Development of Australia, 2015; Durrant-Whyte, McCalman, O'Callaghan, Reid, & Steinberg, 2016).

One of the technological advancements that can be readily applied to educational contexts, and particularly online learning, is that of broadband. Smyth's (2005) research confirmed that using broadband videoconferencing (as opposed to synchronous Web conferencing using desktop computers) facilitates natural communication without distracting time lags in audio and/or video. One of the explicit advantages Smyth (2005) included was that broadband videoconferencing enables universities to "become more inclusive for students with disabilities or limiting geographical/familial circumstances" (p. 817). She provided a specific example of a distance student who was on a life-support system. She wrote that he "interacted constantly with peers and effectively led one group because he could observe his fellow students in the lecture theatre, see the internet sites that the teacher was demonstrating, and respond to questions in real time" (p. 814). The author went on to describe peer connections (between this student and the other students) made through this online learning experience that became extended outside of the broadband.

As stated earlier, development of educational technology can be an enabler/ladder or a disabler/snake. One of the key findings from Hollins and Foley's (2013) research into the user experiences of 16 university students with learning disabilities provides an illustrative example of the deleterious consequences of development of educational technology across higher education. As the technology has become more readily available, universities are applying electronic/automated help features with pre-recorded messages and text-based process sheets to numerous online sites. One example is using digital rather than human help on library pages, to assist users in finding source texts. Many of the students in Hollins and Foley's study said that the resultant decline in human services impedes their learning. These students with learning disabilities reported that past experiences of reading electronic help over and over without understanding/arriving at solutions means that they no longer try to use these technologies and go without help.

Digitally Enhanced Pedagogy

Digitally enhanced pedagogy is becoming more a part of our everyday life, with new and innovative technologies required to solve ever-increasing problem complexity (Jones, Ramanau, Cross, &

Healing, 2010). As younger learners enter higher education, there are parallel increases in expectations for students to be engaged by their pedagogical environment, with participatory, interactive, sensory-rich, experimental activities (either physical or virtual) and input opportunities. The student population is characterized as more oriented to visual media than previous generations, which seemed to prefer to learn through sensory and tactile means by doing rather than by listening or reading. This has resulted in a shift away from traditional face-to-face, didactic lectures and tutorials, to self-direction and technology-enhanced teaching and learning through multiple delivery modes and methods. Adams Becker et al. (2017) specifically highlight case studies using innovative technology-rich pedagogy to support the inclinations of such learners. This includes innovations in three-dimensional (3D) printing to transform digital artifacts into physical objects; virtual reality, which allows learners to experience encompassing human-scale interactions; augmented reality, whereby students may utilise their own smart phones or devices to supplement their learning.

The second author's own experience in higher education innovation (as an educator) is in the area of mixed reality (or the spectrum between physical and virtual) and how digital experiences can be developed to enhance pedagogy and bridge the digital divide between those who study across teaching modes. Most notably, the second author explored the use of mixed reality applied through mobile smartphone applications to enable distance paramedic students to have equal access to training simulations (Birt, Moore, & Cowling, 2017). Students who study at a distance do not often have access to expensive training mannequins, but are required to be familiar with specific lifesaving skills. This smartphone application *mixes* together 3D printing, virtual reality, and augmented reality to allow learners to practice lifesaving airways skills on digital patients using physically printed tools.

However, this innovation presents a double-edged sword with able-bodied students being able to practice skills in the comfort of their own home but disadvantaging some students with disabling conditions, especially those learners with vision impairment or motor learning challenges who would find it difficult (if not impossible) to use this particular mixed reality technology. This is compounded by challenges for learners with limited bandwidth Internet connections, particularly when there is an increased requirement for interactive visual data intensive pedagogy.

Another of the most notable contemporary advancements in digitally enhanced pedagogy is that of gamification. As argued by authors such as Villagrasa, Fonseca, Redondo and Duran (2014), gamification does not mean playing games in class. What it does mean is that the principles, affordances, and advantages of online games are embedded with pedagogy. Some of the features of online gaming that make it particularly enjoyable, and often even addicting, are that they are played with others, there are defined goals and objectives, there are strong elements of competition (players, e.g., students receive immediate and specific feedback), they learn over time and with experience (e.g., formative assessment), and players often feel a sense of pride and accomplishment. Some of the ways that imaginative academics have applied these game principles to learning is by designing a clever game narrative that runs throughout the semester, with challenges, objectives, and achievements in teams (groups). Students are awarded experience points (XP), which they can track all along and which are taken into consideration, and thus aligned with their final grades. Gamification can work especially well in online learning because the mechanisms of the digital interface are amenable to the gameplay and the environment feels ordinary and familiar to players/students. Furthermore, online students with disabling conditions can use their regular and familiar accessibility settings and assistive technologies to ensure full participation.

Universal Design for Learning

Universal design for learning (UDL) is the most common theme of research in the context of supporting the educational success of students with disabling conditions (Center for Applied Special

Technology, 2011; Rose, Harbour, Johnston, Daley, & Abarbanell, 2006; Rose & Meyer, 2006). There are numerous empirical studies providing evidence of the value of UDL, particularly when used to design online learning. Watchorn, Larkin, Ang and Hitch (2013), for example, used UDL to design courses in the disciplines of architecture and occupational therapy, and reported observational and self-reported gains in student learning outcomes. UDL is an extension of a concept originally conceptualized in the field of architecture (North Carolina State University, The Center for Universal Design, 1997). UD (without the L) meant that features of the built environment were created such that they could be easily modified for use by consumers with highly differing needs. For example, by squeezing the low-resistance levers on the Varidesk (n.d.), office workers can choose to stand or sit while working. When applied to the educational context, this means that the needs of diverse students can be met by developing curriculum, assessment, and interfaces that are flexible and easily customized. For example, in the specific context of online learning, the same content might be uploaded in three modes: video with captions, podcast, and text-based transcript. Students with varying challenges and needs could then choose whether to access one, two, or all three versions. Students with visual impairments are most likely to listen to the podcast and/or to the transcript through screen-reading software. Deaf students would read the transcript. Students from non-English speaking backgrounds may choose to listen to the podcast and then reinforce their learning by reading the transcript so that they can see the terminology spelled out. While there are still too few publications presenting empirical investigations into UDL, those that have been conducted confirm that whenever educators make changes for students with disabling conditions, many other students (without disabilities) view the alterations as improvements (Kinash, 2006; Kumar & Wideman, 2014). Authors such as Dell, Dell and Blackwell (2015) demonstrated that the propositions of UDL apply just as much, if not more so, to online learning as to on-campus learning. For example, Kinash (2006) reported that when an educator changed the font to san-serif for an online student with a visual impairment, a number of other students (who did not know that their student peer had a visual impairment) provided unsolicited feedback that the curricular materials were easier to read. Further, when another educator improved the navigation of the discussion forum (again for an anonymous student with a visual impairment), again there were emails and thanks from numerous other students, all of whom were sighted (Kinash, 2006). This widespread positive impact of UDL is so paramount that the hallmark metaphor of UDL is the curb-cut. The slope easing the physical transition from sidewalks to street-level were designed for wheelchair users. However, they are more frequently used by parents pushing strollers, shoppers with carts and cyclists. When applied to the online interface, the term "electronic" is added, making the metaphor: electronic curb-cut.

There are three key propositions that enable the impact of UDL on education (Rose & Meyer, 2006; Wood, Scutter, & Viljoen, 2017). The first proposition is multiple means of representation, which means that the educator creates and provides access to the learning materials in diverse and complimentary forms. For example, the educator might triangulate the teaching of a single concept by posting an audio podcast, a screencast showing both slides and complimentary narration, and a full text-based lecture transcript. The second proposition is multiple means of engagement, which recognizes that diverse students are motivated in different ways and that even a single student needs different reinforcement at various points in his or her educational journey. This means that various mechanisms designed to elicit participation and enthusiasm are inter-mixed. Sometimes marks and grades are very motivating. Often, immediate and specific feedback can work wonders. Appealing to student curiosity, and eliciting student questions which are directly responded to, also increase engagement. One of the multiple means of engagement that is often forgotten is explicitly telling students how the course-based knowledge, skills, and attributes will specifically serve to make them more employable (Kinash, Crane et al., 2015). The third UDL proposition is multiple means of expression. This means that students are supported to demonstrate their learning in ways that are meaningful

and best represent that particular student's capabilities. The first author often designs her online courses such that the expectations and marking criteria are clearly and explicitly posted alongside the assignment descriptions. As long as students meet these criteria, they are welcome to create their submission in whatever format they choose. It is far more interesting to mark a website, a video, and an essay than it is to mark paper after paper in the same format (Tobin, 2014). Experience shows that students put far more effort into assignments that they find meaningful and learn more when the student experience is co-constructed. Furthermore, employability is fostered because graduates can use these creative (and open) creations as portfolios or evidence of knowledge, skills, and attributes as part of career applications and/or interviews and on digital professional portfolios such as LinkedIn (Jorre De St Jorre & Oliver, 2018; Oliver, 2015).

Rao, Edelen-Smith and Wailehau (2015) demonstrated that educators can rigorously enact UDL "during the five phases of educational design (analysis, design, development, implementation and evaluation)" (p. 35). Tobin (2014) converted the three UDL propositions into five key strategies for designing online learning environments:

1. **Start with text:** Tobin recommends scripting and drafting all curriculum resources, whether lectures, podcasts or videos to stay focussed and create an easily followed navigational thread (p. 15).
2. **Create alternatives:** Identify the most-student-viewed documents and gradually build up a posted resource set of alternative versions, such as demonstration video tutorials, podcasts, and screencasts (p. 15).
3. **Let 'em do it their way:** Directly quoting Tobin, "instructors set the objectives; students define the method and medium" (p. 16).
4. **Go step by step:** Break everything (lectures, videos, assignment specifications) into chunks that are clearly labelled and sequenced (p. 18).
5. **Set content free:** This strategy is based on the natural interaction between open educational practice and universal design for learning (p. 18).

Tobin wrote:

> Use tools that are accessible and easy for faculty and students to learn. A good example is creating a screen-capture video of a PowerPoint slideshow with your own voice-over, and then hosting the result on a file-streaming site like YouTube. Where before, students needed to have PowerPoint in order to get the file and use it, now all they need is an Internet browser. Students on phones and tablet devices can watch the video anywhere. Content is no longer tied to the clock, either: students can review and study at any time.
>
> *(pp. 18–19)*

This quote illustrates that many educators are now striving for excellence in the student learning experience, but will the same level of care and support greet graduates as they enter the workforce?

Unaccommodating Workforce Technologies

While it has somewhat improved, there continues to be a relatively low participation of university graduates with disabling conditions in the workforce (Bishop, 1994; Longmore, 2003; Marks, 1999; Seale, 2006; Shapiro, 1994). It is therefore incumbent upon educators not only to pay attention to the technologies and technological skills that students will be using *within* the educational context, but also to support their transition into the workforce. Dailey (2006), a broadcast journalism professor, explained how he made reasonable accommodations so that Steven, a student who used a motorized

wheelchair, could fully participate in the learning experience. One of the first considered options was to create a special video camera, but Dailey discarded this route as it would set up Steven for failure upon graduation when he would be seeking a career as a journalist. Dailey (2006) wrote, "such a device would only exist in our department; therefore, this student could not reasonably expect to be hired at a TV station that had the same adaptive equipment" (p. 243). What Dailey did instead stands as an exemplar because he found a simple solution that Steven could easily replicate for full participation in his future workplace. They mounted a camera remote (which comes packed with even high-end cameras) to a board and strapped it to Steven's wheelchair. They then loaded off-the-shelf interactive software onto Steven's laptop. Dailey (2006) wrote, "his computer was his one equalizer, and he wielded it like a sword" (p. 246). Steven was able to fully participate in the course experience and excelled. These minimal, low-expense accommodations would also, no doubt, be considered worth it to future employers. The installation of the interactive software is conceptually easy to bridge to the context of online education. Online environments often include access to site licences for students' use on their personal devices. The adaptation to the use of the video camera provides a link to an important caveat to online learning. Some institutions refer to students who study purely online as external students rather than online students because there are components of many programs which require offline experiences. The example described here of a broadcast journalism student completing a practical experience is a relevant example. When considering accessibility and equity of student learning, we need to consider the full experience and not just the online components (and these needs to extend post-graduation into the workforce).

Table 21.1 Challenges and solutions for online learners with disability conditions

Disability Condition	*Challenges*	*Solutions*
Visual impairment	Screen-reader limitations	• Provide clear text descriptors for all images • Format for screen readers (left to right, top to bottom) • Provide skip-navigation options • Use clear, descriptive headings • Use sans-serif font (e.g., Arial) that has no extra decoration (for low vision)
Hearing impairment	Low to no audio access	• Insert text captions on all videos and tutorials • Provide full lecture transcripts
Motor impairment	Sometimes inability	• Mail out personalized devices such as mouth stick • Make all parts of course accessible by keyboard (i.e., alternative to mouse) • Design navigation to be straightforward and intuitive • Reduce number of online layers (i.e., few interlinked Web pages)
Learning disability	Cognitive challenges such as comprehension and retention	• Design LMS pages so that they are uncomplicated • Put most important information first • Use clear headings • Compile tasks and deadlines to provide one place • Clearly differentiate between required and extra resources • Use plain language when possible • Provide examples of "good" responses and assignments • Provide detailed assignment marking guides, criteria, and expectations

Practical Online Learning Course Design Recommendations

Catalano (2014) described challenges and solutions for university students with four types of disabling conditions. These passages have been reworded and arranged into Table 21.1. The table format demonstrates an accessible design that screen-reading software can interpret.

In keeping with the propositions for UDL, each of the solutions listed in Table 21.1 applies beyond the disability conditions with which they are specifically linked. It is not only students with visual impairments who benefit from clear, descriptive headings and san-serif font. Mature-age learners with multiple commitments such as dependent children and full-time careers often confine their studies to late evenings, when they are tired and their eyes are sore. Text captions on videos are useful to many other students in addition to those with hearing impairments. Many people (first author included) never watch an on-demand video (e.g., Netflix) without captions turned on. Most students are frustrated by playing digital hide and seek with online resources when they are provided many pages deep. This design feature applies much more broadly than for students with motor impairments. Finally, international students (particularly those from non-English speaking [NESB] backgrounds) request the same solutions as do students with learning disabilities. The first author had an online student from Burundi, East Africa who discovered halfway through the course that he had not found the resources read by his student peers because he had never before used an LMS and simply did not know the resources were there. Most international students (NESB) need to both hear and see new vocabulary before they can assimilate it. These applications across disabling conditions and other student diversity factors demonstrate the key strength of UDL, which is that when educators make changes for students with disabling conditions, the student learning experience improves for many, if not most, students (Kinash, 2006; Kumar & Wideman, 2014).

Recommendations for Professional Development of Online Educators

In the interests of developing quality, accessible online learning experiences for all learners (including those with disability conditions), it is fundamentally important that educators receive adequate professional development. He (2014) took a creative approach to empirically addressing this issue. He designed an online course in keeping with the propositions of UDL to teach future online teachers how to teach online. He administered a pre-test and a post-test to 24 students (future teachers) and also collected ongoing feedback. Results confirmed that the future online educators "not only enhanced their online learning self-efficacy and confidence in learning online through taking the online course, but also developed their confidence in their ability to teach online" (p. 291). He extended what was previously documented in the literature by adding key "success indicators" of online learning from the perspective of future online educators, such as "including learner activity variety such as synchronous sessions, discussions, weekly announcement, group project and field experiences" and encouraging students' "voluntary use of tools such as BookBuilder, Photo Story, Voice Thread etc." (p. 294). Similarly, Hinshaw and Gumus (2013) shared a case study depicting five teachers studying online to learn more about teaching online. Data collection was through interviews and participant observations. Results clustered into three themes: online students (teachers) made a connection that extended beyond the parameters of the course; teachers extended their knowledge of teaching and became more efficacious; and they stepped beyond technologies that they used as learners (e.g., overhead projectors) to applying the affordances of online technologies (e.g., e-assessment). In the development of quality online learning, it is wise to remember that staff *are* the university.

Conclusion

Alongside the massification of the higher education sector and the shift to increasing online student enrolments, so too has the diversity of the student population multiplied. Enrollments of students

with disabling conditions have markedly increased in both the Australian and American contexts, and while this chapter has not focused on the cause for this, it has sought to elucidate a number of challenges and strengths that technological advancements in online education have offered this diverse cohort. These challenges and strengths are outlined within the *framework of enabling and disabling effects of technology for diverse learners studying online* developed by the authors. Embedded throughout this chapter, the authors provided a number of recommendations for educators to consider when designing and delivering online content to ensure it is more accessible and engaging for students. These recommendations support the finding that when educators improve content to enhance accessibility for students with disabling conditions, in turn, students without disabling conditions also perceive the amendments as improvements.

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22

ASSESSMENT FOR CULTURALLY INCLUSIVE COLLABORATIVE INQUIRY-BASED LEARNING

Linda Barril

Online environments enable people from across the community, the country, and the globe to work together in our modern "age of globalization, in which demands are high for complex social engagement in various learning and performance settings" (Gu, Wang, & Mason, 2017, p. 22). As increasing numbers of national and multi-national professional organizations look to collaborative online teams to solve complex problems (Minton-Eversole, 2012), postsecondary students need an education that prepares them for this job market (National Academies of Sciences, Engineering, and Medicine, 2017; Williams, 2016). To this end, many multidisciplinary educators advocate using collaborative inquiry-based learning (IBL) methods that focus on providing relevant and practical skills for transfer to future academic and professional work (e.g., Lu, Bridges, & Hmelo-Silver, 2014; Williams, 2016). Postsecondary online courses and programs are particularly well-suited to adopting a collaborative IBL approach that can simulate a contemporary professional work environment in which students from diverse backgrounds actively work together to solve timely and important problems. With business as the top field of study for both undergraduate and graduate students (McFarland et al., 2017) and with ongoing online enrollment increases (Allen & Seaman, 2017; McFarland et al., 2017), collaborative IBL is a particularly appropriate online instructional method. Learner assessment for collaborative IBL poses specific challenges, however, that must be addressed in order to support the effective development of transferable knowledge and skill. This chapter focuses on assessment for diverse learners in postsecondary online collaborative IBL environments with small class sizes. Beginning with a brief overview of IBL, student diversity is discussed in terms of cultural inclusion in online learning environments. Next, assessment challenges and solutions are reviewed with a focus on collaborative open-ended learning for groups and individual contribution. The chapter concludes with a brief description of the role of the instructor and technology for collaborative IBL.

Collaborative Inquiry-Based Learning

Inquiry-based learning encompasses problem-based, case-based, and project-based learning methods, and has been effectively implemented in online learning environments (e.g., Gunawardena & Jayatilleke, 2014; Hong, Hwang, Tai, & Tsai, 2017; Lai, 2017). IBL generally consists of the presentation of an authentic, relevant, real-world problem (or question) that needs to be solved by the learners, whereby the instructor facilitates and supports, rather than directs, the learners through the learning process (Buchanan, Harlan, Bruce, & Edwards, 2016). At its heart, IBL is learner-centered and aims to develop learners' critical thinking and problem-solving skills for transfer to future academic and

professional work. When developed within the social constructivist perspective (Vygotsky, 1978), IBL is a collaborative group effort in which learning occurs through participant interaction where their distributed knowledge and understanding leads to socially constructed new knowledge (Pea, 1993). In this view, the collaborative process of the group is just as important as the solution product.

Cultural Inclusion

Collaborative IBL is useful because it allows diverse learners to combine their unique perspectives, knowledge, and expertise to solve complex problems (Pea, 1993). These interactional experiences provide opportunities for deeper understanding of a problem and the development of a more comprehensive and robust solution (Gweon, Jun, Lee, Finger, & Rosé, 2011). In educational settings, globalization is viewed especially favorably as bringing together multiple perspectives in which differences of age, gender, and cultural background enhance the outcome solution.

Culture is widely believed to influence students' ways of learning (e.g., Ke & Chávez, 2013; Ke & Kwak, 2013), but culture is particularly difficult to define because it "is dynamic, active, changing, always on the move . . . as a result of political, social, and other modifications in the immediate environment" (Nieto, 2018, p. 67). Culture may refer broadly to nationality and ethnicity, but also to a great variety of "identifiable subcultures that display subcultural traits that set them apart from the rest of society, for example, in the way they dress, communicate, relate to each other, and relate to other subcultures and society as a whole" (Jung, 2014, p. 15). Cultural affiliation is quite complex, and individuals may simultaneously self-identify with seemingly disparate groups. For example, "one Mexican American lesbian may identify herself first and foremost ethnically, another may identify herself as a lesbian, a third as both, and a fourth primarily as a member of the working class" (Nieto, 2018, p. 69).

From this macro-mezzo-micro perspective of culture, learning environments may constitute their own separate cultural distinctions. In the online environment, for example, the notion of *learning cultures*, described by Goodfellow and Lamy (2009), occurs when "technology is a player in the social interaction through which online learning cultures are built" (p. 6). This is sometimes referred to as *idioculture*, a concept developed by Gary Alan Fine and cited by Cole and Engestrom (2007), in which "culture is experienced as part of a communication system of a small group" (pp. 6–7). Jung and Gunawardena (2014) explain how the idioculture concept "accommodates the idea of culture as emerging from a local activity system . . . where multiple cultural selves and hybrid identities interact with each other to form unique cultures of their own" (p. 7).

Within these unique online learning cultures the cultural perspectives of the instructor (and/or course designer) are of particular importance as they strongly influence instruction (e.g., Baird, Andrich, Hopfenbeck, & Stobart, 2017; Goodfellow & Hewling, 2005; Gunawardena & Jung, 2014; Parrish & Linder-VanBerschot, 2010). Indeed, "Culture impacts every facet of online learning, from course and interface design, to communication in a socio-cultural space, and to the negotiation of meaning and social construction of knowledge" (Gunawardena & Jung, 2014, p. 1). Because "Culture, communication and learning are intertwined and interdependent" (Lum, 2006, p. 113), it is vital that postsecondary online collaborative IBL and assessment supports culturally inclusivity. Cultural inclusivity is "about acknowledging and valuing differences, about enabling the values and worldviews of all students to be given expression in teaching and learning" (McLoughlin, 2001, p. 12). The design of specific learning and assessment goals that focus on inclusion allows it to be a skill that can be developed through continued awareness and practice.

Assessment

Assessment in educational settings is used to evaluate student work in terms of product and/or performance (Sadler, 1989), and provides instructors a means to guide learners and to improve instruction

(e.g., Bennett, 2011). Assessments may be formal, using testing instruments, or informal, through dialogue and discussion. The results of assessment provide feedback to learners (i.e., how well they are meeting performance/product objectives) and instructors (i.e., effectiveness of the instruction), and plays a critical role in effective teaching and learning (e.g., Carless, Salter, Yang, & Lam, 2011; Evans, 2013; Hounsell, McCune, Hounsell, & Litjens, 2008; Sadler, 2010; Yuan & Kim, 2015).

Education assessment typically includes both summative assessment (done at the end of a learning period) and formative assessment (used throughout the learning process). Summative assessment is primarily used to evaluate and document (i.e., grade) student achievement at the end of a course or program, while formative assessment "provides feedback correctives at each stage of the teaching-learning process" (Bloom, 1969, p. 48). Formative assessment, often described as assessment *for* learning (e.g., Bennett, 2011; Torrance, 2012) and "timely and informative feedback" (Spector et al., 2016, p. 59), is highly favored and widely used in contemporary educational settings (e.g., Torrance, 2012; Evans, 2013).

Summative assessment is often described only as assessment *of* learning; however, many argue that it is most effective when used together with formative assessment *for* learning (e.g., Ashenafi, 2017; Bennett, 2011; Carless, 2015; López-Pastor & Sicilia-Camacho, 2017). This is particularly true when summative assessment is used for grading as "the summing up of achievement at a particular point in time" (Carless, 2015, p. 12), rather than done only once at the end of a course. Referring to this distinction as *periodic summative assessment* (as opposed to a final summative assessment) in this chapter, it is effective for providing milestones of achievement for learners and aids instructors in determining whether particular students need additional formative feedback.

Formative assessment, while widely used, is highly debated in the literature in terms of its effectiveness. Critics describe poor assessment instrumentation, research design, reliability, lack of generalizability (e.g., Bennett, 2011; Evans, 2013; Torrance, 2012), and definitional discrepancies, especially with regard to purpose (e.g., Bennett, 2011; Torrance, 2012). Although formative assessment is often based on learner-centered socio-cultural theories, such as Vygotsky's (1978) zone of proximal development (ZPD) and Lave and Wenger's (1991) Community of Practice (CoP), and is meant to support learning processes rather than confirming achievement in relation to specifically defined goals, Torrance (2012) argues that "it is still a basically behaviourist, objectives-based model which emerges in practice" (p. 329). Torrance (2012) warns that strict adherence of assessment to explicit learning objectives often leads more toward "*conformative* assessment" (p. 332, original emphasis):

> The clearer the task of how to achieve a grade or award becomes, and the more detailed the assistance given by tutors, supervisors and assessors, the more likely candidates are to succeed. But transparency of objectives coupled with extensive use of coaching and practice . . . is in danger of removing the challenge of learning and reducing the quality and validity of outcomes achieved. This might be characterized as . . . assessment as learning, where assessment procedures and practices come completely to dominate the learning experience, and "criteria compliance" comes to replace "learning."
>
> *(Torrance, 2007, p. 282)*

In order to safeguard against overly rigid alignment with learning objectives which might hinder learning, Torrance (2012, 2017) suggests a focus on collaborative instructor-learner interaction in which assessment flexibility is a key component:

> We need to understand our task as one of collaborating with students to bring about learning, to be alert to the generation of unpredictable outcomes and indeed to regard the production of unpredictable and unintended outcomes as an indication of success, not lack of compliance with the programme. We need to make the rules of the game as apparent as

> possible, but we also need to try to communicate that we would be happy to see the rules of the game change, if someone comes up with better ones.
>
> *(2012, p. 338)*

While others agree that active learner participation in establishing learning (and assessment) goals supports learning (e.g., Carless, 2013; Evans, 2013), Torrance's point about assessment flexibility is particularly useful for collaborative IBL designs. The contextual alignment of assessment to the learners and their project at hand, rather than to rigid predetermined goals, is an important foundational consideration.

Additional effective assessment ideas are posed by Evans (2013) based on her thematic analysis on assessment feedback research in Higher Education from 2000 to 2012. Evans identified six key principles of effective assessment feedback (bracketed items are provided by the author for clarification):

1. Feedback is ongoing and an integral part of assessment.
2. Assessment feedback guidance is explicit.
3. Greater emphasis is placed on "feed-forward" compared to feedback activities. [i.e., feedback is sequential to guide learners forward throughout the learning process]
4. Students are engaged in and with the process [i.e., includes both peer and self-assessment].
5. The technicalities of feedback are attended to in order to support learning [i.e., focus on ongoing tasks/learning objectives rather than providing summative grades].
6. Training in assessment feedback/forward is an integral part of assessment design [i.e., learners receive instruction on how to assess their work and the work of their peers and how to use the feedback they receive] (pp. 81–83).

From these important foundational considerations on assessment, the next section focuses on collaborative IBL assessment.

Assessment for Collaborative IBL

As educators increasingly develop collaborative IBL instruction based on socio-cultural perspectives, there is a greater awareness that all learners bring unique perspectives and abilities, and that collaborative group work may lead them to achieve greater levels of understanding. Formative assessment is particularly useful and widely favored over summative assessment for collaborative IBL with its focus on group interaction processes and open-ended problems. Formative assessment in general, and for collaborative IBL in particular, is challenging and contrasts sharply with traditional educational assessment which focuses primarily on individual achievement in knowledge reproduction (Dron & Anderson, 2014; Spector et al., 2016; Williams, 2016). The real-world, or authentic, problem-solving skills required in collaborative IBL mean that there are no predetermined answers, and the collaboration efforts of the group take precedence over individual achievement. While group collaboration processes, including negotiation and knowledge creation, are the key focus, individual accountability to group processes is also necessary to help learners develop strong collaboration skills in the online environment. Assessment for collaborative IBL, therefore, should be used to support and guide learners within their groups and individually as well, and should incorporate both formative and periodic summative assessment (e.g., Ashenafi, 2017; Bennett, 2011; Carless, 2015; López-Pastor & Sicilia-Camacho, 2017).

Assessment Challenges and Strategies for Collaborative Inquiry-Based Learning

One of the biggest challenges of assessment for collaborative IBL is the considerable time and effort required of the instructor (e.g., Bennett, 2011; Spector et al., 2016; Williams, 2008, 2016). Creating

culturally inclusive, collaborative, and open-ended instruction and assessment for group work requires attention to a variety of collaboration processes (i.e., interaction, negotiation, knowledge construction), and to individual participation and contribution. In the following sections, some common challenges and solution ideas are discussed in terms of group collaboration, self-assessment, and peer assessment. The focus of this discussion is on postsecondary online collaborative IBL for small class sizes in which objective analytic measures are neither practical nor feasible.

Group Collaboration Assessment

The development of collaboration skills (i.e., interaction, negotiation, and knowledge building) within a culturally inclusive online environment requires a learning and assessment design that actively incorporates clear, yet flexible, performance expectations for each skill. It is particularly important for instructors and learners to collaboratively interpret and negotiate meanings, goals, and expectations (e.g., Carless, 2013) in terms of the project itself, which should ultimately guide the work. Both formative and periodic summative assessments that are aligned to mutually agreed upon learning objectives help to clarify, support, and improve collaboration processes for learners, and also helps to reveal interaction issues for instructors (Gweon et al., 2011).

One of the most common challenges of group work is establishing and assessing the difference between collaborative and cooperative efforts. Collaboration requires that all group members actively participate in the problem-solving process through interactive dialogue by sharing, negotiating, and creating new knowledge together. Cooperation, on the other hand, denotes a division of work by participants to complete their work individually and separately (Paulus, 2005). While group work invariably relies on both, collaborative IBL often aims to support greater collaboration efforts but often results in mainly cooperation efforts. Another common challenge of group collaboration concerns varying levels of participation and effort among group members, sometimes referred to as a "free-rider problem" or "social loafing" (Brooks & Ammons, 2003, p. 268).

Both of these challenges are clearly related to learning and assessment goals and methods. For example, Gweon et al. (2011) found that often, despite a group successfully meeting various assignment milestones (i.e., periodic summative assessments) throughout the learning process, problems with interactional process (i.e., collaboration vs. cooperation and participation) that are addressed only during the final summative assessment are highly problematic. Formative assessment feedback must occur throughout the learning process to support the development of collaboration skills. As a "supported sequential process" (Archer, 2010, p. 101), formative assessment allows the instructor to provide guidance through dialogue (both written and oral) with learners to both verify and elaborate on how learners can make their own discoveries and improve their understanding. In addition, descriptive statements, exemplars, and rubrics may be used to support the development of interactional competencies, as well as synchronous and asynchronous online discussions.

Other useful strategies include actively involving learners from the beginning, by providing them with a choice of work project, and giving them a voice in establishing performance and assessment criteria. Learners can also benefit from understanding the nature of collaborative group work itself. Yuan and Kim (2015) suggest that learners investigate and discuss the purpose, importance, and challenges of working in groups. In this way, they will understand that intentional effort is required from all group members. Related to this, cultural inclusivity is another skill that should be addressed through learning and assessment goals. Group members must be mindful of honoring and encouraging all participants to be involved in the project as a learning objective, while assessment can be used to address individual contribution and provide supportive guidance. Awareness of diversity (i.e., learner preference) is also useful in terms of participation issues. For example, some learners may prefer asynchronous written interaction (i.e., discussion forums) over synchronous interaction

(i.e., webconferences). Alternative interaction methods may be required to support group collaboration processes, which can be easily accomplished in the online environment.

Online technologies are especially useful for both synchronous and asynchronous learner collaboration, and typically provide automatic artifact preservation (i.e., webconference/recordings, discussion forum/transcripts). These technologies not only support collaboration processes but also provide assessment opportunities for the instructor who can actively participate with the group in real time or review the artifacts produced to provide guidance feedback to the group and to individuals.

Periodic summative assessment is beneficial when used in conjunction with formative assessment as grading can be an important incentive to encourage engagement and participation (e.g., Ashenafi, 2017). In collaborative IBL instruction, in which interactional processes are as important as products, periodic summative assessments need to focus on both process and product expectations. When well integrated, formative and period summative assessment will lead to a final summative assessment of work product (and processes) that is "the logical and expected end result based on the work done throughout the learning process" (Barril, 2019, p. 159).

Self-Assessment

Individuals need guidance to help them develop collaboration skills for contemporary academic and professional work. An integrated assessment design that includes instructor feedback, peer assessment, and self-assessment can effectively help to build these skills. However, despite the assumption that feedback leads naturally to performance improvement through inherent, automatic self-monitoring and self-regulating learner responses, it has been found that learners require assistance to understand and use feedback effectively (e.g., Carless et al., 2011; Evans, 2013).

The key strategy in addressing this challenge is to use formative assessment that includes "dialogic [instructor] feedback . . . in which interpretations are shared, meanings negotiated and expectations clarified" (Carless, 2013, p. 90). In addition, effective formative assessment for collaborative IBL necessitates the alignment of all assessment measures to overall learning goals. For example, where knowledge building is a group collaboration learning and assessment goal, knowledge contribution is an individual self-assessment goal (Barril, 2019).

Methods of formative self-assessment for collaboration may be both formal and informal. Formal self-assessment may require individuals to complete a survey in which they rate their contribution to their group project in terms of culturally inclusive interaction and work produced, while informal self-assessment may consist of private (for instructor) journal reflections (Barril, 2019). Formative self-assessment, whether formal or informal, is useful to learners for clarifying goals and improving performance, and to the instructor for determining how well the group is functioning so they can provide guidance and support during the collaboration process.

Peer Assessment

Peer assessment is another important facet of an effective learning and assessment design for collaborative IBL. Although peer assessment is often used to evaluate work products, it can also be used to evaluate group collaboration processes. In combination with formative assessment instructor feedback and self-assessment, peer assessment can enhance learners' understanding of both product and collaboration process expectations. Peer assessment allows individuals and groups to see "a wide range of moves or solutions to creative, design, and procedural problems, and exposure to these incidentally expands their own repertoire of moves" (Sadler, 1989, p. 140).

The literature on peer assessment has revealed numerous issues, including poor research design, inconsistent results, and lack of generalizability (e.g., Ashenafi, 2017; Evans, 2013; Topping, 2010). In

addition, there is currently no generally agreed upon terminology, theory, or practical model for peer assessment (e.g., Ashenafi, 2017; Kollar & Fischer, 2010). Despite such criticism, however, it is widely adopted in educational environments.

The main challenges in peer assessment in terms of both product and process are that learners are often reluctant to reveal issues due to concern about grades (Gweon et al., 2011) and about criticizing others (Sluijsmans, 2002). In the collaborative IBL context, peer assessment may be private (for instructors only) and/or public (for all participants). Effective peer assessment that focuses on collaboration processes should be formative and align with the overall group collaboration learning goals and assessment criteria. In addition to strengthening learners' understanding of expectations, peer assessment may help to increase learners' sense of accountability to their group and the collaboration process. This type of peer assessment is often private, shared with only the instructor who can use it to identify issues and provide corrective support and guidance to individuals and groups for improving interaction processes. This "private" peer assessment is most effective when directly related to self-assessment measures, and may also be formal or informal. For example, where formal self-assessment asks learners to rate their own participation with regard to culturally inclusive interaction and work produced, peer assessment may require individuals to use the same survey criteria to rate their group members' performance. Informally, private journals written for the instructor may ask learners to describe how their group worked on their projects, including reflections on what worked well and what issues may have occurred.

The "public" form of peer assessment, in which peer comments are openly shared with others, is also useful in collaborative IBL settings. Throughout the learning process, as groups work to solve their problems, periodic formal (i.e., graded) or informal presentations of their progress can provide useful learning opportunities for all learners. Peer assessment of works in progress, in the form of surveys and/or discussion feedback, may reveal alternative strategies while developing and improving evaluation skills (Evans, 2013), such as observation, comparison, and communication. Because collaboration as a process is a primary learning goal of collaborative IBL, group presentations should include a discussion of the interaction processes used, including what worked well and any issues encountered, and be open to peer assessment for the learning opportunities it affords.

Role of the Instructor in Assessment

The role of the instructor as a facilitator of learning is particularly useful for online collaborative IBL. The focus on relevant, real-world problems provides opportunities in which students across the campus or across the globe can combine their multicultural perspectives to develop the kinds of collaborative skills needed in a globalized society. The instructor, as facilitator, guides and supports the learning process rather than serving primarily as the content expert. In concert with the learners, the instructor establishes and insures that learning goals and assessment criteria are well-aligned with assigned projects, while remaining open and flexible to alternative approaches and solutions (Torrance, 2012, 2017). The integrated focus of assessment for the instructor in collaborative IBL consists of simultaneous attention to: (a) group collaboration efforts in terms of both processes and products; (b) individual contribution; and (c) the problem solution (i.e., product).

Role of Technology in Assessment

Online collaborative IBL for postsecondary education is typically mediated through a learning management system (LMS) such as Canvas, Blackboard Learn, or Moodle. The LMS provides a central location in which content is organized, managed, delivered, and accessed by all participants, and where all manner of interaction, both synchronous and asynchronous, takes place. Outside interaction and collaboration tools, such as Skype, Google Hangouts, Dropbox, and Cmap are easily linked,

and increase overall interactive functionality. Many of these technologies and tools support both synchronous and asynchronous group collaboration and knowledge construction processes and provide automatic documentation that can further serve as both learning and assessment resources.

Summary

Assessment is an important component of the learning process for collaborative IBL in postsecondary education. Both formative and summative assessment help to strengthen and guide the development of transferable collaboration and problem-solving skills that are required in today's academic and professional environments. This chapter illustrates the benefit of aligning assessment to learning goals in which group interaction processes, including cultural inclusivity, are of particular interest. An effective assessment design for collaborative IBL includes formative instructor feedback, as well as formative self and peer assessment that align with one another and with overall learning goals. Assessment criteria are most successfully established through instructor-learner interaction in which meanings are mutually interpreted and negotiated (e.g., Carless, 2013; Torrance, 2012, 2017), and are most useful in supporting learning when they remain contextually flexible in relation to the learners and the problem at hand (Torrance, 2007, 2012, 2017). Summative assessment, when used periodically throughout the learning process for grading and incentive purposes, can supplement formative assessment, and together lead to a final summative assessment with an expected outcome. Assessments may be both formal and informal, and support not only learner skill development, but also aid instructors in determining the effectiveness of the instruction in real-time and for future revision. The online environment is especially appropriate for collaborative IBL, in which diverse learners work together in a way that matches contemporary education and workplace settings. The large variety of online interaction technologies and tools currently available helps to expedite collaboration processes and enhance assessment opportunities. The automatic preservation of group interaction as knowledge artifacts, or products, provides participants with useful resources for learning, and instructors with essential materials for assessment.

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PART 3

Management, Policy, and Administration

An Overview

William C. Diehl

Thus far in this handbook, we have focused mainly on foundational theory, practice, and aspects of teaching and learning, including instructional design. Any distance education system depends upon policies, management, and an administration to provide the guidelines and leadership that are required for success. Among the topics that readers who are involved in leadership roles—or those who want to gain a better understanding of how policies, management and administration fit within a distance education system—will find Part 3 to be of value. Authors have penned chapters which include (but are not limited to) institutional leadership, strategic planning, needs assessment, policy, working in a globalized world, quality, legal and copyright issues, evaluation, and administrator and faculty participation.

Over the past two decades, educational institutions (which typically move slowly) and their leaders have faced the rising tide of distance education. In Chapter 23, Michael Beaudoin reviews the state of research in the area of leadership in distance education and then addresses the challenges that higher education and its leaders face as they consider their missions.

Moving into a more specific area than the prior chapter, Ray Schroeder and Vickie Cook focus in Chapter 24 on needs assessment and strategic planning. The authors present a framework of leadership and developmental essentials for successful programs (internal advocacy, entrepreneurial initiative, faculty support, student support, digital technology, external advocacy, and professionalism), and also provide resources which will lead readers to well-developed strategic plans.

Administrators have always faced shifting political winds that affect their organizations, and with the popularity of, and subsequent issues that arise with online education, navigating the governmental policy seas has become more of a challenge. Van Davis has authored a Chapter 25 that gives readers historical perspectives, provides a substantial look at current policy, and then offers a view of issues that lie ahead.

Whether or not leaders should continue to move, or begin moving into the MOOC arena remains a topic of interest. Sheila Jagannathan presents a Chapter 26 which is case study in nature and that illustrates the role that MOOCs can play in a globalized world—and how what may be considered to be disruptive technology can strengthen not only the ability of people to be lifelong learners, but can benefit institutions.

Accreditation, regulation, and standards are a part of the daily life of administrators, and these issues trickle down to faculty and course designers as well. Julie Porosky Hamlin and Lori Williams have contributed a Chapter 27 that reviews historical origins and discusses national and regional accreditation, as well as other providers that work to assure quality in distance education programs.

Copyright and legal issues are also of great concern to not only administrators, but to librarians, instructional designers, and faculty. In a Chapter 28 that provides a deep resource on copyright issues, Tomas Lipinski and Martin J. Brennan build upon Lipinski's prior chapters in previous editions of this handbook. A breakdown of copyright law, along with associated case law examples, will be of value to anyone who seeks an overview or requires specifics on this topic.

The never-ending debate about whether or not distance education is as effective as face-to-face teaching continues to create an accountability issue, and evaluation of courses and programs is at the core of this accountability—and of course, even if this debate was not taking place, evaluation is critical to quality. Patrick Lowenthal and Gayle V. Davidson-Shivers present in Chapter 29 what they refer to as *quality assurance frameworks* and also cover evaluation at the course, program, and institutional levels.

As distance education reaches the mainstream, there is more pressure on faculty and administrators who may have been resistant to participate. Rounding out this section, in Chapter 30, Kay Shattuck reviews the literature on administrator and faculty values, attitudes, and perceptions. Readers will take away an understanding of what the current literature has to show us about motivations and the importance of faculty development—and researchers will benefit from Shattuck's analysis of the research trends.

23

DISTANCE EDUCATION LEADERSHIP RECONSIDERED

Michael F. Beaudoin

Few institutional leaders today would not acknowledge that technological innovation is perhaps the single most compelling phenomenon that has and continues to propel them toward new organizational arrangements. For many, this likely represents the most significant developments since their institutions were established. Although educational entities may appear to be relatively static, they do gradually accommodate change, often in response to external factors that eventually force decision makers to adopt and adapt to new structures and systems. Certainly, this has been the case with those leaders who have successfully entered the distance education arena. Despite its seemingly inherent resistance to change, and an historical unwillingness to keep pace with innovations in other sectors, higher education has entered a more accelerated phase, and the resulting changes demand compatible leadership styles, including approaches that have not typically characterized how educational enterprises function.

Otto Peters, one of the first to make important contributions to distance education theory (1994 ff.), has written extensively about how distance education practitioners have incorporated entrepreneurial elements—such as division of labor, marketing, and quality control—that are more akin to operating a business than overseeing an academic entity. Such practices have evolved and merged with mainstream educational organizations to augment conventional modes of delivery, from correspondence to online, though some have chosen instead to establish entirely new and distinct distance education entities, rather than attempt to transform existing institutions. Roy McTarnaghan, founding president of Florida Gulf Coast University, in an interview reported in *The American Journal of Distance Education* (Beaudoin, 1998), tells of establishing that institution as a distance education provider in 1997. He noted that such endeavors must create a distinctive culture with a clearly articulated mission that is shared by all stakeholders, especially faculty, if they are to succeed. The viability of the more typical practice of introducing distance education into traditional institutional settings, and the sustainability of these endeavors, continues to challenge ambitious and innovative leaders. Frederickson (2005) examines this issue on the assumption that mainstream higher education is not receptive, culturally or structurally, to such alternative approaches. But others have found that integrating distance education into conventional academic environments can serve as a strategic initiative that ultimately enhances and strengthens the entire institution.

James Hall (1998) offered a thoughtful analysis of what new and emerging institutional structures might look like, and how leaders within them would be required to function. As traditional operations and distance education initiatives converge, decision makers who have historically dealt with separate and distinct programs within their institutions will have to manage networked functions

whereby proprietary lines between programs, faculty, and students are merging, and participants shift among formal and informal learning venues, without necessarily having any single point of reference. As alliances develop, largely prompted by networked technology and increasing competition, some institutions are evolving toward what Hall refers to as the meta-university. He argues that bold and creative leadership is required to manage these more complex structures.

As the field matures and presents an increasing array of new and unfamiliar challenges, what resources can best inform current practitioners, as well as prepare prospective new leaders for the work ahead? Opportunities include mentoring by seasoned administrators, attending professional meetings, enrolling in relevant programs of study, and remaining current with increasing scholarship in the field, but familiarity with research and writing as a source of guidance for aspiring leaders presumes that there is a useful body of work available.

What the Literature on Distance Education Tells Us About Leadership

Duning (1990) undertook an in-depth literature review addressing the topic of management in distance education, concluding that this area had attracted far less attention than other dimensions of the field. While there have been descriptions of program planning processes, and case summaries of management practices, little examination had occurred of leadership, however defined, within the distance education arena. In assessing the status of scholarly inquiry into this area, Duning asserted that the field lacked a theoretical framework to guide our understanding of practice, and that of all the foci of inquiry into distance education to date, management appeared to be the most neglected. The author of this chapter undertook the task of examining the status of this void a decade later (for earlier editions of this *Handbook*) to determine if it has been filled; and to ask, if not, why not; and if it has, to assess if any useful contribution has since been made to theory and practice in the area of institutional leadership in distance education.

At first glance, a review of literature in this content area from about 1990–2000 revealed a modest body of work. A content analysis was undertaken of titles and abstracts of articles appearing in two American publications (*The American Journal of Distance Education* [*AJDE*], and *DEOSNEWS* [an electronic journal]), both published by the American Center for the Study of Distance Education at The Pennsylvania State University. Also examined were issues of a European journal, *Open Learning*, as well as the contents of *Distance Education*, an international journal published by the Open and Distance Learning Association of Australia. Volumes examined in the *AJDE* revealed that—with the exception of the Summer 1998 issue, devoted entirely to distance education leadership (edited by this author)—relatively few authors wrote on topics with any clear connection to leadership. *DEOSNEWS* contained only two titles that have any leadership connotations, and although the European and Australian journals included several articles related to staff development and economics of distance education, no articles appeared on the specific topic of leadership. Thus, we concluded that prior to 2000, several widely read sources of research and writing in distance education theory and practice offered little on this topic. We did note during this period, the launch of a new publication, the *Online Journal of Distance Learning Administration* (*OJDLA*), published by West Georgia State University. This publication is now well established as an electronic journal for research and writing almost entirely focused on issues relevant to distance education administration that attracts numerous manuscripts for peer review, and is frequently cited.

A decade later, the two-volume study, *Online Learning as a Strategic Asset* (McCarthy and Samors 2009), supported by the Association of Public and Land-Grant Universities and the Sloan National Commission on Online Learning, reported results of a project (based on 231 interviews at 45 public institutions and nearly 11,000 responses to a faculty survey) intended as a resource for campus leaders. Volume 1 focuses on online learning as a vehicle for advancing an institution's strategic goals. Its overarching theme is that in an era when many institutions are finally embracing online learning,

few recognize the strategic value of such initiatives. The premise is that as technology increasingly pervades society, our academic institutions risk becoming "obsolete" if they do not adapt to changing demographics and market forces. The findings reinforce the argument that no institution today can afford missteps in such an increasingly complex enterprise. Numerous attempts to initiate distance education offerings have not been especially inspiring, and such failed efforts have dissuaded many decision makers contemplating activity in this area. As a consequence, in addition to limiting some universities' ability to become more relevant in the digital age, the lack of progress reinforces those skeptics who remain convinced that the online medium is not a viable or credible means of teaching and learning.

Another useful means of gauging how popular certain topics seem to be with scholars and practitioners is to review presentations at major national and international distance education conferences. A number of these papers eventually find their way into the literature, and can thus serve as indicators of what issues and ideas are gaining greater currency. An examination was conducted of titles and abstracts of papers presented at selected conferences and research workshops. Not unexpectedly, the theme of distance education management was conspicuously thin. The programs for the 2004, 2006, and 2008 European Distance Education Network (EDEN) research workshops, which attract a significant number of major scholars from throughout the world, did not include any papers directly related to management or leadership. A similar content analysis of proceedings of later EDEN workshops (2012, 2014, 2016) and EDEN annual conferences (2013, 2015, 2017), with several hundred papers presented, revealed only two papers with titles indicating a focus on leadership-related issues. But it is worth noting that West Georgia State University, in addition to publishing the *Online Journal of Distance Learning Administration*, sponsors the only professional annual meeting in the United States that focuses primarily on distance education administration.

The increasing availability of new books on distance education does occasionally offer a chapter or two on aspects of administration and organization. An examination of new titles on open and distance learning received by this author during his five-year tenure (2005–2010) as book review editor for *The American Journal of Distance Education* yielded few titles dealing primarily with organizing and leading distance education activities. While some books do offer a chapter related to leadership, these are conspicuous precisely because they are so infrequent. A closer examination of content revealed discussions regarding the challenges of implementing a particular program at a specific institution, supported largely by anecdotal data, and providing little insight into how those experiences might be applied to other settings. Yet, it is encouraging to see some content that alludes more explicitly to leadership. A review of selected databases on open/distance education publications list a few book titles devoted to management-related topics. While these works mainly offer strategies for developing and directing open learning initiatives, rather than formulating theoretical constructs, the material does help fill the lacuna in the literature on leadership practice.

Several books published within the last decade or so are worth noting briefly. Prominent among these, of course, is this ambitious volume, the *Handbook of Distance Education*; each subsequent edition (2003, 2007, 2012, as well as this fourth edition), contains a substantial section on administration and management. The several chapters included offer a wide range of topics from planning to accreditation, with all having implications for those responsible for leading distance education programs. Hanna and Latchem's *Leadership and Management in Open and Flexible Learning* (2001) is an especially insightful book offering interesting insights on leadership presented through case studies and interviews. Burge's *Flexible Higher Education-Reflections from Expert Experience* (2007) provides a thoughtful perspective on the development of distance education based on the reflections of 44 "pioneers" who have played leadership roles in the field. Moore and Kearsley, in the third edition of their work on a systems view of online learning (2012), include expanded sections on organizational change and policy useful to distance education decision makers in increasingly global and commercialized settings. This author's work, *Reflections on Research, Faculty and Leadership in Distance Education*

(Beaudoin, 2004) contains several essays on distance education leadership, relating to both research and practice that chronicle the author's evolving perspective over a 15-year period. Other useful works with an emphasis on change include: *Learners in a Changing Learning Landscape*, (Visser and Visser-Valafrey, eds., 2008*); Society and Technological Change*, (Volti, 2005); and *Managing Technological Change* (Bates, 1999).

It should be recognized that there is a significant body of literature covering a broad spectrum of leadership, applicable to varied settings and situations, much of which can be appropriately applied to the domain of distance education (e.g., Fullan's *Leading in a Culture of Change* (2001) and Kotter's *Leading Change* (1996), Those now involved in or aspiring to leadership roles in distance education would be remiss not to investigate these more generic sources for information and ideas that are quite germane to their milieu, including older work that persists as seminal sources (e.g., Bass' *Leadership and performance beyond expectations* [1985], and Bennis and Nanus' *Leaders: The strategies for taking charge* [1985]). Of particular note is Donald Schon's *The reflective practitioner: How professionals think in action* (1983). Schon makes a compelling case for developing mature practitioners by encouraging them to actively engage in a process of continuous and systematic reflection of their work. This is an especially worthwhile process for seasoned distance education practitioners; by engaging in "reflection in action," they have the opportunity, as Schon aptly describes it, to define new truths, not only for their own benefit, but also for the next generation of leaders.

In summing up this brief review of research, writing, and presentations on leadership, it can be stated that much of this work is largely descriptive (e.g., case studies) of specific programs. Yet, lingering questions remain: just how useful is this reportage in improving practice, how significant is the body of work to date in contributing to leadership theory, and what is its impact on distance education in general? The modest corpus of scholarly work related to leadership in distance education is compensated for, to some extent, by material in other areas of educational theory and practice. It is perhaps within the arena most closely aligned with distance education (i.e., adult and continuing education) that we can find a well-developed knowledge base relating to the planning, management, and leadership of continuing education activities. Simerly (1987), for example, has contributed a number of worthwhile studies related to continuing education that can be instructive to distance educators.

Recognizing that the relative paucity of material noted in the publications and presentations searched during the decade or so of the first three editions of this *Handbook*, this author undertook another cursory search for published work related to distance education leadership in preparing the chapter for this fourth edition. A perusal of more recently published journals again revealed few articles making any explicit reference to distance education leadership topics, though certainly some pieces do address administrative aspects. Also searched were bibliographies compiled and catalogued as references on leadership in distance education. At first glance, these seem somewhat promising, yet even more recent tittles (2012–2016) covering a variety of topics relating to the planning, management, and evaluation of online education, almost no index listings with keywords such as leadership, transformative change, or the like can be readily discerned. Finally, a focused search of the most recent books containing previously unpublished writing primarily on leadership in the field produced only a single volume (Miller et al., 2013). It is somewhat disheartening, when one does encounter work in this domain, to note that it seems to be the same half-dozen or so authors who are actively researching and writing about leadership, especially considering the widespread popularity of online courses and the development of many new programs that presumably should invite strong interest in this aspect of practice.

The Leadership Imperative

One might be tempted to conclude that the subject of leadership in distance education is being repeatedly overlooked in favor of the usual fare—reports and case studies of specific projects and

programs that delve with detail into enrollment numbers, technology applications, and the like of particular initiatives at selected institutions, and these accounts seldom offer any useful insights about distance education practice that might be generalized for potential application in other comparable settings—and almost never is there any thoughtful analysis about the importance of leadership, or the lack of it, in affecting the outcomes chronicled in such studies. What might be plausible explanations for the ongoing minimal interest in this area of study while in other organizational settings, most notably the for-profit corporate sector, there is enormous interest in topics related to organizational leadership, as seen in best-selling books and high-priced seminars?

First, those researching and writing in the field may just now be getting beyond the phase in its history where there has been an inordinate amount of interest focused on analyses of how distance instruction compares with more conventional methods and, as new technologies were rapidly deployed, how effectively these various learning environments worked compared to one another. A related factor may be that most who have written in the field thus far have themselves been academics that have preferred to devote their writing to pedagogical issues rather than administrative matters. Second, although there has been, in fact, some attention given to the planning and administration of distance education programs for quite some time, most of this work has been confined to accounts of specific case histories, eschewing the more esoteric domain of leadership. Related to this is the fact that, until relatively recently, the concept of "leadership" has not widely been recognized as a separate and distinct aspect of management practice or theory. This seems to be especially so in the education sector, where leadership is seldom alluded to as a discrete topic for analysis, other than supervision and human resources management. Third, there are those who simply dismiss the concept as one that is not especially useful for advancing the study or practice of distance education. It can be viewed as an elusive concept that does not readily lend itself to reliable analysis, or to a set of behaviors applicable to the particulars of each situation. Further, just as some argue that there are no characteristics attributable to distance education that are uniquely its own within the field, they likewise believe that the concept of leadership within distance education merits no special scrutiny or analysis as a discrete area of inquiry. Nonetheless, leadership-related research and writing, though relatively modest in quantity to this point, is generally of solid quality, and is making a worthwhile contribution to distance education scholarship.

What, ultimately, is the usefulness of the body of work generated thus far on the subject of distance education leadership? The research and writing produced to date that is available in books, book chapters, conference presentation, journal articles, survey reports, and occasionally in the popular press, does offer distance educators currently engaged in, or aspiring to, leadership roles with a variety of resources to guide their practice. Assuming that there is some value in this emerging focus, what can be done to generate more interest in the topic? At the very least, those planning publications and meetings related to distance education could actively solicit contributions on leadership-related topics, and, as is beginning to be in evidence, even dedicate entire conferences, journal issues, or books to the topic.

There is value, particularly at a time when distance education has achieved credible progress in attempting to craft if not a definitive theoretical framework for leadership practice that is unique to distance education, then at least a set of guiding principles that can usefully serve its providers and consumers. Those responsible for mapping new directions for moving distance education to the next stage of its development should be heartened by the efforts of several professional associations and accrediting bodies in articulating and promulgating "principles of good practice." Nearly 20 years ago, the New England Association of Schools and Colleges developed a "policy for the accreditation of academic degree and certificate programs offered through distance education" (1998). These quality standards have been useful in providing suggested criteria by which new programs can be planned, in assessing what has been done in such areas as matching technology with needs, providing adequate student support, implementing appropriate evaluation measures, etc. In the absence of

a more precisely formulated theoretical framework, such principles offer worthwhile insights about what constitutes effective leadership practice, and how it ultimately impacts the success or failure of institutional efforts in this arena. These guidelines, if constructed with the benefit of solid theoretical foundations, performance standards, and measurable results, are certainly more effective than simple checklists of helpful hints about what to do and what not to do. Black (2003), for example, offers a sound set of thoughtful questions intended for institutional leaders and decision makers to use in appraising organizational readiness in order to guide their efforts at planned change.

Beyond a familiarity with research and writing, other activities can yield useful information and insights that compensate for somewhat limited scholarship on distance education leadership. Academic offerings (e.g., degree programs, symposia, workshops, summer institutes, and other professional development activities, especially those including attention to leadership) can contribute to greater awareness and understanding of this critical area of practice. A number of institutions offer certificate and graduate programs of study with curricula in distance education, including courses specifically designed to prepare leaders for the field (e.g., Master of Distance Education, University of Maryland University College, and certificate programs offered by University of Wisconsin-Madison and West Georgia State University. It is interesting to speculate about what impact such academic programs might eventually have in creating a distinct body of work that offers a more theoretical approach regarding leadership. Preparing candidates for careers specifically in distance education through professional education programs has potentially significant implications as, for the first time, the field is now acquiring a new generation of individuals in leadership roles who did not "come up through the ranks" during a period when the field was just emerging as a recognizable and viable area of professional practice. In addition to introducing new leadership styles and strategies in the field, this cohort will hopefully contribute important new theoretical perspectives as they develop into mature practitioners and reflective scholars.

Leadership Roles and Competencies

Being well into a new millennium during which the promise of ever-advancing technologies presents new challenges as well as opportunities, it is worthwhile to ask if there are any particular leadership styles, roles, or competencies that are especially appropriate and effective within the distance education arena. While it may be too bold to suggest a single best approach, it is useful to identify those situations in which distance education leaders typically find themselves, and to consider strategic perspectives that might be most compatible and productive in those settings. These include collaborative partnerships such as alliance building with for-profit companies, meta-university arrangements whereby networking structures can overcome parochial interests, new markets that expand beyond one's immediate environs, and free-standing virtual entities utilizing asynchronous formats rather than hybrid delivery systems. These would seem to be a few venues in which there is an increasing need for high performing leaders.

Leaders must create conditions conducive to energy, initiative, and innovation in their particular milieu, and bring others along, both above and below them in the organizational hierarchy. The prerequisite for this transformative leadership approach is what Hersey, Johnson, and Blanchard (2001) call "situational" leadership (i.e., the ability to diagnose the organization at a particular moment and determine its stakeholders' readiness for moving in a new direction). In this mode, the leader assesses the unique situation in the immediate environment, and then moves the status quo as far along the change continuum as necessary, in concert with stakeholders. The need for keen diagnostic skills among organizational leaders becomes more urgent in fields such as distance education, wherein technological resources are critical for success, and are in a constant state of transience. This dynamic environment fosters chronic change as a reality of organizational life, and thus demands decision making based on current conditions while being aware that whatever stimulus might be introduced

into a setting could likely be displaced by new options at any time. Indeed, technological transience is both a threat and an opportunity, but it is the management of change rather than of technology that is crucial to individual and institutional success.

Advocates and initiators of distance education should no longer be seen, nor view themselves as mavericks on the fringes of their institutions, but rather as contributors who can play a key role in bringing their institutions to the next stage of organizational development. This new status among those responsible for "alternative" programs is now increasingly accepted, prompting some institutional decision makers to become more aware that their prevailing style may no longer be as responsive and relevant to the expectations of new learners seeking greater access to educational opportunities. Distance educators must capitalize on their institution's growing need to remain competitive in a broadening arena by emphasizing how new delivery systems, once relegated to the margins, are now increasingly critical to the institution's strategic planning for greater success and, in some cases, perhaps even survival. And while some might object to the notion of appealing to an organization's self-interest as a means of advancing distance education, the reality is that an innovative new idea very often succeeds, not because it is noble, but because it can serve a valuable purpose for a provider, as well as its users.

Because few distance educators have the opportunity to create entirely new free-standing entities exclusively designed for online delivery modes, but rather labor within institutions positioned somewhere along the continuum between conventional and alternative systems, most eventually face the conundrum of whether or not to promote the notion of a central unit to foster and sustain distance education initiatives and activities. One argument is that without a focal point for such endeavors, individual faculty members will likely tinker indefinitely and inefficiently on their own with a variety of instructional technology options primarily intended to augment their classroom-based courses, an approach unlikely to result in a system-wide adoption of distance education in any comprehensive and cost-effective manner. Some institutions that do eventually incorporate small-scale distance education initiatives contract for certain specialized functions that allow them to retain their existing infrastructure; this arrangement enables them to be involved in distance education at some level, but may also preclude acquiring any real expertise, or making any fundamental institutional shift in new directions. While such an arrangement might expose an institution to the potential benefits of online education, it may just as likely tempt it to retain its primary focus on traditional academic programs and practices, while any distance education initiatives remain largely peripheral and incidental.

A more optimistic perspective is that an incremental process of online initiatives, however modest, might become increasingly prevalent within an institution and eventually lead to a critical mass of participants, thus creating a demand for a stronger institutional commitment in this direction. Proponents of this more measured approach maintain that it is the pattern that has typified most institutions' progression into the distance education arena, and that more aggressive administratively driven initiatives will only generate further faculty resistance and impede prospects for longer-term change. Bernath (1996) provides interesting insights into this dilemma, citing various European models to illustrate the positive and negative forces at play when attempting to integrate distance education into conventional universities. For opinion leaders in distance education, this particular issue can be one of the most vexing, but growing experience and insights will enhance their credibility and influence within their organizations and beyond. Burge (2007) effectively captures this phenomenon through the reflections and insights of 44 pioneers who fostered changes in higher education via distance education.

To succeed in any of these contexts, a macro view is critical. Distance education leaders cannot afford to be overly preoccupied with nurturing their own programs and providing the impetus for just their own initiatives. They must also insinuate themselves into the academic mainstream and the inner circle of decision makers responsible for bringing the entire organization to a new place. Bass

(1985) advocates a holistic and interdisciplinary approach to leadership to achieve truly transformational change. Yet, many distance education initiatives, even successful ones, are often developed largely in isolation, and so remain an anomaly within the broader institutional setting. To achieve their more parochial goals, such leaders typically utilize a transactional style to gain support, or at least minimize resistance, before attempting a bolder collaborative agenda, in hopes of influencing wider organizational change. Distance educators should not see themselves as protectors of isolated programs, but rather as valuable strategic partners who can embolden their institution to emulate their successes. In short, distance education managers must see themselves, and be seen, as educational leaders who encourage the development, implementation, and stewardship of innovative teaching and learning to be shared with and supported by the wider academic community.

Still, leaders must disabuse themselves of the notion that their programs, however more widely accepted within their institutions than previously, are now seen as the precursors of large-scale innovation. It is more likely that, in most instances, these alternative delivery methods are finally recognized as effective means of capturing a larger market share of new consumers that will generate additional revenues. Distance educators can be potential advocates for shaping new agendas because colleges and universities, now more than ever, must plan their futures in a context of uncertainty brought about by the rapid emergence and evolution of instructional technology, by higher costs and diminished resources, and by more aggressive competitors. Much of higher education is still characterized by "old millennium" thinking that has functioned for a long time in a traditional mindset (e.g., decisions regarding the number of sections required for a particular course made on the basis of cost-effective faculty workloads). In the new economy, wherein information can be delivered to a broader market in less time and at lower cost, distance education activists must help their institutions pose the right questions and seek to cultivate an appropriate niche through "new millennium" thinking.

The challenges facing higher education—even those with experienced and effective leadership—are formidable, especially when organizations remain stubbornly resistant to change, even as exciting opportunities present themselves (e.g., despite online access to much of the world's lucrative foreign student market, most universities remain uninterested or uninvolved, except perhaps for the traditional semester abroad or exchange program with relatively modest numbers). If their institutions choose to remain unresponsive, are there particular leadership roles and styles that are especially relevant now? Distance education opinion leaders must persistently convey a sense of urgency that new options they are pursuing, even if currently serving only a small proportion of overall enrollments, represents a model for replication elsewhere in the organization to achieve the goal of further growth and success. But this requires that distance education successes be documented and disseminated, and that benefits be touted. This is already happening in such areas as instructional design, whereby many faculty members may be unaware of just how much learning from a distance is taking place through their own institution, but are nonetheless eager to acquire new technology tools and training to augment their own classroom-based courses. In an earlier era, distance educators often assumed a warrior mentality to advance their cause; today, they can probably be more effective as brokers facilitating the expansion and replication of programs and services for which they had to forcefully advocate in earlier more contentious times.

Arguably less critical in the repertoire of today's distance education leaders are the roles of advocate, reformer, and technician that occupied so much time and energy in the past. Too often, institutional decision makers' deliberations are long on technological options, but bereft of fundamental pedagogical questions. Leaders in this field, regardless of whatever other roles they may assume, must always maintain the essential task of educator. This is not to suggest, however, that they need not be attentive to the technological side of the enterprise. Indeed, keen attention to the medium is critical, but as Neil Postman (1996) insightfully points out, it is not so much knowledge of how technology works as it is how technology impacts its users. Every new technological innovation

applied to education at a distance changes the dynamics. These changes may be in the intellectual, social, political, economic, or ecological domain, and the effective leader cannot afford to be ignorant of the advantages and also the possible disadvantages of what innovative technology introduces into their environment.

So, what skills are especially critical to those responsible for advancing and sustaining distance education initiatives? Are there certain competencies that those in leadership roles should possess to be most effective, especially in settings characterized by chronic change? Klein, Spector, Grabowski, & de la Teja (2004) define competencies as "a set of related knowledge, skills, and attitudes that enable an individual to effectively perform the activities of a given occupation . . . [or a learner] to the standards expected in employment [or for learning" (p. 14). Among key competencies distance education leaders should ideally possess are:

- Managing change processes that maximize opportunity and minimize disruption.
- Accurately diagnosing situations and devising appropriate strategies for intervention.
- Creating conditions for innovation via a transformative leadership style.
- Maintaining resilience and perspective in times of glacial or precipitous change.
- Mentoring the next generation of distance educators.
- Bridging the digital divide, especially in cross-cultural settings.
- Maintaining a meaningful role for instructors in student-directed learning.
- Promoting a climate of ethical behavior among both providers and consumers.

Transformative Leadership: Disruptive or Innovative?

Regardless of a leader's repertoire of attitudes and attributes, it is the process of transformative change that ideally guides one's practice. The notion of transformative leadership, advocated more than 30 years ago by Bennis and Nanus (1985), is a particularly compelling model for distance education leaders today, as in past eras. This is because long-entrenched practices may require reshaping to adapt to new realities. Transformational leaders in education must be capable of helping stakeholders (e.g., administrators, faculty, students, trustees), recognize that there are attractive benefits in doing business in new ways, and recognize that they can no longer afford the luxury of adopting alternatives to conventional teaching and learning in a cautious and incremental fashion, which most academics are so accustomed to doing. A climate less resistant to change and more receptive to innovation must be fostered, as the setting and those within it are subject to a series of accelerated transitions, inevitably demanding a more transformative perspective of the world around them. Irlbeck (2002) and Portugal (2006), among others, have argued that a transformational leadership approach is especially effective in distance education settings. Certainly, there are no facile formulae that can be matched with particular contexts that will ensure infallible leadership performance, but a sense of vision, resoluteness, and the ability to articulate ideas and goals are, at the very least, prerequisites for advancing ambitious and innovative goals.

Clayton Christensen, in his influential work on innovation and its consequences, points out the irony of many successful organization with effective leaders that are among those most resistant to change simply because they are convinced they already are engaged in avant-garde practices, having introduced innovations before others did, yielding profit and prestige. If so, what then is the incentive or rationale for contemplating any further change? Christensen refers to this tension between the opportunity and threat of planned change as the "innovator's dilemma" as reflected in the title of his work (1997). His notion of disruptive technology is instructive, particularly within the context of higher education Christensen and Eyring (2011), best evidenced in its use of digital devices and learning management systems designed to make teaching and learning possible at any time and any place. He points out, not surprisingly, that the Internet is a technology that has fostered progress as

well as disruption in higher education, with its established classroom-based instruction often competing with newly introduced technology-driven offerings. As this tension frequently characterizes the realm in which so many distance educators function, they would do well to understand and manage the dynamics of disruption. Christensen makes the distinction between disruptive innovation and sustaining innovation. Introducing any authentic innovation is likely to be disruptive to some degree, and leadership's ultimate challenge is to "institutionalize" it to become a sustaining innovation. Even well managed organizations may falter because they attempt to incorporate new technology in order to attract emerging markets with enhanced products and services, but then lose their position of strength with their existing clientele. Some decisions may appear strategic to improve performance and ultimately achieve greater success, yet might be overly risky and disruptive in the short term. This dilemma is a perennial occupational hazard for any ambitious distance education decision maker. Christensen notes that disruptive innovation can be especially challenging to reconcile in higher education due to competition from the for-profit education sector that has created a new sense of urgency. He notes the irony in the fact that although the college experience can be transformative for so many, learning organizations still persist in being inherently resistant to transforming themselves. Though it is difficult to abandon a model that has changed little in the past 150 years, if this sector now embraces learning innovations made possible by new technology, Christensen contends, online learning can be truly transformative and create opportunities for universities to not only serve more students, but also lead the larger population to greater prosperity.

Organizational leaders and program heads exploring opportunities for change must recognize what practices are effective in which situations under what conditions, in order to minimize the prospect of disruption, whether it creates a minor setback or catastrophic event. Issues such as market demand, availability of resources, appropriate technology, and the like can all confound the choices to be made. If a university infrastructure is tailored to compete in a certain market (e.g., full-time residential students), it is difficult to be equally competitive in an entirely different one (e.g., part-time working adult learners seeking convenient and flexible course scheduling), especially if new systems need to be designed and implemented. Christensen argues that creating a different organization may be the only way to achieve profit and success and avoid disruptive innovation. If a new resource (e.g., an online course delivery system) is incompatible with the needs of an institution's mainstream clientele, then that option is likely to be perceived by current providers and consumers as a threat rather than an opportunity. Stakeholders within the current system will likely have little tolerance for failure, making a perceived risk unpalatable. For this reason alone, many educational providers eschew opportunities to implement even relatively modest distance education initiatives, and so the status quo prevails. The competing dynamics between disruptive and sustaining technologies requires leaders with the capacity to resolve those tensions and create a context and culture in which, and by which, the differing challenges faced by innovators become less of a dilemma and more of an impetus for productive and meaningful change.

Conundrums in decision making by leaders engaged in online education are further exacerbated by the relentless shift and volatility of trends especially acute within their environment (e.g., when a particular instructional technology resource, such as a learning management system, currently in vogue, is suddenly displaced by a newly released version). Trends that have become widely accepted can fade rapidly, resulting in unanticipated consequences and requiring uncomfortable adjustments. Howell, Williams and Lindsay (2003) identified key trends in distance education that have impacted the field in the United States, including: (a) existing institutional infrastructure that cannot easily accommodate new demands; (b) instruction that has become more learner-centered, requiring new modes of delivery; (c) increasing educational outsourcing and partnerships; (d) ubiquitous application of digital devices, making near universal technological fluency a required competency; (e) more intense competition for new markets and diminishing resources; and (f) a greater need for teaching strategies that exploit available technologies.

The changing learner landscape has forced added attention to areas which many institutions have long taken for granted, assuming that prevailing means of doing business could remain intact for decades. But new realities have demanded greater productivity, economies of scale, aggressive resource mobilization, an intense focus on quality control, and increased attention to competition—all priorities that many institutions did not possess adequate expertise needed to respond to in an efficient and timely fashion. These challenges could not be ignored, and were exacerbated by a more diverse and demanding clientele choosing educational providers on the basis of convenience and price rather than geography and prestige. These new conditions have prompted some institutions to respond by reinventing themselves, by creating entirely new entities, or integrating new elements into existing modalities, and reducing costs without sacrificing quality or reputation. Several smaller institutions hesitantly entered the distance education arena to survive. Others, at their peril, resisted making any substantive changes, preferring to rely on their traditional modes and markets for continued success; some ultimately did not survive.

Conclusion

Many institutions thrive on preserving traditional practices, rather than fostering technology-enhanced pedagogy. When they do finally recognize that new initiatives are not likely to threaten their legacy and legitimacy, they often lack any viable mechanisms useful in effectively contributing to systematic change. And as previously noted, committing to the brave new world of distance education is not so much about selecting appropriate technology; rather, it involves asking the right questions about the consequences of desired changes. This process requires that leaders articulate and arrive at an inspirational and doable mission for their organization, empower and energize followers to implement that mission, be aware of their various stakeholders' values and needs, integrate congruent values into the organizational culture with minimum disruption and resistance, and press their institutions to improve continuously and ethically.

Impressive gains have been made by distance educators in promulgating technology-assisted teaching and learning in its varied modes; sometimes this process has occurred relatively smoothly, while in other settings with clashing cultures, it has been a struggle. Can we state with confidence that innovative technology has moved from being a disruptive force to a sustaining presence, and that the academy has undergone a genuine transformation? Perhaps such an assertion is still somewhat premature, but certainly we can affirm that a generation of distance education leaders and adopters have achieved significant change in many institutional settings, and that this phenomenon has created favorable conditions for further sustainable progress. And yet, though we can tout many encouraging advances, are we perhaps witnessing just a veneer of instructional technology being overlain on conventional systems and practices that ultimately produces little fundamental change? This question has persisted as both conundrum and challenge, not only for early pioneers in the field, but for distance education leaders to the present day. Hanna (2007) states that although dramatic changes are occurring in higher education, many driven by distance education, it remains elusive as to whether or not transformational change has or will ultimately occur. Ayers (2008) maintains that historical principles of academe remain largely intact because of conflicting cultures (e.g., the academy values physical place and stability, distance education emphasizes mobility and change).

The "institutionalization" of distance education will not become a reality without appropriate and continuous institutional leadership. And while decision makers need not be experts in this field, they must at least recognize the potential of online education for their institutions and be willing to create the conditions for innovation in this direction. This will best happen if they demonstrate transformative leadership. Yet, typically, campus leaders ascend to senior roles via a largely transactional style that is focused more on building relationships within the existing environment than on promoting bold action that transforms their institution and brings it to a new place. If there is any

area of engagement that requires genuine transformative leadership in higher education, it is in the continuous advancement of online education, not to supplant face-to-face instruction, but rather to complement and enrich conventional pedagogy.

For meaningful and sustainable transformation to ultimately occur, both veteran and emerging leaders must be prepared for and committed to the roles and strategies we have described. They must rely not simply on instinct or anecdotes derived from past experience, but also benefit from new insights informed by valid data and reliable diagnoses. They must devote greater attention to leadership as a discrete area of study and practice to achieve the important goals ahead. The continuing contributions of distance education leaders demands a clear vision of where we want to go and how we must lead others to that place. Despite all that has already been realized in this exciting field, it cannot be ignored that distance education still remains an anomaly on many campuses, and its practice is still considered an alternative to mainstream education. It is those with vision able to articulate, advocate, and operationalize these goals who will ultimately make their organizations relevant for the digital age and for all citizens in the United States and beyond who now live in a complex global community. This ongoing challenge cannot be adequately addressed unless we understand the issues, engage in competent practice, and benefit from strong leadership at both program and institutional levels. The work in which we are engaged is too important, and the opportunities it presents to the next generation of providers and users is too critical not to rise to the challenges ahead with the same resolve and success exhibited by those who proceeded us.

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NEEDS ASSESSMENT AND STRATEGIC PLANNING IN DISTANCE EDUCATION

Ray Schroeder and Vickie S. Cook

Introduction

Until recently, online learning initiatives were not strategically well developed. They were programs that were built by operational leaders who were encouraged to be innovative and creative in design and approach, yet they were not commonly integrated into university-wide strategic planning. With the growing importance of distance learning in higher education, strategic leadership in this area is now demanded by higher education leaders. We will discuss some of the processes that online leaders must be able to develop to successfully lead a distance education initiative while also leading both internal and external constituents in the distance education endeavor.

Trends in Distance Learning

One cannot develop a strategic plan in a vacuum; it must be planted in the context of today and based on the trends and changes that are emerging to shape the future. This is certainly no truer than in the field of distance education which is rapidly changing in this first quarter of the 21st century. Contexts to consider are those of higher education, societal needs (e.g., employers and the workforce), and technologies.

The overriding trend in education more than ever before is to respond to workforce needs. Clayton Christensen, the Harvard Business School professor known for his theory of disruption, has released a new theory based on the "job to be done." In *Competing against Luck* (Christensen, Dillon, Hall, & Duncan 2016), the authors firmly establishes the link between student expectations and higher education. By asking "what do students hire universities to do?" the authors comes up with what parents and students alike already knew: they want a streamlined, economical pathway to a rewarding career.

The asynchronous online pathway gives the greatest flexibility and accessibility to classes. Classes are available just about anywhere at any time. There are the built-in benefits of the economy in time efficiencies, commuting, and caregiving (when relevant) expenses. The importance of these factors is borne out in that while we have seen an overall decline in college registrations over the past five years (Allen, I.E., Seaman,J, 2017), we have seen a continuing increase in the numbers enrolled in online programs (Dietrich, 2016).

Broadly in higher education, the focus is on linking learning to jobs (Zalaznick, 2017), with even the suggestion that Linkedin may become a prominent learning provider, as well as the

employer connector that it already is. The trends are toward improved and enhanced distance learning (Brown, 2017). Nontraditional degrees and certifications (e.g., edX's MicroMaster's) and nontraditional students will combine to leverage new opportunities to reinvent higher education (Stansbury, 2017).

The long-running series of predictions of the New Media Consortium (Adams et al., 2017), in its annual Horizon report, encourage consideration of rethinking the role of educators to leverage the emerging technologies providing customized and even competency-based learning opportunities to meet workforce needs. The developing technologies of adaptive and mobile learning, combined with artificial intelligence, are predicted by the NMC to facilitate the continued movement of higher education online, further enabling distance learning.

It is in the mix of these trends and contexts that we see distance learning becoming even more important to the future of higher education, making strategic planning in this area a high priority for many institutions.

Hallmarks of Excellence in Online Leadership Framework

Strategic planning is built on strategic thinking (Bates & Sangrà, 2011). To that end, a team of eight national leaders in the field of online learning developed the UPCEA Hallmarks of Excellence in Online Leadership (Halfond et al., 2015). The Hallmarks were developed through a strategic thinking process to build enthusiasm and idealism into the young field of online learning, a subset of the more established distance learning field. It was noted that many leaders in the field of online learning today were first-generation leaders who were in need of a framework to lead this initiative effectively within their institutions. The Hallmarks have been accepted across our field as the aspirational goals for distance learning.

The Hallmarks have been formally vetted by leading institutions and national associations in higher education (www.upcea.edu/hallmarks). Review and endorsement of this framework has been provided by the most comprehensive and prestigious associations in the field of higher education:

- The American Council on Education, self-described as the major coordinating body for the nation's colleges and universities represented by some 1,800 college and university presidents and chief executives of related associations. www.acenet.edu/about-ace/Pages/default.aspx
- EDUCAUSE, the leading information technology association representing those who lead, manage, and use IT in higher education. With more than 1,900 member colleges and universities and an additional 350 corporations and associations, EDUCAUSE has thoroughly reviewed, contributed to, and endorsed the Hallmarks. www.educause.edu/about
- Founded in 1940, and representing more than 11,000 academic and research librarians and associated others, the Association of College and Research Libraries reviewed and formally endorsed the Hallmarks. www.ala.org/acrl/aboutacrl
- The leading association of chief financial and business officers from more than 2,100 universities, NACUBO, also reviewed and endorsed the Hallmarks. www.nacubo.org/About_NACUBO.html
- Similarly, the National Association of Student Affairs Administrators in Higher Education (NASPA), representing 15,000 members across the country, reviewed and endorsed the Hallmarks. www.naspa.org/about
- Other related associations and entities, including MERLOT, the Multimedia Educational Resource for Learning and Online Teaching (www.merlot.org/merlot/index.htm) and Quality Matters, committed to quality assurance in online education (www.qualitymatters.org/why-quality-matters/about-qm), have also reviewed and given their formal endorsement to the Hallmarks.

The authors of the Hallmarks of Excellence in Online Learning identified seven broad and essential aspects of leadership and organizational development within online leadership that were crucial to institutional success. These seven constructs are briefly outlined below.

Internal Advocacy

Online education is an integrated component of the institution. Those charged with leading online learning must find natural alliances, build strong partnerships across the university, and understand and support the vision, mission, and strategic plan of the institution.

Entrepreneurial Initiative

Online education allows an institution the capacity for innovation and requires some level of experimentation and risk. Emerging leaders must subscribe developing skills to take risks, utilize imagination, and develop change management skills at the highest level.

Faculty Support

Faculty support is a critical component of the instructional process. Faculty support also requires attention and support from online leaders who provide resources and tools for faculty to embrace high-quality teaching in an ever-changing format.

Student Support

All components of online learning should be centered on the needs of the student. Online leaders must create processes and connections for online students that allow students to achieve a high level of success through a high-quality rigorous learning environment.

Digital Technology

Digital technology is often included in distance education strategic planning and needs assessments. However, in order to truly delivery online learning at the highest quality, a complete review of current and emerging trends in digital technologies is needed. Technologies must seamlessly integrate with the learning environment, and not create barriers for faculty and students who are utilizing digital learning methodology.

External Advocacy

Online learning leaders must strategically situation themselves and their institutions among the competition. Remaining relevant within the market requires a strategic approach to interactions with accreditations, alumni, business community leaders, members of the media, and other institutions.

Professionalism

Creation of a highly professional approach to every person, every day, in every interaction demonstrates the integrity of online leadership. Creating a strategic approach to all professional interactions both internally and externally contribute to the field of online learning.

In 2016, UPCEA once again led the effort to have a team of 14 national online leaders provide guidance in the development of an assessment tool. The assessment tool was designed based on

the Capability Maturity Model originally developed by Carnegie Mellon University as a tool for objectively assessing processes to implement software projects for government contractors ("Capability Maturity Model Integration Overview Version 1.2," 2007). The framework for the assessment of institutional capability was developed and tested by a pilot group of institutions. The assessment measures are currently being benchmarked in a nationwide study.

The Hallmarks of Excellence in Online Leadership provide the most widely endorsed, substantive effort in defining strong strategic approaches to distance learning including the assessment of institutional leadership in these pursuits. They create the framework for our discussion of implementation areas to be considered in effective distance learning strategic planning.

Strategic Plan Processes

Strategic planning is a process that, when done well, includes stakeholders both internal and external to the organization. Strategic planning is guided by the strategic thinking process that begins with institutional mission alignment. One approach to determining strategic alignment might begin with a simple exercise identified by Daniel Pink (2017). The activity is a simple one-sentence response to the question, "what is the purpose of the organization?" Starting a strategic planning process with this simple but effective organizational checkup will help those leading the strategic planning process. Beginning with the understood mission of the organization will assist the stakeholders with more effective participation with the processes of strategic planning. The mission of any organization should be articulated well, but also communicated well on a frequent basis (Bersin, 2016).

Assessment is critical to the strategic planning process. Assessing the process, the plan, and the data throughout the process is key to creating a strong plan. There are many tools available for assessing a strategic plan and its corresponding processes. Assessment tools (such as Strengths, Weaknesses, Opportunities and Threat (SWOT) analysis) may be misunderstood as the strategic planning process. However, SWOT, as many other tools, are simply instruments to be utilized in building a strategic plan—not the plan itself. Use of the SWOT as a tool or another data collection tool during the assessment process provides a baseline of data to determine where the institution currently is on the continuum of strategic initiatives. This baseline data is critical to determining the direction the institution should take.

Constituencies lead the strategic plan toward implementation and sustainability. Stakeholders who understand the purpose of the organization and align the planning process to that purpose effectively assist with the development and writing of the strategic plan to move the institution forward.

Budget alignment is a critical piece of the strategic planning process. Many institutions plan without specific connection between the actual budget and the initiatives identified or prioritized. In today's economy, this type of siloed approach to strategic planning is unsustainable.

The term of any plan dealing with higher education in general and specifically with the distance education field should be nimble and revaluated regularly. A beginning term of 3–5 years allows enough time for a plan to be carried out, but not too much time for renewal and regular evaluation to occur.

Strategic plans within the higher education field should not be a surprise to any of the constituents. All approvals and communications with various governance bodies must be included in the overall timeframe to complete the plan. Time for both feedback and general comment periods are needed to ensure the plan addresses the concerns of constituents.

An evaluation schedule should be established as the plan is created. The evaluation should include both the initial assessment of current products and processes, as well as a reevaluation schedule. Should the plan be reevaluated annually or biannually? How should reports to constituents and stakeholders be made on both the implementation and the operationalizing of the plan?



Figure 24.1 Logic model for strategic planning

Source: Cook and Schroeder (2017), unpublished

Leadership Areas—Focus—Vision

Internal Advocacy

Recognizing that distance education, by its very nature, will be an integrated and extensive facet of the university, those charged with planning for the enterprise must build internal alliances and reflect the larger goals, values, and strategies of their institutions. It is important to assure that distance learning "fits" into the overall structure and mission of the university. This is best done through thoughtful, responsive, and engaging leadership.

In the planning process, we must go about identifying the locus of beneficiaries and support for distance learning. In part, these may include departments and colleges that can easily benefit by serving distant students. At the core of this activity is listening to the stakeholders: administrators, students (and prospective students), staff, and faculty members. Identify the concerns, insecurities, and conflicting priorities that impact the distance learning initiative.

Included in the planning process should be ways to assure that those who serve as advocates are recognized and, where appropriate, rewarded for supporting the distance learning initiative. A plan for continuing communication among those associated with the distance initiative should be provided. One good model for this is the development of a community of practice that includes those individuals and groups, from students to administrators, who support the distance learning program (Wenger-Trayner & Wenger-Trayner, 2015).

It is not enough to rely upon existing areas of advocacy, but it is important to consider the development of leaders at all levels who can envision the growth and innovation that may be accomplished through the program. Such professional development is accomplished through mentorships with more senior staff and through more formal programs such as the Georgetown Institute for Transformational Leadership (http://scs.georgetown.edu/departments/37/institute-for-transformational-leadership/leadership-principles). Faculty leadership is essential at the departmental level, college level, faculty governance, and even union and collective bargaining, where such exist. One approach to cultivating faculty leadership at the University of Illinois Springfield (UIS) is the Center for Online Learning, Research and Service (COLRS) Faculty Fellows program (www.uis.edu/colrs/research/fellows/). This ongoing program serves to cultivate faculty understanding, research in the area, engagement in the field, and, as a result, advocacy for the distance learning program.

Advocacy should be sought at the highest level of the institution to assure that the distance learning "voice" is heard among deans, provost, and chancellor/president. One method that has worked well at the UIS is to create an associate vice chancellor (AVC) for online learning position that is on parity with the AVC for undergraduate studies and the AVC for graduate studies. Reporting directly to the provost, this position joins the dean's council and provost staff meetings. This assures that the interests of the initiative are represented in considerations for the daily decisions made by the university. A strategic plan could well envision the creation of such an administrative position to assure that the program is on the daily agenda of the highest level of those leading academic affairs.

Assessment of Internal Advocacy

To effectively assess the development of internal advocacy in preparation of the strategic plan, one must first articulate a vision of the online learning initiative.

Assessment questions to consider:

1. Is the online learning initiative aligned with:
    a. The institution's mission?
    b. Goals?
    c. Strategic plan?
    d. Budget and financial projections?
2. Are stakeholders engaged with setting the vision for online learning?
3. Are there sufficient structures in place to allow online learning to be successful? If not, what structures are not in place or are deficient?
4. Are data available to make decisions and determine accomplishments?
5. What are the current online degrees available?
6. What is the scalability toward success?

7. Are the current processes in place to allow capacity for all on-campus administrative units (financial aid, admissions, registration and records, library services, student services, tutoring, etc.) to communicate and serve students with high quality?
8. Are processes in place to allow online learning students and online faculty to be considered for institutional academic awards?
9. How are online learning initiative successes measured and celebrated within the institution?

The answers to these and other questions specific to each institution are critical to visioning how internal advocacy should be built or expanded across a campus.

Entrepreneurial Initiative

"Entrepreneurs take risks in envisioning change," Gonzàlez (2017, n.p.) notes, "and Innovators are tasked with change implementation." Change is perhaps one of the most recognizable characteristics of this field. Technologies are changing on a daily basis as mixed reality, artificial intelligence, and media forms mature. In order to best succeed, university distance education programs cannot last long as lagging adopters of new pedagogies and technologies. Neither can they thrive on the bleeding edge. What is needed is a strong base of entrepreneurism that will renew and upgrade the products and delivery modes of distance education.

Entrepreneurism begins with recognizing the challenge and then creating and implementing strategic solutions. Identifying and cultivating entrepreneurship among those engaged in digital learning is crucial to the continuing success in this ever-changing field. Howes (2014 p. 1) suggested that "Entrepreneurs are a different breed of leader. Renegades, rebels, world changers, innovators, black sheep, risk takers, workaholics—these are just a few of the names we are called by both those who love us, and those who don't understand us."

This may seem to be a mixed bag of qualities, but our experience is that the authors have found all of these characteristics embedded within those who support the most successful we have encountered. The strategic plan must be inclusive of those who may be outside the mainstream of thought, but who are the spark plugs for change and innovation.

In strategic planning, the challenge is to assure that entrepreneurs are welcomed and supported; that no idea is dismissed without careful consideration and vetting. Entrepreneurs must not only be welcomed, but the plan should include ways of cultivating new entrepreneurs who are prepared to take the risks of conceptualizing and launching new and innovative programs to distant and underserved audiences.

A special set of leadership characteristics is most important in entrepreneurs. Kevin Daum, a best-selling author in marketing, identifies half a dozen leadership characteristics that we should cultivate or identify in building entrepreneurship: pragmatism, humility, flexibility, authenticity, reinvention, and awareness (2017). These are the personal traits that will enable the entrepreneur to successfully innovate and lead, and they are the ones that we will need to encourage through our strategic plan.

The community of practice is a great place to serve as an incubator of entrepreneurism. In the relatively safe culture of colleagues dedicated to the same overall goals, the emerging entrepreneur may be supported in promising ventures for the university, and gently reminded of flaws in ventures that seem less likely to succeed. Fostered by the community, the entrepreneur can help to the position the university into a leadership position in tapping new markets and growing old ones.

Assessment of Entrepreneurial Initiative

Recognizing that distance education is inevitably about innovation, experimentation, risk, and imagination, entrepreneurship is at the foundation of every distance learning program. Effective leaders

in this area must have the skills and creativity to facilitate responsible change. A component of this facilitation of responsible change is the assessment of the entrepreneurial initiative to effectively plan for future developments.

Assessment questions to consider:

1. Is the online entrepreneurial initiative on track to meet the goals established?
2. Is there a marketing initiative coordinated with the entrepreneurial effort?
3. Is there sufficient infrastructure to allow for the entrepreneurial initiative to occur, and to succeed?
4. Has the entrepreneur increased institutional capacity?
5. How has the institutional brand been undergirded by the effort?
6. Do faculty and staff report positive gains through the initiative?
7. Have new funding opportunities been identified as a result of this initiative?

Faculty Support

Faculty members are the lynchpin of learning. They create the opportunities and bonds that link students, content, and engagement. They represent our institutions and programs to the public. Their support is essential to success in distance learning, and therefore, they must be considered in planning the strategic effort for distance learning.

Data from the National Center for Education Statistics shows that there are more than 1.5 million college faculty members of all ranks and appointments as of 2013. However, over the past 43 years, the percentage of the professoriate that is full time has plummeted from 77% to just over 50%. The number of part-time faculty members has risen from just over 100,000 to more than 750,000 representing very nearly half of all faculty ("Digest of Education Statistics" (2015).

In part, this shift means that faculty members are busier than ever before—the part-timers because they are paid so little, often holding multiple positions at different universities, teaching six or more courses a semester (a dozen or more each year!). They have little time to keep abreast of their field, let alone to learn pedagogy, technology, and effective practices in teaching online. The full-time faculty members are carrying the disproportionate load of faculty committee work, advising, and supporting student activities that had been spread among a relatively larger base years ago. Many of these faculty members shoulder the three-part mission of teaching, researching/publishing, and service based on the Boyer (1990) model. At many institutions, these encompass the criteria for tenure and promotion (Jaschik, 2007); if faculty members are going to preserve their jobs and advance their careers, these are paramount. Once again, this faculty group is far too busy to spare much time for enhancing the quality of their online classes. It is not uncommon to meet faculty resistance in adding or expanding distance programs. Several concerns are commonly voiced around quality, support, and compensation (Ascione, 2017). Yet, these concerns are motivated by over-commitment, mounting pressures and lack of time among the faculty. Faculty support such as help in designing classes, implementation of accessibility standards, and use of formative assessment surveys all help. But, at the core, faculty concerns are beyond merely needing help with the implementation of their online classes. Faculty members are mostly concerned about the time required and the conflict with their other commitments.

The first concern—about time—can best be addressed by providing faculty members what they need, when they need it, and in the most efficient format possible. The second concern—about conflicting priorities—can be addressed by supporting services to faculty members to assist them in meeting their research and service obligations. When seen holistically, these research and service functions are not outside the distance learning strategic plan because if they are not addressed, faculty engagement and support is vulnerable. Going beyond instructional design and learning management

system (LMS) support to provide encouragement and assistance to faculty members in meeting their broad obligations is an effective way to raise the quality of online courses and support for new online initiatives.

Assessment of Faculty Support

To effectively assess the needs associated with the development of faculty support, as a leader in online learning and as part of the strategic planning process, one must engage faculty in honest and transparent discussions around the following questions:

1. Are faculty, overall, satisfied with support received?
2. Is faculty satisfaction apparent through the satisfaction of students enrolled in online classes?
3. Does student retention data recognize a supported faculty contingent involved in distance teaching?
4. Are there sufficient structures in place to allow faculty support units to be successful? If not, what structures are not in place or are deficient?
5. Is data available to benchmark faculty satisfaction across multiple semesters/years?
6. What are the current online degrees available?
7. Are faculty actively engaged with innovation in teaching and learning, knowing they will be supported in these efforts?

Student Support

Students are—or should be—at the very center of all that we do at the university. They are the raison d'etre for the university in the first place. For strategic planning purposes, it is critical to understand who our students are. The demographics and needs of distant learning students differ from those who have been termed "traditional students" over the past century and more. Distant students are, for the most part, older. At UIS, for example, the average age of the distance undergraduate student is more than 32 and of the distance graduate student more than 35. Implicit with the age comes the responsibilities of adulthood, namely family (often including their parents as well as their children), household (including housing expenses), career employment (including positions of extended responsibilities often going beyond the eight-hour day), and more. These factors—added to the reality that the students are, by definition, not located proximate to the administrative and faculty offices of the university—mean that special communication affordances must be made to assure that their needs are met in a timely and effective way.

The most effective distance learning programs connect with their students in a high-touch, personal way. As with any service business, it is the relationship with the consumer that makes all of the difference in retention and satisfaction. A wide array of quality frameworks have emerged, all of which set standards for engaging and supporting the student at a distance (Stewart, Goodson, Miertschin, Norwood, & Ezell, 2013). With the number of colleges and universities offering distance learning programs growing each year, students have an ever-widening array of schools from which to choose. A new school is "just a click away." Those institutions that fail to respond to student support needs are at risk for high dropout and low completion rates.

Among the areas of distance student support are those that fall into at least three areas: technical, academic, and study planning (Morrison, 2014). As the quality of learning management systems, synchronous learning services, and related technologies improve, the need in the area of technical support may diminish. But, it is not going to go away soon. The complexity of student platforms, variety of connectivity options, and the discouraging rise of malware online are certain to keep

information technology staff members busy for decades to come. Every student, on or off campus, needs access to academic advising, the office of the registrar, and the bursar's office for paying tuition and other charges. Students taking courses from 1,000 miles away cannot merely stroll into those offices for personal service as needs arise. Distance learning programs must strive to provide effective and supportive services in these areas that may cause high stress for the student. Further, there are needs to facilitate access university library materials, tutoring, and mentoring, and many universities have found it valuable to provide access to social and psychological counseling services and referrals.

This complex package of student services is intended to meet the needs of the distant student as effectively as possible. It is important that careful planning is conducted to assess student needs and to create an efficient and effective administrative structure through which those services will be delivered in a personal and friendly way. As with all areas of student contact, FERPA rules must be acknowledged and carefully followed.

Assessment of Student Support

To effectively assess the needs associated with supporting students, and as part of the strategic planning process, one must engage faculty in honest and transparent discussions around the following questions:

1. Are students, overall, satisfied with support they have received while studying at a distance?
2. Do both current students and alumni report satisfaction with the services received?
3. Is student retention data triangulated with other data sets to determine student satisfaction?
4. Are there sufficient structures in place to allow student support units to be successful? If not, what structures are not in place or are deficient?
5. Is data available to benchmark student satisfaction across multiple semesters/years?
6. Do students recommend friends to your online degree programs? If not, why not?

Digital Technology

When one thinks of a university, often the campus grounds, the quad, the architecture of the buildings, and the ambiance of the classrooms, student union, and dormitories come to mind. They are the structures that create the unique environment for learning. For the distance learning student, there are the classrooms, the discussion centers, the virtual library, the chat rooms, and the university Web pages, including images that comprise the analogous environment for learning. Just as the physical grounds and buildings must be maintained meticulously, so too must the digital environment be refreshed and renewed to assure that it is up to date and inviting. As much as classroom quality and study space is central to the physical campus strategic plan, the distance education plan must address the digital delivery system, network security, and environment.

Unlike the physical campus that may change little over the years, the digital campus is constantly changing with the advent of new technologies. Virtual reality, augmented and mixed reality, virtual laboratories, adaptive learning programs, and artificial intelligence are fueling advances in the field of distance education. All of these are informed by large-scale data analytics. Computer programs mounted on super computers and endowed with artificial intelligence are now taking the place of online teaching assistants (Maderer, 2017). Such advances are enhancing responsiveness and enhancing both the faculty and student experiences.

It is critical to create an administrative structure that will support the exploration, experimentation, and implementation of advancing technologies. Leadership in this area must be cultivated that

will respond to the needs of the programs. It must also be linked to faculty interests. Funding must be provided to assure that the distance education program does not fall behind the field.

The area of digital technology is a dynamic one. It is the backbone of the delivery of distance learning, but it must be balanced to the needs of the students and interests of the faculty, while at the same time there must be assurances that investments are not made in technologies that are destined to fail or fade rapidly. This area is commonly interconnected with entrepreneurship and both internal and external leadership.

Assessment of Digital Technology

Creating needs assessment in the area of digital technology is quite challenging. The needs assessment may be dominated by a technological focus. To serve the needs of the institution those who oversee Information Technology, as well as the end user of all digital components should have a voice in developing the needs assessment for a strong strategic planning process. The following questions may serve as a springboard for discussions related to digital technologies:

1. Are all stakeholders, overall, satisfied with support of the digital technology provided for the teaching and learning process?
2. Is data available for review from the following areas:
    a. Trouble logs?
    b. System performance?
    c. System utilization?
    d. Web server statistics?
    e. LMS server or cloud-based statistics?
    f. Network bandwidth?
    g. Tools available for teaching and learning?
    h. Authentication systems?
    i. Reporting structures utilized by staff and faculty within distance learning programs?
    j. Faculty training reports?
    k. Social media reports?
    l. Search optimization?
    m. Specialized digital technologies related to your campus?
3. Are there sufficient structures in place to allow units who collaborate on areas of digital technology to be successful? If not, what structures are not in place or are deficient?

External Advocacy

This category is a broad one; for our purposes, it ranges from marketing and promotion to state, national, and international leadership and advocacy of distance education and the institution. The field of distance education has grown enormously over the past 20 years. For the fall term of 2014, a total of 2,910 higher education institutions reported "'exclusively' distance education enrollments." (Poulin & Straut, 2016, p. 28). "Public institutions enrolled 2/3 of all distance education students" (Seaman, Allen, Seaman, 2015 p.13). Competition continues to grow. As a result, successful institutions must find ways to differentiate their distance learning programs to the public. This calls for careful and strategic marketing that reaches the students who are best suited to succeed in the selected distance programs. The wide variety of ways and modes of marketing, from paid leads from

third-party vendors to social media marketing to carefully crafted news releases, must be considered. Without a successful marketing program, there will be no success.

Institutional success in distance education, however, calls for more than marketing—powerful leadership is needed to influence state and federal policies, attract grant support, and enhance the program's reputation among feeder institutions whereby faculty members and advisers can direct students into the program with confidence and enthusiasm. One route to leadership in the field is through innovation, scholarship, publications, and presentations that build a reputation of expertise and competency in the field. Another route is through leadership in state and national associations whereby the expertise of faculty members and administrators from the institution can build awareness and influence.

In this burgeoning field, it is national leadership and wise marketing that will bring recognition and, ultimately, enrollments. And, it is well-informed and efficient marketing that will garner excellent returns on the dollars invested to attract students. A coordinated effort that combines both national recognition and wise marketing has the potential to best serve the institution.

Assessment of External Advocacy

To effectively assess the needs associated with supporting students, and as part of the strategic planning process, one must engage faculty in honest and transparent discussions around the following questions:

1. Is the public generally aware of the university distance learning program?
2. Is the university recognized by its peers?
3. Are distance learning graduates sought after by employers and recruited prior to graduation?
4. Are there sufficient structures in place to allow distance learning units seek and proceed with national grant programs? If not, what structures are not in place or are deficient?
5. Is the university a recognized member in professional associations and organizations?
6. Is the university in compliance with state and federal regulations related to distance education?
7. Are stakeholders engaged in conversations external to the university regarding opportunities and challenges related to online learning?
8. Are distance learning strategic partnerships being initiated or led by the university?

Professionalism

Cultivating and maintaining a high level of professionalism is an important aspect of the successful distance education program. The distance learning field grew out of correspondence learning and electronic communication such as the bulletin board systems of the 1980s and early email programs. In the early years, online distance learning was not considered by many as good as campus-based learning. Over time, the research has shown that online learning is as good as—and, in many cases, better than—campus-based learning (Means, Toyama, Murphy, Bakia, & Jones, 2010)

Yet, distance education remains a relative "newcomer" to higher education. As such, it is especially important that those associated with the field exhibit professionalism in all they do. Professionalism may not be easy to define in this context, but it certainly includes identifiable qualities such as putting the student first, cultivating deep understanding and expertise, doing more than expected, communicating effectively, following high-level principles, and sharing knowledge freely (Norton, 2010).

To be taken seriously in academe, those in distance learning must achieve a higher standard than many in the mainstream. By association, their high standards will be seen as reflective of the high

standards maintained in the distance learning program. To achieve this end, professional development for the community of practice in distance education and strong modeling of professionalism by the leaders of the program should be done.

Assessment of Professionalism

To effectively assess the needs associated with professional approaches for distance learning leaders and units, one must engage internal and external stakeholders in honest and transparent discussions around the following questions:

1. Is the distance learning program experiencing growth?
2. Has a system of shared values and trust been identified and communicated internally and externally?
3. Is distance learning trusted within the university by faculty, students, and staff?
4. Are distance learning graduates sought after by employers and recruited prior to graduation?
5. Are internal conflicts resolved appropriately? Are external conflicts resolved appropriately?
6. Does the distance education unit succeed with low turnover rates?
7. Is the image of the distance learning unit consistent with the branding perceptions of the university?
8. Is a professional approach present every day in every action by the distance education leaders, staff, and faculty?

Conclusion

Berge and Schrum (1998) posited that succeeding at distance learning includes creating and defining the teaching and learning environment in which faculty and students will move toward degree/goal completion. Strategic planning for distance learning is even more critical under the pressures higher education faces today. To build a strong strategic plan, it is necessary to first assess where an institution is and understand how it arrived at its current place within the institution in order to chart the course to achieve what is needed to move it to the next level of performance. Aligning the necessary components, a strong assessment and evaluation of current practices and budget are necessary for a strategic plan to be useable and for an institution to succeed. We have outlined a format for understanding and assessing the primary functions in the field of distance learning based on the Hallmarks of Excellence in Online Leadership (Halfond et al., 2015). This aspirational framework will guide those planning the strategic future of the institution to envision the future and pathways to accomplish that vision.

Sample Distance Education Strategic Plans

This section includes an alphabetized list of links to a number of well-developed strategic plans that might assist with understanding the components and priorities of institutions that have developed their own processes of strategy and sustainability.

Florida State ODL Strategic Plan: https://distance.fsu.edu/docs/admin_docs/ODLStrategicPlan.pdf

Indiana University Strategic Plan for Online Education: https://uaa.iu.edu/docs/StrategicPlanOnlineEd.pdf

Ohio State Distance Education and e-learning Strategic Plan: https://odee.osu.edu/sites/default/files/odee-strategicplan.pdf

Truman State Strategic Plan for Online Learning: http://online.truman.edu/files/2014/12/Online-Strategic-Planning-Document-final.pdf

UMUC Strategic Plan: www.umuc.edu/documents/upload/umuc-strategic-plan.pdf

Virginia Tech Distance Learning Strategic Plan: https://vtnews.vt.edu/articles/2012/10/101612-dlss-dlsp.html

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U.S. FEDERAL POLICY IN DISTANCE EDUCATION

Van L. Davis

In 1916, John Dewey published his seminal work, *Democracy and Education*. In this treatise on the role of education in furthering democracy, he reflected on the impact of pedagogy on education when he wrote, "A society which is mobile, which is full of channels for the distribution of a change occuring anywhere, must see to it that its members are educated to personal initiative and adaptability. Otherwise, they will be overwhelmed by the changes in which they are caught." (Dewey, 1916/2008, Chapter 7, para.9). Nothing could be more true as we reflect on the role and impact of technology in education in the 21st century. Not only has technology transformed education in profound ways, but the evolution of distance education into online education has expanded educational opportunities for countless students. This expansion, however, has not been without controversy. As a larger number of students enroll in distance education courses, federal investments in distance education, especially financial aid, have skyrocketed. As a result, federal policy in shaping and regulating distance education has increased. Despite this increasing regulatory environment, scant scholarship exists examining the role of federal policy in shaping higher education distance education.

To better understand the role of federal policy in higher education distance education, it's helpful to borrow the framework that Roumell and Salajan (2016) developed to examine the National Education Technology Plans. Its facets are:

- Policy provisions for requisite infrastructure.
- Policy provisions for software, materials, and product development.
- Policy provisions for transforming teach and learning.
- Policy provisions for multiple funding streams and sustainability.
- Policy provisions for multiple stakeholders, public and private interest group, entities, institutions, etc.
- Policy provisions for development of consortia and institutional/regional agreements, collaboration, and cooperation.
- Policy provisions for increasing and/or diversifying research, evaluation, and assessment.
- Policy provisions for the promotion of wider education reform processes.
- Policy provisions for social issues, all-inclusive society, societal benefits, social model, social progress, individual needs, etc. (Roumell & Salajan, 2016, p. 370).

Although the National Education Technology Plans are primarily K-12 documents, several of these nine facets can be applied to an examination of the role of federal policy in higher education distance education. Specifically, this chapter will explore:

- Policy provisions for multiple funding streams and sustainability.
- Policy provisions for multiple stakeholders, public and private interest group entities, institutions, etc.
- Policy provisions for transforming teaching and learning.
- Policy provisions for social issues, all-inclusive society, societal benefits, social model, social progress, individual needs, etc.

Contextualizing Federal Distance Education Policy

In order to understand the development of federal distance education policy, it's useful to examine the growth of distance education. Distance education is not a new development in the United States. The earliest example of distance education dates back to the development of correspondence education in the 18th century. In 1728, an advertisement for a correspondence shorthand course ran in the *Boston Globe* (Fishman, 2013, p. 1). As a national postal system developed, correspondence education flourished. In 1874, Illinois Wesleyan University became the first college to sponsor correspondence courses (Fishman, 2013, p. 2). This surge in correspondence education was tied to both the rise of the Chautauqua movement (Kentnor, 2015, p. 23) as well as the 1862 Morrill Land Grant Act which provided money for the development of state colleges that began to run extension programs that offered non-credit coursework, often tied to agriculture and other local needs, to the public (Fishman, 2013, p. 2). As new technologies such as radio developed, colleges began experimenting with ways to leverage those technologies for educational purposes. In the fall of 1928, Ohio State University's education department launched the Ohio School of Air (Kentnor, 2015, p. 24), and four years later the University of Iowa began experimenting with using television for educational purposes (Saba, 2011, p. 12). As television sets became more common in the 1950s and with the Federal Communication Commission's decision to set aside frequencies for educational purposes, distance education surged.

This surge, however, was nothing compared to what would come with the development of the Internet and the 1991 introduction of the World Wide Web. In 2002, 1.6 million college students—11% of all college students—were taking at least one online course, and 578,000 of those students were taking all of their courses online (Allen & Seaman, 2003, p. 1). Five years later, the online student population had grown by 118% to almost 3.5 million students—almost 20% of the college student population (Allen & Seaman, 2007, p. 1). By 2014, the online student population had grown to 5.8 million students—over 28% of the entire student population—taking at least one online course, a 263% increase since 2002. Over 3 million of these students were in fully online programs (Allen & Seaman, 2016, p. 4).

Policy Provisions for Multiple Funding Streams

The rapid development of online education and its popularity led to a surge in the development of federal education policy and regulation. In response to a wave of correspondence fraud cases in the 1980s, online education courses were classified as correspondence courses and, therefore, ineligible for student financial aid. In fact, 1992 amendments to the Higher Education Act proved especially difficult for online education. To protect federal dollars from being fraudulently used for student financial aid, the amendments created the 50% rule—a regulation that disallowed students from receiving Title IV of the 1965 Higher Education Act financial aid if more than half of their

institution's students were enrolled in correspondence and online courses. Additional amendments to the Act also defined an academic year as 30 weeks of instruction, defined a full-time student as one who completed at least 24 semester credit hours during the year, and required 12 hours of instruction per week (20 U.S.C. §481[a][2]).

After extensive lobbying and discussion, the 1998 amendments to the Higher Education Act lifted restrictions on the emerging field of online education. In recognition of the growing online education field, the amendments authorized the creation of the Distance Education Demonstration Projects. Schools participating in this program would become eligible for their students to receive Title IV student financial aid, even if they were subject to the 50% rule. The 1998 Higher Education Act also authorized funding for the Learning Anytime Anywhere Partnerships program which ran from 1999 to 2001 and funded "asynchronous, innovative, scalable, and nationally significant distance education projects" (Learning Anytime Anywhere Partnerships [LAAP] 2006).

Continued lobbying efforts and the success of the demonstration project schools led to the elimination of the 12-hour rule in 2002. Instead of requiring 12 hours of instruction per week, the rule was amended to require one day of instruction. This rule change allowed for the possibility that online students might not be engaging with faculty and material several days a week but might be participating in their education for large chunks of time one or two days a week. In 2005, the Higher Education Reconciliation Act rescinded the 50% rule and effectively reclassified online courses as telecommunication courses and not correspondence. Fearful of financial aid fraud and concerned about the quality of education, the new definition of distance education found in 34 C.F.R. §600.2(a) included the following:

> A course offered principally through the use of one or a combination of technologies . . . to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between these students and instructor, either synchronously or asynchronously. . . . If the course does not qualify as a telecommunications course, it is considered to be a correspondence course.

As online education grows and becomes more innovative with the development of competency-based education, adaptive learning, and other pedagogical innovations, the 2006 inclusion of the phrase "regular and substantive interaction" becomes increasingly important.

Policy Provisions for Multiple Stakeholders, Public and Private Interest Groups, Entities, Institutions, Etc.

Consumer Protection

Just as federal policy became important in creating multiple funding streams for distance education, it also had to find a balance among multiple stakeholders. One of the largest challenges in this arena was around the issues of consumer protection and quality assurance with distance education advocates on one side and a combination of consumer protection and advocates for traditional forms of education on the other. This tension often played out in a public way as multiple stakeholders—students, non-profits interested in education reform, distance educators at both non-profit and for-profit institutions, accreditors, and taxpayers—vied to have their voices heard and to influence federal policy. As an increasing number of students eligible for Title IV financial aid enrolled in online education courses, the voices of those stakeholders concerned about quality and consumer protection grew louder.

In 2004, the General Accounting Office issued a report to Congress on distance education that examined data collection, program cost, and quality assessments. The report concluded that "The

federal government has a substantial interest in the quality of postsecondary education, including distance education programs. . . . At the same time, some form of control is needed to prevent the potential for fraud and abuse" (Ashby, 2004, p. 3). Echoing those concerns, the Department of Education's Office of Inspector General (OIG) issued a September 2011 report on distance education fraud rings that found, "Education programs that are delivered solely through the Internet present unique opportunities for fraud and challenges for oversight, because Title IV programs were designed primarily to deliver aid to students who are physically present in traditional classrooms, rather than alternative on-line environments" (OIG, 2011, p. 3).

Between 2005 and 2011, the Inspector General reported that his office had opened 100 investigations into financial aid fraud in distance education programs. Of particular concern in the 2011 report was the increase in fraud rings that used "straw students" who provided personal identification information to the ringleader for the purpose of fraudulently enrolling those students in online programs. Straw students either never attended class or often dropped out after their Title IV funds were received after the 30th day of class. Once the institution deducted the cost of tuition, the balance would be sent to the straw student, who would share a portion with the ringleader. Often these students would be enrolled in multiple institutions at the same time. The problem became so pervasive that the Inspector General reported that between 2005 and 2011, 215 fraud ring participants from 42 fraud rings were convicted and fined over $7 million. The Inspector General went on to note, however, that this was a small percentage of the actual fraud in online education being committed. The Inspector General ended his report by recommending that the Department of Education create regulations that would require institutions to: (a) verify a student's identification; (b) reduce the cost of attendance for online programs so students would be eligible for less financial aid; and (c) verify that all students are eligible for enrollment (OIG, 2011, p. 14).

The Department of Education responded by issuing an "urgent call to action" to all institutions on October 20, 2011, and reminded institutions that they were statutorily required to verify student identifications and "take steps necessary to ensure that students are academically engaged prior to disbursing Title IV funds" (Department of Education, 2011, p. 1). Institutions were also advised to implement automated protocols that could monitor student information systems and detect potential straw students as well as modifying financial aid disbursement rules for online education students so as to minimize fraud.

Since 2011, the focus on students committing fraud against the government has lessened and been replaced with consumer protection concerns that institutions are taking advantage of students. In part, this shift can be attributed to improved technologies such as the development of biometrics for student identification purposes, as well as improved student information systems. These technologies have allowed institutions to better verify a student's identity as well as improve financial aid disbursement. As a result, less attention has been focused on fraud and more attention has been focused on consumer protection and the assurance that online education is of the same quality as face-to-face education.

State Reciprocity and Consortia Development

One of the several results over the shift from focusing on fraud to consumer protection is the development of regulations regarding out-of-state distance education. As a part of the 2010 revisions regarding program integrity found in 34 C.F.R. §600.9(c), institutions must be authorized in each state in which a student resides. The statute reads:

> If an institution is offering postsecondary education through distance or correspondence education to students in a State in which it is not physically located or which it is otherwise subject to State jurisdiction as determined by the State, the institution must meet any

> State requirements for it to be legally offering postsecondary distance or correspondence education in that State. An institution must be able to document to the Secretary the State's approval upon request.

The practical ramifications of this change in statute were both immediate and massive. As institutions scrambled to determine how they should comply with the myriad state higher education authorization laws, consumer protection activists seized upon the regulations as an opportunity to exert more control over online education, a practice that many erroneously conflated with for-profit education providers and suspected to be of lower quality than face-to-face education. As Christopher Haynes wrote in an opinion piece for *Inside Higher Ed*, "Stigma and perception drive resistance to online education more than data analysis and direct experience" (Haynes, 2017).

In 2012, the initial regulations were vacated by the United States Court of Appeals for the District of Columbia Circuit on procedural grounds. As a result, the Department of Education engaged in the negotiated rulemaking process in an effort to create a second set of regulations. Despite four two-day long meetings, the 18-member negotiated rulemaking committee could not agree on an alternative set of regulations. The Department of Education then released new 34 C.F.R §600.9(c) regulations in 2016 that were slated to go into effect on July 1, 2018. After another flurry of public comments and concerns, most of which focused on ambiguity in the regulatory language, the department delayed enforcement of those regulations for another two years. Although there were several issues that the department was asked to clarify in the regulations, most comments have revolved around the idea of consortia arrangements for out-of-state distance education reciprocity.

As many institutions struggled to determine how they could track and meet the demand of the different and diverse regulatory requirements found across the 50 states, discussion of the creation of some sort of state-level reciprocity arrangement grew stronger. In 2012, American Public and Land-Grant Universities (APLU) and the State Higher Education Executive Officers (SHEEO) convened a 22-person committee to examine the feasibility of a national reciprocity agreement for distance education providers. The resulting 2013 report by the Commission on the Regulation of Postsecondary Distance Education and its corresponding meeting of 47 teams of state higher education regulators recommended the development of a national reciprocity agreement. As the Commission's final report, "Advancing Access through Regulatory Reform: Findings, Principles, and Recommendations for the State Authorization Reciprocity," put it:

> The advent of large scale distance education programs has led to the unprecedented availability of educational opportunities to students across the United States. The regulation of distance education is of growing significance as distance education providers work in more than one state—and often in many states. . . . State and federal oversight of distance education is important but such oversight cannot overly burden multistate distance education providers. Unless alternatives are developed to the current 50+ state compliance system, many providers may choose to limit the states where distance education is offered, thereby denying access to students who otherwise would not have those educational opportunities.
>
> *(Commission on the Regulation of Postsecondary Education, 2013, p. 6)*

The Commission was well aware of the difficulties of creating such a reciprocal arrangement with so many diverse stakeholders, state governments, and varied regulatory requirements. For example, the Commission's report noted that whereas some states required only education providers with a "physical presence" in the state to receive authorization, other states required all education providers be authorized, and yet other states required nothing in the way of state authorization for out-of-state providers. Even the definition of "physical presence" could vary drastically from state to state and

might encompass anything from advertising in the state to engaging in recruiting activities to physically teaching students in the state (Commission on the Regulation of Postsecondary Education, 2013, p. 6). Additionally, even if institutions were able to navigate the varied and complex regulations, they faced possibly tens of thousands of dollars in fees to come into compliance in all of the states where their online students resided. The Commission's recommended solution was to leverage the four existing regional education compacts (the Midwestern Higher Education Compact, the New England Board of Higher Education, the Southern Regional Education Board, and the Western Interstate Commission on Higher Education). These compacts would use their existing memberships to reach an agreement on out-of-state distance education reciprocity among members, while the four regional compacts would then reach a reciprocity agreement and form NC-SARA, the National Council for State Authorization Reciprocity Agreements (Commission on the Regulation of Postsecondary Education, 2013, p. 20).[1]

In a nod toward acknowledging the development of such a unique regulatory compact, the Department of Education's proposed regulations acknowledged the role of regional compacts and the development of out-of-state distance education reciprocity agreements. In its July 2016 notification of proposed regulations, the department indicated that the proposal of 34 C.F.R §600.9(c)(2)(ii) would allow an institution to document that it was covered under a state authorization reciprocity agreement as a means of fulfilling federal requirements to show authorization to enroll online students in another state (Department of Education, 2016, pp. 26–27). But the idea of NC-SARA and the role that it would play in authorizing out-of-state distance education has not been without its detractors. That same year, more than 30 consumer protection and legal organizations signed a letter lobbying New York State Education Commissioner MaryEllen Elia to not join NC-SARA. According to these organizations:

> Online education is in need of oversight, but SARA goes too far in protecting colleges while failing to adequately protect consumers. . . . If the state signs the SARA agreement, however, New York would formally agree to the weaker oversight of out-of-state online schools, effectively ceding the ability to guard its citizens against abusive practices. . . . Creating some type of interstate approach to the oversight of online schools could be a useful step. However, SARA is drafted in a way that makes serious problems inevitable. . . . [T]he SARA agreement induces every college to become an advocate for the worst, most predatory company.
>
> *(Open letter to New York State Education Commissioner MaryEllen Elia, March 16, 2016)*

As the discussions over online education and consumer protection, state authorization, and reciprocal agreements continues, the role of the federal government in developing policy provisions that balance the diverse needs and concerns of multiple stakeholders continues to escalate. Additionally, these conversations lead directly into the next set of policy considerations: provisions for teaching and learning.

Policy Provisions for Teaching and Learning

Although the federal government has largely ignored pedagogical issues in its higher education policy, there is one pedagogical area in which the Department of Education's regulations have created much discussion and controversy: regular and substantive interaction.

The requirement for regular and substantive interaction in distance education courses can be traced to the 2005 definition of a telecommunications course in 34 C.F.R §600.2, which included the requirement that all telecommunications courses must include "regular and substantive interaction

between the student and the instructor." When telecommunications course was replaced with distance education course in 2010, the statute was changed to read:

> *Distance education* means education that uses one or more of the technologies listed in paragraphs (1) through (4) of this definition to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between the students and the instructor, either synchronously or asynchronously. The technologies may include-
>
> (1) The internet;
> (2) One-way and two-way transmissions through open broadcast, closed circuit, cable, microwave, broadband lines, fiber optics, satellite, or wireless communications devices;
> (3) Audio conferencing; or
> (4) Video cassettes, DVDs, and CD-ROMs, if the cassettes, DVDs, or CD-ROMs are used in a course in conjunction with any of the technologies listed in paragraphs (1) through (3) of this definition.

Unfortunately, this key phrase, "regular and substantive interaction," was never defined in either regulation, thus creating numerous conversations and arguments about the role of and types of interaction pedagogically appropriate in online education.

These arguments began in earnest after the Department of Education's Office of Inspector General released its 2012 audit of Saint Mary-of-the-Woods College, a small, non-profit Catholic liberal arts college in Illinois. After an audit of four years of the institution's courses and financial aid awards, the Inspector General found that Saint Mary-of-the-Woods had not been eligible to participate in any Title IV student financial aid programs because the coursework in its Woods External Degree (WED) program did not meet the definition of a telecommunications course and was, instead, correspondence. This meant that by the Inspector General's interpretation of 34 C.F.R. §600.2, over 50% of the college's students were enrolled in correspondence education, thus making the institution subject to the 50% rule and ineligible for any of its students to receive federal financial aid (OIG, 2012, p. 1).

Of particular concern to the Inspector General was both the ways in which instructors used technology and whether or not instructors initiated interactions with their students. Although the college used a learning management system for the WED program as well as its Woods Online program, the Inspector General found that courses in the WED program were not "principally offered through a technological medium" because students had the option of sending assignments via postal mail, email, or the institution's learning management system (OIG, 2012, p. 5). In its response to the college, the Inspector General noted, "The use of telecommunications and other technology in the delivery of distance learning does not, in and of itself, qualify a course as a telecommunications course" (OIG, 2012, pp. 13–14). To support its argument that a course using technology might not be a telecommunications course, the Inspector General referred to the preamble of the revised 2006 regulations defining telecommunication courses.

> A definition of telecommunications course that focused exclusively on technologies could be erroneously interpreted to allow an institution to qualify for full participation in Title IV, HEA programs upon introduction of minor e-mail contact between students and a grader or instructional assistant (who may or may not have subject matter expertise) into what is essentially a correspondence course.
>
> *(OIG, 2012, p. 14)*

Lacking evidence of substantive interaction between students and instructors via technology, the Saint Mary-of-the-Woods College courses could not be telecommunication courses, according to the Inspector General.

In addition to the argument that technologies were not substantially used for instructional purposes in WED coursework, the Inspector General also questioned whether or not **regular** interactions were taking place. After interviewing staff, instructors, and students involved in the WED program, the Inspector General concluded:

> [I]nstructors did not deliver lectures or initiate discussions with students. Tutoring and other instructional resources were provided at the student's discretion. Eighty percent of assignments were due 2 weeks before the term ended, and the remaining 20 percent of assignments were due at the end of the term.
>
> *(OIG, 2012, p. 8)*

Thus, the Inspector General concluded that Saint Mary-of-the-Woods was not offering regular or substantive interaction in its Woods External Degree program making that coursework correspondence coursework rather than telecommunications coursework. As a result, the Inspector General determined that Saint-Mary-of-the-Woods was in violation of the 50% rule, and Saint Mary-of-the-Woods should return to the federal government over $42 million in misawarded student financial aid (OIG, 2012, p. 2).

Needless to say, the Inspector General's report garnered much attention among institutions offering online education. By December 2014, there was enough confusion about the interpretation of regular and substantive interaction that Acting Assistant Secretary for Postsecondary Education Lynn Mahaffie issued a letter meant to, among other things, clarify regular and substantive interaction. Although that letter was focused on competency-based education (CBE), the section on regular and substantive interaction was also applicable to the larger field of distance education. In response to the question, "What are the required conditions for regular and substantive interaction between students and instructors for CBE programs, including direct assessment?" the Department responded with what regular and substantive interaction was **not**.

> We do not consider interaction that is wholly optional or initiated primarily by the student to be regular and substantive interaction between students and instructors. Interaction that occurs only upon the request of the student (either electronically or otherwise) would not be considered regular and substantive interaction.
>
> *(Department of Education, 2014)*

However, that still begs the question—what constitutes regular and substantive interaction? The same "Dear Colleague" letter went on to list several different types of educational activities, that at least within the context of competency-based education *might* constitute "engagement" including:

- Participating in regularly scheduled learning sessions (where there is an opportunity for direct interaction between the student and the faculty member).
- Submitting an academic assignment.
- Taking an exam, an interactive tutorial, or computer-assisted instruction.
- Attending a study group that is assigned by the institution.
- Participating in an online discussion about academic matters.
- Consultation with a faculty mentor to discuss academic course content.
- Participation in faculty-guided independent study (Department of Education, 2014).

Sadly, though, the letter quickly goes on to state, "Note that not all of the educational activities described above fulfill the requirements for regular and substantive interaction between students and instructors." Nowhere does the letter go on to elaborate or clarify this last statement.

Two subsequent audits by the Department's Office of Inspector General, one in 2015 and another in 2016, also raised the issue of regular and substantive interaction without much explanation of the term's meaning. On September 30, 2015, the Office of Inspector General issued an audit of the Higher Learning Commission (HLC), one of the six regional accreditors, and its evaluation of competency-based education courses. Among the audit's findings, HLC was accused of not consistently applying its accreditation standards when reviewing CBE programs. As a result, the Inspector General charged HLC with approving the substantive change applications of six institutions

> even though the applications described the proposed programs as self-paced programs and did not clearly indicate that the programs would include *regular and substantive interaction between students and school employees* who met the Higher Learning Commission's definition of faculty members.
>
> *(OIG, 2015, p. 9)*

Similar findings can be found in the Office of Inspector General's August 2, 2016, audit of the Western Association of Schools and Colleges (WASC), another one of the six regional accreditors. In this case, the Inspector General specifically called out WASC's handling of regular and substantive interaction in accreditation reviews, finding that "the commission did not sufficiently evaluate whether proposed competency-based education programs included faculty-initiated, regular and substantive interaction" (OIG, 2016, p. 7). It is of note that although both of these audits fault the accreditors for not uniformly correctly evaluating the presence of regular and substantive faculty-initiated interaction, neither audit attempts to define regular and substantive interaction beyond the non-definition found in the December 2014 "Dear Colleague" letter.

The most recent discussion of what constitutes regular and substantive interaction can be found in the Office of Inspector General's September 2017 audit of Western Governors University (WGU), the largest competency-based education provider in the country and one of its largest providers of online education. After admitting that there is not a statutory definition of regular and substantive interaction, the OIG lays out what it believes to be the "ordinary meaning" of "regular and substantive" interaction between students and instructors. Instructors are, according to the OIG, "someone who instructs or provides knowledge about the subject matter of the course," and that includes only course mentors and evaluators. Substantive interaction is defined as "relevant to the subject matter" and involves a "student interaction with a course mentor or required an individual submission of a performance task for which an evaluator provided the student feedback" (OIG, 2017, pp. 14–16).

Most importantly, the OIG goes on to define what is NOT substantive interaction. Substantive interaction does NOT include:

- Computer-generated feedback on objective assessments.
- Recorded webinars, videos, and reading materials if the course design materials did not require the students to watch the webinars and then interact with an instructor.
- Contact with mentoring staff who are not directly providing instruction on the course's subject matter (OIG, 2017, p. 16).

Finally, the OIG tackles regular interaction, defining it as "occurring with some reasonable frequency considering the school-suggested length of the course" (OIG, 2017, p. 15).

What does this look like on a practical basis? We can find a hint earlier in the report where the OIG recommends that WGU should (emphasis added): "Ensure that the school-defined academic year will include at least 30 weeks of instructional time and *each of the weeks will include at least 1 day of regularly scheduled instruction or an examination*" (OIG, 2017, p. 5). This definition of regular interaction

can be traced back to a March 2011 "Dear Colleague" letter on program integrity and the rescinding of the 12-hour rule.

In March 2011, the Department of Education issued a "Dear Colleague" letter on program integrity. Although that document did not directly address "regular and substantive interaction," it did delve into the statutory definition of credit hour and week of instructional time. Explaining that 34 C.F.R §600.2 defined "week of instructional time" as:

> any seven-day period in which at least one day of regularly scheduled instruction or examination occurs. . . . Thus, in any seven-day period, a student is expected to be academically engaged through, for example, classroom attendance, examinations, practica, laboratory work, internships, and supervised studio work. In the case of distance education and correspondence education, academic engagement would include, but not be limited to, submitting an academic assignment; taking an exam, an interactive tutorial, or computer-assisted instruction; attending a study group that was assigned by the institution; contributing to an academic online discussion; and initiating contact with a faculty member to ask a question about the academic subject studied in the course
>
> *(Ochoa, 2011, p. 5)*

Given the application of these definitions of regular and substantive interaction, the Inspector General ruled that Western Governors University's online competency-based education coursework did not fulfill the statutory definition of distance education and should be classified as correspondence education. As a result, the Inspector General argued, WGU was in violation of the 50% rule and, therefore, ineligible for any of its students to receive financial aid. Therefore, the Inspector General argued, the institution should return over $712.6 million in Title IV funds to the Department of Education. It is important to note that the Inspector General's recommendations are only that: recommendations. Final authority regarding the recommended actions lays with the Secretary of Education. As of June 2018, the Secretary of Education had not issued a final ruling regarding the return of Title IV funds in either the Saint Mary-of-the-Woods College case or the Western Governors University case.

Although this regulatory discussion of regular and substantive instruction may appear to be legalistic and primarily focused on establishing eligibility for Title IV student financial aid, the definitions touch on some fundamental pedagogical issues—who is responsible for instruction and how that instruction should be delivered. By focusing on defining instruction as needing to be both regular and substantive in nature in order to be eligible for Title IV student financial aid, the Department of Education is, in effect, making a value judgment on what constitutes a quality education. This is abundantly clear in the Inspector General's audit of Western Governors University when the audit finding is challenged by WGU. In response to WGU's claim that "its model fulfilled the overarching purpose of the HEA in improving quality and expanding access to higher education," the OIG auditors responded, "we did not assess whether the school's model was improving educational quality or expanding access to higher education" (OIG, 2017, p. 6). Despite the claim that the quality of the educational experience at WGU was not evaluated, the Inspector General's office and the Department of Education are, in fact, endorsing a specific set of pedagogical practices that concentrate on "seat" time over evidence of learning—and that concentration on seat time and its corresponding regulations defining a "week of instructional time," are specifically designed in such a way as to prioritize practices that are more common in face-to-face courses than in online courses. The result is a double standard that prioritizes evidence of attendance over learning, and subjects online courses to a level of scrutiny not levied against face-to-face courses. Whether the Department of Education meant for the regulations found in 34 C.F.R §600.2 to become a commentary on pedagogical practices and the quality of online instruction, that has been the result.

Policy Provisions for Social Issues, All-Inclusive Society, Societal Benefits, Social Model, Social Progress, Individual Needs, Etc.

Historically, much of the conversation surrounding distance education and the creation of a more inclusive society has focused around the use of technology to expand educational access to a greater number of students. These conversations, however, have seldom impacted federal distance education policy and regulations. However, there is another aspect of distance education access and accessibility that has prompted considerable federal regulation: the accessibility of distance and online education to students with disabilities. As U.S. Attorney Carmen Ortiz stated in relation to an accessibility lawsuit against Harvard and MIT MOOC provider edX,

> Critical portions of education are moving online, in tandem with the rest of our social experience. This new, educational online world readily can, and should be, built from the outset in a way that does not discriminate against those with disabilities. Access to high quality education is one of the essential pillars of our democracy and to the well-being of our communities.
>
> *(Department of Justice, 2015)*

In the 2014 resolution agreement between the Department of Education's Office of Civil Rights and the University of Cincinnati, the Department of Education defined accessible as follows:

> "Accessible" means a person with a disability is afforded the opportunity to acquire the same information, engage in the same interactions, and enjoy the same services as a person without a disability in an equally effective and equally integrated manner, with substantially equivalent ease of use. The person with a disability must be able to obtain the information as fully, equally, and independently as a person without a disability. Although this might not result in identical ease of use compared to that of persons without disabilities, it still must ensure equal opportunity to the educational benefits and opportunities afforded by the technology and equal treatment in the use of such technology.
>
> *(OCR, 2013 p. 1)*

This definition of accessible and the corresponding evolution of accessibility law reflect a transition from focusing primarily upon physical accommodations in higher education to a greater emphasis upon providing accessible technological educational resources.

The first piece of federal legislation to focus on accessibility was the Rehabilitation Act of 1973. At the time, much of the legislation focused on the development of vocational rehabilitation services for Americans with disabilities, but Section 504 focused on the creation and extension of civil rights to individuals with disabilities. It is this section that has served as the foundation for much of the educational accessibility regulations and statutes that followed.

Section 504 has since been amended several times and currently states:

> No otherwise qualified individual with a disability in the United States, as defined in section 705(20), shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance or under any program or activity conducted by any Executive agency or by the United States Postal Service. The head of each such agency shall promulgate such regulations as may be necessary to carry out the amendments

> to this section made by the Rehabilitation, Comprehensive Services, and Developmental Disabilities Act of 1978.
>
> *(329 U.S.C. §794[a])*

This prohibition against discrimination on the basis of disability by any program receiving federal funds was expanded in Titles II and III of the 1990 Americans with Disabilities Act (ADA). Title II prohibited discrimination in services, programs, and activities by state and local governments, including public higher education institutions, while Title III prohibited discrimination "in the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of any place of public accommodation" (42 U.S.C. §12182(a)) at private facilities, including private higher education institutions.

Three later legislative actions impacted the development of accessibility regulations impacting higher education—the 1998 amendments to the 1973 Rehabilitation Act and the creation of Section 508, passage of the 21st Century Communications and Video Accessibility Act, and the 2016 Section 508 refresh that adopted Web Content Accessibility Guidelines 2.0. In 1998, the 1973 Rehabilitation Act was amended to include Section 508 which focused on ensuring that the electronic and information technology of all federal agencies were accessible for all Americans (29 U.S.C. §794[d]); it has generally been held that Section 508 extends to all organizations receiving federal funds, including public, private, and for-profit educational institutions. Additionally, in 2010, the 21st Century Communication and Video Accessibility Act passed, requiring that all videos and other technologies be made accessible for individuals with disabilities (21st Century Communications and Video Accessibility Act, 2010). For institutions of higher education, this potentially impacts requirements for video captioning all instructional materials—a challenge for institutions with limited fiscal resources. Finally, in 2016, the Section 508 guidelines were refreshed by the United States Access Board to incorporate the latest version of the Web Content Accessibility Guidelines which outlines the latest accessibility standards for online materials, including educational courses and materials (29 U.S.C. §794[d]).

Despite this regulatory environment, higher education's response to accessibility has tended toward the reactive rather than the proactive (Hollins & Foley, 2013, p. 608). This is particularly troublesome when one considers the increasingly large number of postsecondary students requiring some form of accommodations. The National Center for Education Statistics reports that in 2011–2012, 11% of all college students, approximately two million students, requested some form of accommodation (NCES, 2016). Additionally, the completion rates for students with disabilities are much lower than for those students without disabilities—approximately only a third of students with disabilities graduate from a four-year institution within eight years (Mader & Butrymowicz, 2017). No wonder one student opined, "The problem is not the fact that I'm blind. The problem is the fact that inaccessible technology is woven into the fabric of the collegiate academic experience at many institutions" (National Federation of the Blind, 2017).

Evidence of that reactive nature of higher education are the legal actions taken by students with disabilities, the Department of Justice, and the Department of Education against almost three dozen colleges and universities. Although not all of these cases have been directed against institutions for having inaccessible online learning and electronic learning materials, several of the most prominent cases have focused on distance education. The first major case to target distance education and online learning materials was the 2011–2012 case against Florida State University in which two students accused the institution of inaccessible mathematics coursework (Zhou, 2011). A similar case at the University of Montana was filed in 2012, in which students claimed that the institution's library databases, learning management system, videos, live chat, and course registration system, among other things, were inaccessible to visually impaired students (Department of Education, 2014). In 2015, both Harvard University and the Massachusetts Institute for Technology were sued over allegations

that their jointly developed massive open online course (MOOC) platform and provider, edX, were not accessible. Explaining that "MOOCs have the potential to increase access to high-quality education for people facing income, distance, and other barriers, but only if they are truly open to everyone," then-Acting Assistant Attorney General Vanita Gupta went on to explain how the agreement would have a far-reaching impact on "ensuring that individuals with disabilities will have an equal opportunity to independently and conveniently access quality higher education online" (Department of Justice, 2015).

Perhaps most controversial among these higher education accessibility cases was the 2016 University of California–Berkeley ruling. At that time, UC–Berkeley was informed by the U.S. Department of Justice that it was in:

> violation of Title II because significant portions of its online content [were] not provided in an accessible manner when necessary to ensure effective communication with individuals with hearing, vision or manual disabilities. In addition, UC Berkeley's administrative methods have not ensured that individuals with disabilities have an equal opportunity to use UC Berkeley's online content.
>
> *(Department of Justice, 2016, p. 8)*

Unlike Harvard and MIT, however, Berkeley elected to remove the material and place it behind a firewall rather than make the materials freely available and accessible (Larimer, 2017). Unsurprisingly, this decision raised a great deal of outcry among both scholars and accessibility activists.

The Berkeley decision is emblematic of the tensions that many institutions feel between leveraging innovation and technology to improve student learning and making sure that those technologies are accessible to all potential students. Urging schools to "employ innovative learning tools . . . [b]ecause technology is evolving [and] has the capability to enhance the academic experience for everyone, especially students with disabilities," the Department of Education reflected in a 2011 Frequently Asked Question document that "Innovation and equal access can go hand in hand" (Department of Education, 2011, p. 3). In fact, as early as 1996, colleges and universities were proactively looking at ways to redesign distance education with universal access in mind. That year the California community college system became the first higher education system to adopt principles for the equitable design and implementation of distance education (Distance Education Accessibility Guidelines Taskforce, 2011, p. 3). Unfortunately, compliance remains challenging. A 2017 Instructional Technology Council survey of community college academic and technology leaders found only 33% of those leaders ranked their institutions as either mostly or fully compliant with accessibility standards in their online education courses—a record low in the 14 years of the survey (Lokken, 2017, p. 14)—thus making it clear that despite the recent focus on digital accessibility, accessibility has in no way been obtained among higher education institutions.

Concluding Thoughts

Future Policy Challenges

There are a number of significant policy issues on the horizon for distance education. As the costs of higher education increase for consumers, institutions—especially public ones—will face increasing legislative pressures to reign in costs and develop more efficient educational delivery methods. Many legislators and other consumers will expect higher education to leverage technology to reduce delivery costs. Complicating the conversations around the use of technology in reducing educational costs while simultaneously increasing access will be shifts in the technical infrastructure of the United States. For example, the recent revocation of net neutrality rules creates the possibility that both

consumers and institutions could be placed in the position of paying more for broadband access. And in light of the European Union's recent enactment of its General Data Privacy Regulation, concerns regarding data privacy are also expected to take greater priority in the United States.

Complicating higher education's ability to navigate these challenges is an increasingly uncertain regulatory environment. Throughout the last three decades of higher education policy development, the reauthorization of the 1965 Higher Education Act (HEA) has served as the primary higher education policy development vehicle. However, as congressional politics have become increasingly partisan and legislation more difficult to pass, there has been a shift to using either litigation, such as what we have seen with accessibility, or Department of Education rulemaking authority, such as we have seen with regular and substantive interaction. As of June 2018, the reauthorization of HEA is several years overdue, and there is no indication that it will happen in the foreseeable future—effectively leaving the development of higher education policy, especially as it relates to distance education, devoid of one of its strongest policy tools.

Note

1. As of June 2018, 50 states and territories had joined NC-SARA.

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26

FUTURE OF WORK IN A GLOBALIZED WORLD

Relevance of MOOCs for Continuous Learning

Sheila Jagannathan

Education is the great engine of personal development. It is through education that the daughter of a peasant can become a doctor, that the son of a mine worker can become the head of the mine, that the child of a farm worker can become the president of a great nation. It is what we make out of what we have, not what we are given, that separates one person from another.

Nelson Mandela, 2010

The Power of Technology to Disrupt Learning Positively

The past is no longer a predictor of the future of work. At one end of the spectrum, there has been an assumption that once a person invests in education and applies the learning at work, there is a good chance of earning a livelihood that spans the person's working life. A few centuries back, it was learning the skills of a trade through apprenticeships; later it became one of acquiring credentials in a university or trade school for building human capital. At the other end of the spectrum are an estimated 200 million young people classified as NEETs—not in education, employment or training because their years of schooling haven't prepared them for anything more than jobs requiring very basic skills or muscle power (Figure 26.1). This was not because of disinterest, but instead because the school curriculum and teaching in public schools in many less developed countries do not provide comparable learning opportunities to those in developed countries. For example, a high school graduate in a typical developing country acquires only half the knowledge of a comparable student from Korea. NEETs today have limited job prospects in the informal sector, and represent in some countries, as much as one-third of youths without adequate access to high-quality learning even if there is an interest to build personal human capital.[1]

The good news is that the situation does not have to remain the same for the growing NEET populations in the decades ahead. Technology is rapidly disrupting the way work is designed, organized and implemented, and these have implications for future of work in rich and poor countries alike (Figure 26.2). For example, inexpensive sensors that can communicate with each other through the Internet of Things (IoT) churn out vast amounts of data on everything we use. Big data analytics, aided by artificial intelligence, enables us to tease out patterns in human behaviors and ecosystem stressors. Advances in robotics, 3D printing, blockchain technologies, nanotechnologies, and digital medicine are some of the many other areas where disruptive technologies have taken deep roots, thereby shaking the foundations of conventional perceptions of job security and career advancement strategies, and can even disrupt the NEET categorization.

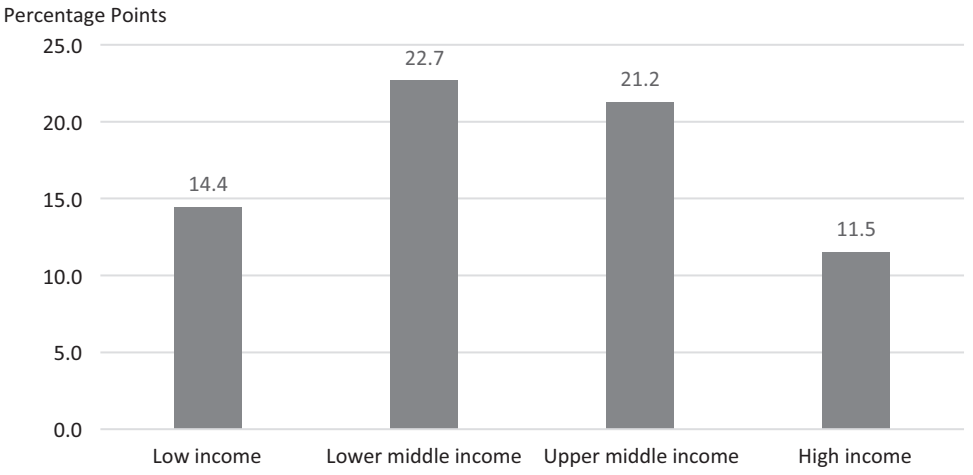


Figure 26.1 Average youth NEET rate by income group

Source: World Bank, World Development Report on Work; Concept Paper 2017

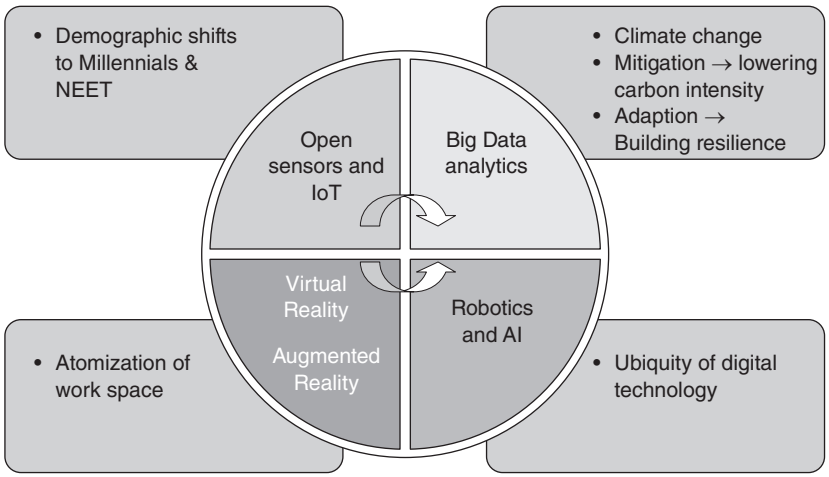


Figure 26.2 Forces disrupting work

The key point is that technology disruptions open up access to a vast virtual treasure trove of knowledge to any person interested in learning. Data analytics of mobile and conventional Internet users will enable pinpointed delivery of learning materials—just as Uber, Airbnb, and Amazon have succeeded in their specific domains of interest. The great hope is that any learner who has the cognitive ability to identify better income earning opportunities will engage in continuous learning, and apply what is learned to create value for himself or herself.

Demographic, social, and environmental factors add to technology disruptions. In advanced economies, the millennials already make up more than half the workforce, and this cohort is likely to grow as the youth bulge from developing countries transitions from NEET status to active participation. At the same time, many older persons, who would like to continue to work into their seventies because average life expectancies have increased, will need to reskill or perhaps even unlearn as more and

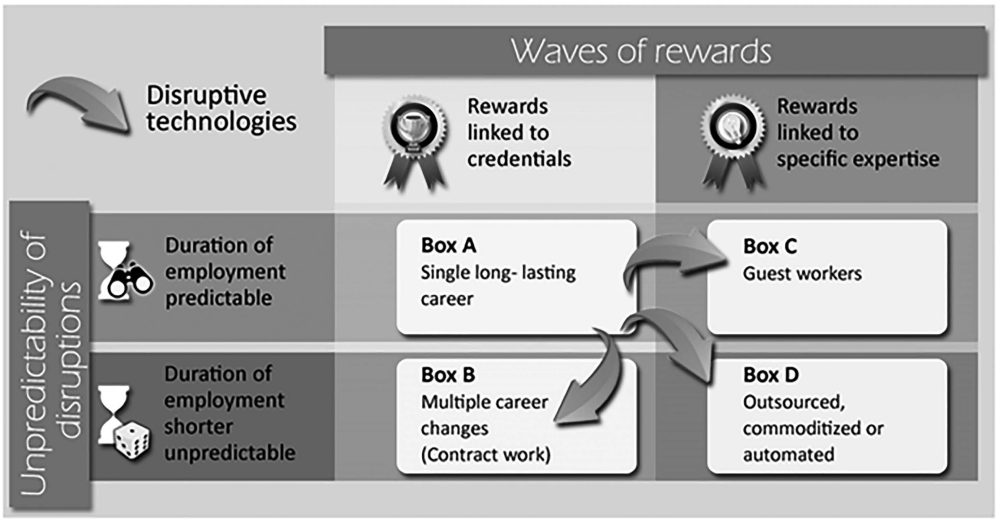


Figure 26.3 Unpredictability of disruptions vs. "waves" of rewards

more of work is tied to acquiring appropriate tech literacy. Individuals are also connected through social media and the Internet on an almost 24/7 cycle, leading many to question whether coming into a physical workplace every day is necessary, particularly in situations where commuting times extend for hours every day. Alternate work styles that permit flexible schedules and telecommuting are therefore finding favor. A person can be anywhere, any time, and still be fully engaged in the physical office work processes. Climate change also alters working arrangements. As more and more organizations are aware of carbon footprints caused by energy from fossil fuels, the greater becomes the willingness to promote telecommuting. Building resilience to unpredictable events such as hurricanes, droughts, etc., also requires working under unsettled weather conditions, making do with whatever resources are available. Climate change could also lead to loss of income earning opportunities in some of the poorest countries, and lead to large-scale migration to the global North. The future of work is therefore affected by not only technology but also by demographic changes, changing nature of the workplace and even climate.

Nature of technology disruptions: Technology forces are not only disrupting work arrangements, but also generating "waves" of value or rewards that crest and then rapidly dissipate when the first mover advantages are lost through widespread replication by others, including competitors who become familiar with that technology application.

Figure 26.3 categorizes four types of consequences that emerge:

- Box A describes work arrangements that link rewards to individuals to the human capital and credentials they offer the employer. This conventional working arrangement ensured a long-lasting career track leading to pensions/401(k) upon retirement.
- Box B represents a situation wherein the employment is offered short-term contracts, because the firm does not wish to be burdened with overhead costs (such as pension contributions, health insurance etc.), and/or faces excess supply in labor markets. The average tenure of a typical job in the United States has now shrunk to just 4.5 years.
- Box C describes situations wherein rewards are linked to specific expertise, (such as the migrant farm worker in California or the software programmer in Silicon Valley).

- Box D describes situations where technology is upending existing work arrangements in various lines of business (such as the gig economy affecting taxis, hotel demand, etc.). Jobs vulnerable to automation are estimated at 35% in the United Kingdom, 47% in the United States and 77% in China.

Overall, disruptive technologies are moving the future of work from the security of Box A to the unpredictability of Boxes B, C, and D. The waves of rewards would depend on the skills/competencies an individual offers the labor market. For example, tightening of supply for computer science expertise (Box B) may increase short-term remuneration or even longer contracts with improved benefit packages; shortage of software coders could increase reliance on guest workers on short-term visas (Box C), and windfall rewards to software app developers or outsourced contractors serving digital platforms (Box D).

The interesting point about these changes is that they also usually "level the playing field" for waves of rewards across geographies—wherever the digital network becomes accessible. For example, the huge growth in values of digital platforms in countries with large internal markets, like China and India, have rewarded many enterprising local firms and individuals. Moreover, as highlighted in the Barcelona World Mobile Congress (February 2018), by 2023 every adult in the world will be connected to the 5G mobile Internet, and therefore likely have access broadband data, and a wide menu of e-learning materials anywhere, any time. Therefore, anyone who doesn't wish to remain in the NEET category will be able to augment his or her learning applications and thereby join the future workforce in some of the categories in Figure 26.3 (likely to be Boxes C and D).

Significance of lifelong learning: Successful participants of the future workforce will be individuals (engaged in jobs that fall within Boxes B, C, and D), exhibiting cognitive ability to identify and ride each cresting wave of technological change. These persons exhibit four key traits: problem-solving abilities, creative thought processes, ability to adapt to fast-changing circumstances, and having an entrepreneurial streak in terms of taking risks to seize emerging economic opportunities generated by technological changes. The key phrase that describes such persons is "learning agility" in the form of cognitive skills, which enable them to navigate different cultural contexts, understand technological innovations, and deliver value for the remunerations they receive. Learning agility is defined as the ability to learn, adapt and create the requisite content.[2]

At the individual level, job access skills will require analyzing, interpreting, synthesizing and communicating, all of which require greater cognitive skills than in the past.[3] Machine augmentation of work will aid this process, but the ultimate responsibility remains with the concerned individual, who continuously re-learns—and even "unlearns," if necessary—to keep abreast with the rise and ebb of rewards produced by technology disruptions.

Boxes B, C, and D in Figure 26.3 also suggest that overall organizational structures offering work will transition from hierarchical to more atomized market-based institutions.[4] This process will accelerate as digital data platforms become more and more comprehensive in data coverage. Short duration "agile" teams will replace hierarchies, and persons fully vested in continuous learning will be much in demand in the workplace.

As far as national policymaking is concerned, the emerging work arrangements described in boxes B, C, and D alter the way individuals work, the very nature of the workplace, and also the geographic dispersion of the workforce. These trends require a complete re-imagination of the framework of laws, regulations, and other institutional processes so that the "reward waves" from disruptive technologies are both efficiently and equitably captured by labor force participants, as well as benefit the wider society. On the consumer side, the penetration of sensors, cognitive computing, big data analytics, and cloud computing equally upend behaviors in physical and virtual markets. Policymakers, therefore, need to be as much on the treadmill of continuous learning as individuals—in particular,

the challenge of scaffolding institutional capacity to fine-tune rules and regulations on a real-time basis, so that disruptive technologies benefit everyone, including those in the NEET category; and how best to manage and mitigate the underlying risks of large-scale layoffs of persons in mid-career.

An essential requirement for managing the future of work is a learning ecosystem that provides a common understanding of the opportunities and challenges for individuals, organizations, and policymakers. The challenge for the instructional designer serving these three categories of clients is on how to redesign learning for work, and deliver this any time any place across the world. If the learner is the center of attention, a menu of choices could be offered that supplement conventional courses. These include full-length e-courses, bite-sized or just-in-time learning, opportunities for peer learning through social platforms with facilitation, and massive open online courses (MOOCs).

Learning As an Accelerator to Leverage Technology Disruptions to Achieve Sustainable Development Goals

The previous section described how technology disruptions, along with other factors, such as changing demographics and climate, are affecting the workplace on an unprecedented scale, and across all geographies. The solution for individuals and institutions is to invest in continuous learning about how to create economic value from every cresting wave of technology changes. In this context, the World Bank Group (WBG) has invested significantly in digital and blended learning, relevant to the global development community, including policymakers, practitioners, academics, NGOs, and the general public. Through a virtual learning platform called Open Learning Campus (OLC), geographically distributed staff can refresh skills, learn about new innovations on a continuous basis, bridge knowledge gaps jointly with clients and co-create solutions to complex development issues, such as climate change disasters and managing epidemics.

Several drivers apart from technology disruptions led the WBG to invest in the OLC as a go-to destination for development learning. Principally, it is to share this global institution's vast repository of knowledge with the wider development community and thereby transform it into a "solutions bank." Internally, such a platform allows for continuous learning on technical, operational, and leadership topics to staff, enabling them to remain cutting edge in their respective fields while also acquiring new competencies that improve their overall effectiveness in the workplace. The OLC enables uniform career development opportunities for staff, many of whom are in geographically dispersed time zones. Externally, WBG client countries and partners are interested in learning and co-creating solutions, leveraging the repository of development knowledge—especially tacit knowledge—available in the institution.

The OLC is converting more and more of WBG's knowledge products and flagship reports (such as the World Development Report and country and regional technical reports) into easily accessible learning products. It is also unlocking tacit knowledge available with many of its staff, clients, and partners and packaging this information into absorbable content. Rapid advances in pedagogy and technology have made these innovations possible.

Since the launch, more than 4 million learners from 190 countries have visited the OLC, and approximately 6,000 digital learning activities have been designed and curated, gradually starting to realize the vision of the OLC. In the years to come, the OLC will continue to convene, connect, contextualize, and co-create learning for and with our clients and development partners, making the OLC not just a destination for just-in-time content, but perhaps even more importantly, a destination for problem-solving conversations and communities.

Flexible Learning Pathways for the Busy Professional: The OLC virtual platform leverages advances in pedagogy and technology to provide distinctive formats to match the evolving needs of learners through structured courses, bite-sized lessons, and vibrant communities of practice.

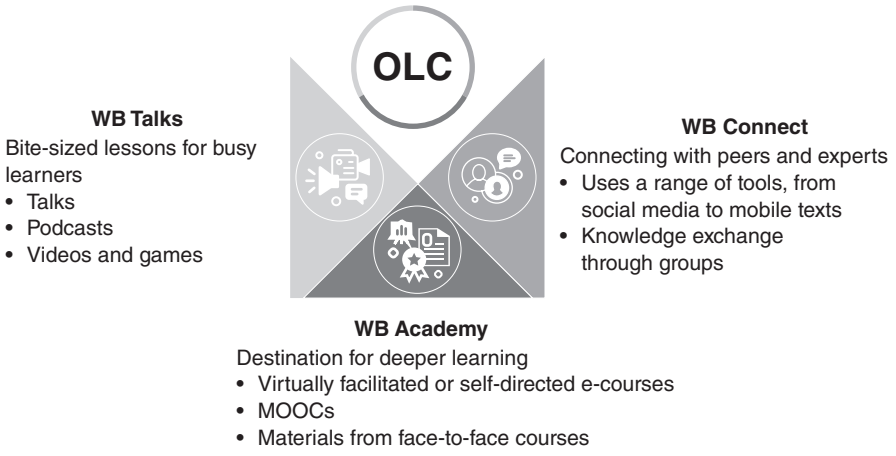


Figure 26.4 OLC's world-class learning ecosystem

The OLC harnesses educational technology, mobile capabilities, cloud computing, and innovations in e-learning to produce a world-class learning ecosystem through three "schools" of learning, with robust content, innovative delivery methods and access from anywhere.

The first school, WB Talks, enables the learner to explore nuggets of knowledge through talks, podcasts, videos, and games. These bite-sized learning opportunities are especially useful for the busy professional.

The second school, WB Academy, helps the learner to unpack deep learning related to development challenges and solutions through virtually facilitated or self-directed e-courses, MOOCs, and blended learning.

The third school, WB Connect, enables learners to engage with others through peer and expert learning to find crowd-sourced solutions to development challenges. Using a range of tools, from social media to mobile texts, knowledge exchange can be promoted between WBG staff, clients, partners, and global citizens. Examples of such communities include urban floods, smart cities, and integrated water management and land and house thematic groups

The OLC provides a rich library of learning courses and content across all sectors and regions that is curated from operational groups within the WBG and includes external global knowledge. The learning focuses on best practices and lessons from failures and is facilitated by global and regional experts on development topics from the WBG and the broader development community. The OLC also facilitates opportunities to learn from other client experiences (described as "South-South").

MOOCs: A Game Changer for Development

The OLC uses MOOCs because of their demonstrated ability to engage a large and diverse set of people globally on development challenges and provide a dynamic learning space to reach the broadest audience. The format of the MOOC is a powerful one since it provides people with free, open, and easy access to a wide variety of resources, democratizing knowledge and learning, and providing learning opportunities to nontraditional actors such as youth.

In this section, we will illustrate and highlight four MOOCs the OLC has launched in terms of participation trends, learner feedback and overall lessons learned that have wider applicability. The course design is highly interactive and allows learners to move from being a "crisis fighter" to a

proactive and systematic risk manager. Typically, a course's expert videos, animations, discussions, and social media channels encourage dialogue and give practitioners and policymakers practical knowledge of the topic being covered. Key pedagogical features of the course include:

- Video talks by renowned world experts.
- Animated cartoons that illustrate the course's key ideas.
- Specially developed online games, which require participants to make their own risk management choices as a way to apply the knowledge.
- Discussion forums and social media channels that enable learners to communicate and share resources, such as via Twitter using the relevant hashtags.
- Interactive YouTube Hangouts with international experts who are engaged in live Q&A sessions.
- Optional weekly exercises where participants create case studies from own communities.
- A final digital project, which ask leaners to summarize key takeaways from the course using multimedia.

MOOC: Managing Risk in a Changing World (Teaches Ways to Adapt and Flourish)

This MOOC raises learner awareness on how to effectively manage risks such as social upheavals and environmental damage, and to minimize crises, address setbacks, and unlock opportunities. The audience consists of development practitioners, policymakers, students, and even the general public, all of whom can learn how to identify, prepare for, and cope with risks to improve development outcomes. The MOOC was offered through Coursera's platform.

Content for the course was provided by the World Development Report 2014, along with additional up-to-date research and experience related to risk management in the developing world. The course synthesized the main messages and policy recommendations, including how to take a holistic, integrated approach to risk management. The MOOC also raised learner awareness on why it is important to both avoid crises and make the most of opportunities, why contributions from different economic and social actors are needed, and on government's role in scaling up these contributions.

MOOC Educates and Inspires: Creating Citizen Engagement Champions

This MOOC addressed the challenging task of ensuring citizen engagements in developing countries. This topic has been in the news with rising calls across the world for governments to become more open, accountable, and responsive. Citizen engagement is now recognized as being important to sustain development impact. There is an interest to learn more about methods on how to engage citizens in public decision making processes.

This MOOC utilized a collaborative approach with partners from around the world including four leading institutions: the London School of Economics, Overseas Development Institute, Participedia and CIVICUS. The goals were to demonstrate how citizen-centered governance, especially at the grassroots level, and the role citizens play can shape public policy and improve public service delivery and overall development results.

Four modules of the course provide a comprehensive overview of citizen engagement: (a) what it is and why it matters; (b) the role that citizens can play in shaping public policy; (c) the role citizens can play in improving public service delivery; and (d) the latest innovations that can enhance citizen engagement, such as information and communication technologies (ICT).

MOOC: Implementing Successful Public-Private Partnerships (Takes Learners Through the Project Cycle)

This four-week online course raised learner insights on the do's and don'ts of public-private partnerships (PPPs) transactions in infrastructure, notably in the transport, energy, and water sectors.

While the potentials of leveraging PPPs in infrastructure is well understood, many are not aware of how these contracts can be structured to work. Most of the time they are only publicly visible when something goes wrong, leading to negative perceptions.

To fulfill this critical learning need, the World Bank created a four-week online course that also ran through Coursera's MOOCs platform. Drawing experiences from around the world, the course's four modules covered: (a) the role of PPPs in reducing the infrastructure service gap; (b) how to establish a supportive framework to facilitate PPP projects; (c) ways to engage the right private sector partner; and (d) implementing and managing PPP projects. In this course, participants chose one of two tracks to follow—"PPP awareness" or "policy and practice"—and learned about current practices and perspectives on PPPs from over 20 government officials, practitioners, and other PPP experts from all over the world. The course also illustrated some of the powerful benefits that come from studying in a MOOC through networking with peers from all over the world, experimenting with digital and visual ways of representing knowledge about PPPs, and connecting the dots between PPPs and infrastructure needs around the globe.

MOOC on Digital Dividends: Strengthening the Analog Foundation of the Digital Revolution

Scaling learning and making it available anywhere, anytime is one of the "dividends" of the information and communication technologies (ICT) revolution. This course aimed for a broader goal of awareness raising: how the learner, their family, their business, their city, and their country could leverage the Internet and associated technologies to universalize access to global knowledge.

The MOOC explored the impact of the Internet, mobile phones, and related technologies on economic development. It demonstrated that potential gains from digital technologies are high, but often remain unrealized. It also suggested policies to expand connectivity, accelerate complementary reforms in sectors beyond ICT, and address global coordination problems. The MOOC's content and structure was based on the World Development Report 2016: Digital Dividends,[5] and was delivered on the edX platform. The six-week course began by introducing the concepts that underlie digital development—digital dividends and analog complements—and went on to explore what is needed to provide the population worldwide with Internet access and how analog complements can make it possible. Finally, the course explored how the Internet and associated technologies can benefit different sectors of the economy, businesses and individuals. It provided examples of how countries can leapfrog in their economic development by adopting and implementing their digital agendas. As with the other MOOCs, key features included video lectures, podcast interviews, multiple case studies and use of discussion forums to build learner collaboration.[6]

Pedagogical Underpinnings for MOOC

The pedagogical approach for MOOCs combines constructivist and social constructivist learning theories and research, and practical lessons drawn from experience, in order to produce learning that generates the greatest impact at scale. All courses are designed with a goal of developing local capacity, particularly in emerging nations, in areas related to finding solutions to complex development challenges such as risk management, climate change, public-private partnerships, and citizen engagement, to name just a few.

In OLC's learning curricula, we position expert videos, media, and text (in the form of short knowledge notes and brief, targeted reports) as complementary content—what is most important are the discussion, dialogue, and interactions around this content or the larger learning objectives. Thus, media content supports, rather than directs, learning. Courses become social engagements in learning, with a visible and encouraging instructional and facilitation presence.[7]

The pedagogy draws from the following learning theories, themes, or delivery modes:

1. **Socialized** (Bandura)[8] and **scaffolded** (Vygotsky)[9] learning emphasizes collaboration with highly social instructional activity. Through virtual facilitators, we ensure a visible expert/instructional presence that assists in modeling or scaffolding learning for those unable to do so by themselves, in addition to peer mentoring and support. The assessment focuses on capacity for learning rather than summative knowledge.
2. **Affinity groups** and **network development** (Gee)[10] builds on scaffolding and socializing learning with peer groups sharing mutual interests (affinities) and problems. We design opportunities for learners to engage their peers, and the resilience they pull from these groups helps them to sustain their participation in courses and find answers to national or regional problems.
3. Learning that is **constructed** through doing (Papert)[11] and tested through **experience** (Kolb)[12] helps learners develop models to understand the world around them. Our courses rely on real-world problems, with real data, case studies, and applications, avoiding perfunctory or hypothetical scenarios when possible. Projects and assessments deliver real-world application and opportunity.
4. **Self-directed** (or lifelong) learning[13] allows the learner to progress as needed. Many learners have clear ideas about what they want to learn and how they want to learn it, and we accommodate them through systematic design and predictable access to materials and activities. We try to accommodate both the potential for affinity and network groups and these self-directed learners.
5. **Multimodal** learning, whenever possible and authentic, forces cognitive translations of information, generating larger applied capacity in the long term. We want our learners to know the information, but more importantly, we want them to be able to articulate that knowledge in their local communities and that involves communication across different modes.

Learner Characteristics

The 4 MOOCs (involving eight course deliveries) discussed in the earlier section, enjoyed a high enrollment, with 130,438 learners enrolled from 201 different countries (Figure 26.5). The country with the highest number of enrollments was the United States, representing 14% of the registered student body, followed by India at 8% and Nigeria and Venezuela at 5% each. Of note is the high percentage of learners from Africa, especially given the challenge of connectivity, and relatively low rate of participants in the Latin America and Caribbean region. Most of the sessions were delivered in English, and one in French. This also greatly restricted the ability of NEET participation as most of them did not have adequate English language skills.

Almost two-thirds of the course registrations were from learners representing emerging economies. the rate of participation from emerging economies and developing countries was higher than Coursera's average of 33% MOOC registrants from emerging economies, and close to 44%. The participation from learners representing emerging economies was geographically widespread. While India and Nigeria had a high number of participants at 8% and 5%, respectively, the remaining large economies, such as United Kingdom, China, Mexico, Russia and Turkey, had only 9% learners in total.

Learners were highly educated, the median age 25–34, and a wide representation from government agencies, not-for-profit non-government organizations (NGOs) and other

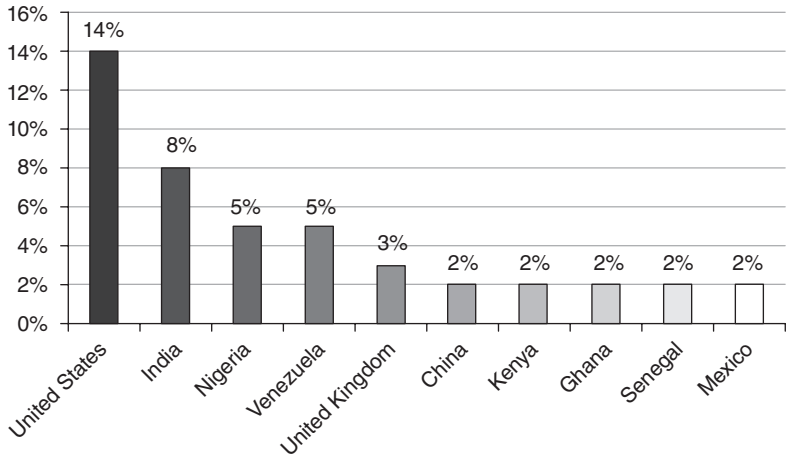


Figure 26.5 Learners by country (top 10 countries)

private sector companies. More than half of learners (65.4%) were in the age group 25–45, and only 11.6% of learners were age 24 or younger, while 23.1% were 45 or older. More than 91.3% had a university degree. Twenty-four percent were native English speakers, and 63.5% of respondents indicated that they are fluent in English. On the French version of one of the MOOCs delivered, 63% were fluent in French and 30% were native speakers. Of the total student body that specified their gender, 44% of learners were female and 56% were male, which is much higher than the global MOOC gender ratio of 33% female and 67% male. Figures 26.7 and 26.8 indicate that the MOOCs were accessed largely by learners less likely to belong to the NEET category described earlier.

The course greatly increased the knowledge/skills of learners, and they likely will apply the knowledge learned in their daily work. Specifically, 96% of respondents stated that their knowledge/skills increased as a result of this course, with more than 53.5% strongly agreeing. It is important that the course matter be relevant and useful to participants, and the course achieved that, with more than 84.2% of respondents rating its relevance, usefulness, and quality as "high" or "very high." In addition, 83% rated materials and resources that supported their learning as "high" or "very high." As far as course difficulty, 50% of learners rated the difficulty of the course as "just right." This perhaps reflected the learner aspirations of desiring to build human capital already acquired through schooling and work experience.

The majority of the student body were employed (67.5%), and 13.5% were self-employed. By type of organization, learners represented 13% government (clients of the World Bank/regulatory agencies), 23% other not-for-profit non-governmental organization (NGO), 15% other private sector company, and 5% World Bank. By scope of their organizations, learners represented 43% of international organizations, 41% national, and 15% subnational/local. Survey results show not many learners represented religious institutions, micro-credit/micro-insurance agencies, central banks, labor unions, and political parties.

More than half of learners surveyed (73%) received information about the course from friends, colleagues, and social networks, and from this and other MOOC platforms. This underscores the importance of marketing courses through World Bank staff in headquarters and country offices who work directly with governments of client countries, donors, and content partners and also through MOOC platforms. Others received information from World Bank websites, promotional material/newsletters, and blogs. Many learners enrolled after the course started. It seems important to continue actively promoting courses even after the launch. Registration

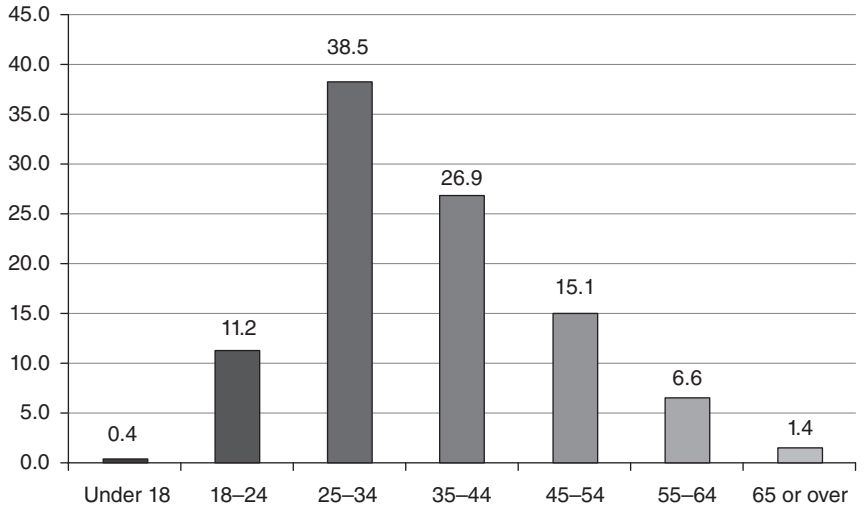


Figure 26.6 Learners by age

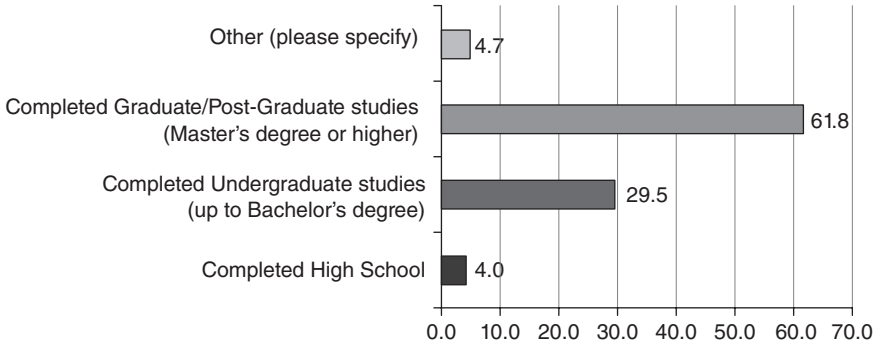


Figure 26.7 Educational background in percentage

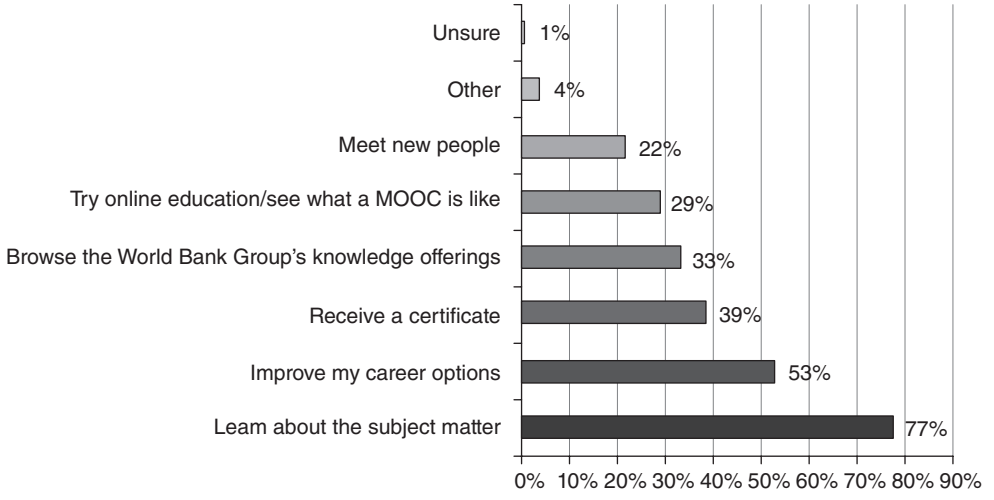


Figure 26.8 What learners wanted to achieve

continued even in the second and third week of the course. It then seems important not to put too many assessment deadlines in the first week or two of the course, or to keep assessment open till the last date of the course.

Learners expected to learn about the subject matter at the start of the course, and their expectations were fulfilled at the end. There was also a large percentage (53%) of learners who took the course to improve their career options, which shows the importance of the courses for professional and personal growth (Figure 26.8). The MOOCs were, however, not accessed by the NEET category, presumably because most such persons did not have adequate connectivity in the past to participate online.

A high percentage, 90.5%, of the respondents in the survey reported that they completed the course regardless of whether they passed the course or not. This is a very high percentage when compared with the average MOOC completion rates of less than 10%. Respondents agreed that the content was easy to access, more than 82% of respondents "agreed" or "strongly agreed" with this statement. Nearly half (43%) of learners spent 3–5 hours completing the core elements of the course. The course designers allotted 4–6 hours on average. "Work commitments" was a primary reason for learners not to have completed the course, selected by 59% of the participants. Overall, respondents were satisfied with the instruction/facilitation, more than 84% of respondents "agreed" or "strongly agreed" with this statement. About 23% of the respondents also reported too much time required as the reason for not being able to complete the course. Hence, it would be good to consider reducing the course materials or increasing the duration of the course.

Learner Feedback

Most learners plan to use the knowledge they received for advocacy, project work, career development or personal growth. Following are comments made by MOOC participants.

Advocacy examples:

I will advocate and push for better policies in my country to enhance the use of digital resources.

To change or influence policy and leadership issues in my community.

My work involves participation in policy making, involving civil Society and supporting capacity building of government as well as civil society representatives for stronger partnerships. I did learn from different examples and enjoyed sometimes familiar, sometimes new perspectives.

Being involved in the development sector, I plan to use these learnings in the grassroots level to encourage more participation in nation building.

Personal growth/private sector:

I will adapt some of the strategies to ensure that my company can make a change with relation to broadband affordability.

As an international trade and development professional, I am planning to use the knowledge I gained from this course to focus my career within the context of digitization and development.

I shall use the information to upgrade the training I give to stakeholders of PPP.

Academia

A useful tool to enrich my understanding of development goals and challenges, valuable tips to apply on the design of social and development projects.

For my research on how citizen engagement can support efforts on the fight against corruption.

I already have used what I have learned to create educational documents for the executive team at the government offices where I work. I foresee using the resources made available for the capstone project of my graduate degree.

I just wanted thank you to everyone who conceptualized and prepared this course. Actually, it is my first time to participate and I never thought that I can learn a lot from this particularly the instructional materials. I am now putting it in use by preparing a research paper on this.

Work and career development

In Venezuela, we are approaching a digital agenda project as a country, I'm going to be part of the team that will work on the project. All the information and learning experience that is in the course is going to be very useful.

The space I work in contains both digital and analog components of technology and innovation, both digital and non-digital—but at a domestic level. I want to raise this to an international level and this course information helped me find perspective and underlying components to move forward effectively in this digital age.

I would like to be able to apply what I learnt as I pursue my M.Phil in Political Science. In addition, this has helped increase my skill set and I hope to improve my career.

Sector practitioners feedback

It is clear that the analogue foundation must be considered before any digital revolution can occur. This has been the major reason for a lot of failed ICT implementation in my country. I plan to inculcate the knowledge from this course in the current project I am working on.

With the knowledge I have gained I can now enlighten others, especially in the education sector, by encouraging school owners to embrace digital forms of learning so as to improve learning outcomes both for teachers and students.

During the selection of PPP projects, it will help me to scrutinize.

The fact that Citizen Engagement will bridge the current gap of democracy. Citizens will not only vote and wait for the next election before having their say. They will also participate in all cycles of development programs.

Useful Lessons Learned to Inform Practice[14]

Lesson 1: Facilitation Is Critical to Learner Success

Facilitators provide a key role in the World Bank-designed MOOCs. Unlike most academic MOOCs, we placed a great emphasis on having the MOOCs facilitated by global and regional experts to guide, advise, and steer the discussions. These persons help participants connect an ongoing discussion with course content, steer a discussion toward a key point raised in the week's material, and provide links to relevant additional sources of information. An evaluation of facilitation practices revealed the explicit need for reflective practice, which was achieved through end-of-course facilitator reports. These reflective practices were bolstered with feedback gleaned from each subsequent MOOC, culminating in a robust reflective mechanism. Many of these reflections have proved useful for further training, and iterations on the pedagogical and design practices, for instructional teams.

Lesson 2: Pedagogy Extends Beyond the Course

As much of our pedagogy was crafted from the learning theories emphasizing socialization, network development, and experiential learning, we found that structurally the content, activity, and

assessment, all being highly peer-based, were generally efficient. Students engaged in peer activity, including assessments, throughout the course. Reflective questions and assessments asked them to reflect on their learning and how this might be applied in their local contexts. Although impressed with the level of networking and social learning taking place during the course, the lack of an follow-up environment after the course to encourage continued networking and socialization was felt to minimize many of the cascading effects that might have occurred as a result of the MOOC. Future MOOCs will try to address this feedback.

Lesson 3: Digital Artifacts and Peer-Driven Assessments

Given the enrolment for each MOOC spans from the thousands to tens of thousands, expecting facilitators to individually access and grade each learner is not feasible. Considering this constraint, as well as the desire to build socialized learning and networking directly into the course structure, the assessments were therefore provided by peers. This system worked well, with a few exceptions in the cases of zero grades (students who chose to give someone they were peer reviewing a zero grade) and perfect scores (students who gave an excessive number of students perfect scores). These anomalies were relatively low in volume and were fixed by allowing staff and facilitators to manually regrade those which were a potential problem or where issues were detected.

Assignments which comprised generally interviews, games, and digital artifacts were well received. Participants had the option of interviewing another individual in the course or a member of their local community. By providing two options—one within the course, and one outside—the assessment can be considered relatively fair and accessible. Some constraints to these assessments that were identified were primarily technological and from a digital literacy perspective. In some cases, interviewees did not wish to be identified, and instruction was provided to ensure that the perspective of the interviewee was represented strongly enough to give confidence to assessors that it was a real person. This sort of training on peer assessment proved to be critical to the success of the MOOC and was iterated on often in each of the MOOCs.

The accessibility and fairness of the final project, a digital artifact, is critical in the context of digital literacy. It asked participants to explain the key takeaways from the MOOC by creating an online resource that combines text and multimedia (audio, links, video, and pictures) in interesting ways. We received some phenomenally creative digital artifacts. In similar cases, other course participants stepped in and gave participants ideas on how to submit. While the culture of assistance within the class is laudable, proposing a simpler final assignment may indeed be valuable. These are adjustments are being considered.

Lesson 4: Measure Impact Through Local Application; Final Projects Bridge the Course to the Context

The impact of the courses themselves is, perhaps not surprisingly, an elusive measure. Most of what we have learned about the impact of the courses is drawn from the pre- and post-course surveys wherein learners are asked explicitly how they see this knowledge being applied in their local contexts. Evidence emerging from these surveys, while anecdotal in nature, is generally instructive as to how these MOOCs are helpful. This relates again to the demographics of the learner population. Some are using this learning to directly inform their professional practice, some are government employees looking to identify models in which to build stronger partnerships with both private enterprise and the public, some are educators looking to identify new content and models for teaching, and so on. The reasons for participating and the evaluation of the effectiveness of that participation suggest impact, but do not systematically define what shape that impact takes. Impact, as such, is as dynamic as the number of individuals participating in the course.

One method for identifying impact is more clearly articulated in the final projects required for each MOOC; it is through these digital projects that we begin to see the depth and breadth of the learning that has taken place. We see both increased capacity for affecting change in their local communities as well as transferable knowledge (many were specifically designed to bridge or network communities that were considered disparate, a demonstration of lateral thinking). Many developed projects of specific interest to their local communities, identifying not only their acquired knowledge, but also a capacity for crafting and articulating an appropriate application of that knowledge in a local context to help solve or mitigate a development challenge.

Lesson 5: Technology Can Both Inspire and Inhibit

Technologically, we also learned a great deal that has and will continue to inform the design of our future MOOCs and online offerings. As much of the pedagogy was both multimodal and digital in nature, particularly the final projects, it became clear that this would inspire some to represent what they learned in innovative ways, and would prove especially inhibiting for others who lacked the digital literacy skills to present their learning through digital media. The scope, depth, and overall quality of these final projects suggested that their structure was appropriate in meeting the learning objectives; it challenged leaners to broaden their capacity for explanation and representation. Yet, the technological expertise needed to execute them prevented some from fully participating.

This was evident in some projects being submitted but not being made public, some general confusion about hosting or even on how to produce a digital project, and some issues related to a simulation required for one MOOC whereby many students failed to submit the final assessment due to technical errors. There is an overall suggestion for the need for digital literacy instruction to precede the actual MOOC, or for a MOOC to be dedicated to digital literacy. This would be beneficial to any organization targeting underrepresented groups or those most affected by the digital divide.

Concluding Comments

The experience with the various MOOCs the OLC has been sponsoring suggests that the potential to support continuous learning and future work are significant. In particular, as every global citizen acquires access to the mobile Internet in the coming years, well-designed MOOCs, blended with other more targeted interventions (such as bite-sized learning, interactions with experts through webinars or discussion forums) enlarge the many interesting ways for a person to stay committed to lifelong learning. Individuals belonging to the NEET category could be supported with customized learning products. The development of skills can be undertaken by not only adapting apprenticeship programs with the insights offered by big data analytics, but also by providing NEET individuals with a customized individual needs assessment at very low unit costs, which also explores learning pathways for the persons to break out of this mold.

The key to linking the future of work to disruptive technologies lies in providing learners options much beyond MOOCs through apprenticeship approaches with the private sector and access to new job opportunities. Once a learner's appetite is whetted by awareness raising through a relevant MOOC, the next phase requires follow-up learning support through a portfolio of bite-sized courses, learning games, facilitated e-learning courses, internships, on-the-job learning and apprenticeships, etc., that are customized to the specific individual learner needs. Partnerships with leading academic institutions, and private sector and workforce development training institutions, will be key to blend the learning with the on-the-job experiences. Market-based responses are likely to emerge as big data analytics enables the delivery of customized learning solutions to meet individual needs. Over the next five years as the mobile Internet reaches NEET populations, the possibilities are

limitless for any person who is interested in improving his or her skills and competencies to benefit from the various technology waves.

One could visualize a whole new ecosystem of learning providers, in which individuals and firms offer a range of materials that could be downloaded by the learner. Through an expansion of the certification systems already being implemented by Coursera and edX, but also those offered through national and regional institutions, the learner could acquire credentials that fulfill the minimum educational criteria required to apply for future jobs.

Notes

1. Speech by Dr. Jim Young Kim, President of the World Bank, April 2018 at Spring Meetings Seminar.
2 Presentation by Heather McGowan at the World Bank Seminar on Future of Work 2018.
3. Quotation from Josh Bersin, "Catch the Wave", the 21st Century career *Deloitte Review* Issue 21, July 2017.
4. Williamson, Oliver E., in the classic study *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization* (1975). University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research argued that hierarchies like in corporations replaced markets for working arrangements in order to minimize transaction costs. The reverse trend currently taking place is because digital data platforms reduce the transaction costs of engaging in short-term contracts.
5. World Development Report 2016: Digital Dividends.
6. World Bank MOOC Evaluation Report, (2017).
7. Michael Sean Gallagher (2016). *World bank MOOC evaluation report*.
8. Bandura, A. (1977). *Social learning theory*, Englewood Cliffs, N.J.: Prentice-Hall, 1977. 247 pp.
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10. Gee, J. P. (2005). Semiotic social spaces and affinity spaces. *Beyond Communities of Practice Language Power and Social Context*, 214–232.
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27

ASSURING QUALITY IN DISTANCE EDUCATION

Accreditation, Regulation, and the Standards Movement

Julie Porosky Hamlin and Lori Williams

This chapter surveys various entities that have a stake in assuring quality in distance education (DE) at the postsecondary level and examines their respective roles, activities, and impacts. It begins with a consideration of the part played by accreditation through the work of the regional, national, and programmatic associations. The chapter acknowledges O'Brien's chapter "Accreditation: Assuring Quality and Fostering Improvement" in the third edition of the *Handbook of Distance Education* (2013), and reviews developments in accreditation relevant to distance education since the third edition was published.

The chapter also examines the expectations and activities of the federal government and state governments in the area of DE quality assurance (QA), with an emphasis on developments in recent years. These developments include the role of the National Advisory Committee on Quality and Integrity (NACIQI) and the U.S. Department of Education's initiatives related to assuring the quality of training and education offered by nontraditional providers. At the state level, a high-profile activity of recent years has been the effort by states to comply with a federal requirement for authorization and registration of DE providers by every state in which students enroll in distance education.

Finally, the chapter reviews the early and continuing work of other sponsors of approaches to evaluating and certifying quality in distance education. Such sponsors include individual institutions, college and university systems, higher education associations, and non-profit organizations, such as the Online Learning Consortium, Quality Matters, and the Western Interstate Commission for Higher Education (WICHE) Cooperative for Educational Technologies (WCET). The chapter also considers the QA role of learning management system vendors.

The chapter is concerned mainly with asynchronous distance education, often termed online education/learning or e-learning, and with developments in DE quality assurance in higher education in the United States. The word "quality" can have different meanings or implications, as is evident in the array of comments in a recent survey of expert opinion about what constitutes quality in online learning (Lederman, 2017a). For this review of QA provisions related to distance education, "quality" refers to levels of excellence in distance education as measured by the standards discussed in this chapter.

Accreditation's Role in Quality Assurance

History and Types of Accreditation

In most parts of the world, national ministries of education regulate and oversee quality assurance for postsecondary higher education, yet the United States has never granted such a role to its federal

government as part of its Constitution. Under the principle of federalism adopted by the United States, oversight of education at all levels is reserved to the states, and institutions are licensed in each state in order to operate legally. In most states, however, the licensure process is intended to certify that institutions meet a minimum threshold of viability, and does not provide criteria for the effectiveness of educational outcomes. Oversight of these effectiveness criteria, for more than 100 years, has been the role of non-governmental, decentralized, private accreditation bodies that themselves reflect the complex and varied nature of higher education in the United States (Eaton, 2015).

The purpose of accreditation in higher education is to assure quality and improvement, and institutions seeking accreditation must have processes that demonstrate their commitment to continuous quality improvement (Eaton, 2016). All U.S. accrediting bodies share these two primary purposes of quality and improvement, and the bodies are of three types: programmatic, national, and regional. As of 2013, these three types of accreditors, totaled 85, as recognized by the Council for Higher Education Accreditation (CHEA) and the United States Department of Education (USDE). Recognition of an accrediting body by the USDE's National Advisory Committee on Institutional Quality and Integrity (NACIQI) is important to institutions accredited by these bodies because the recognition determines a school's eligibility to participate in federal financial aid programs under Title IV of the Higher Education Act (USDE, 2017b).

Programmatic accreditation, as the name implies, is a specialized form of accreditation that provides quality assurance of individual programs, whereas national and regional organizations accredit whole institutions. Sixty-seven recognized programmatic accrediting bodies provide compliance standards for quality assurance (CHEA, 2015), and some offer specific requirements for programs taught at a distance. Because most specialized programmatic accreditors focus on competency standards for entry-level professionals, their quality assurance standards apply to all programs, whether offered through distance learning or in person. As a result, some programmatic accreditors have no specific standards for distance education (CHEA, 2002).

Perhaps the strictest of the programmatic accreditors with respect to distance education is the American Psychological Association's (APA) Commission on Accreditation (CoA), which, in spite of the growing acceptance of online higher education, provides for only limited forms of distance education in the programs it accredits (Clay, 2012). In 2010, the APA's CoA adopted an implementing regulation that prevents doctoral programs from becoming accredited if they are completely or primarily online. As of spring 2017, the APA's commission has accredited only one doctoral program with a distributed model in clinical psychology, at Fielding Graduate University, where the program has been accredited since 1991 (Fielding Graduate University, 2017). Although it has not revised its policy since 2010, the APA states that the commission is open to revisiting and revising this regulation as distance education evolves (APA, 2010).

National accreditation, the second type, serves a constituency of specialized, faith-related or career-related organizations. Of the aforementioned 85 total recognized accrediting bodies, four are faith-related and seven are career-related. Both CHEA and the USDE recognize all four faith-related accreditors (CHEA, 2015). Specialized accrediting bodies, including those that are faith-based, may or may not have different rules regarding distance education. The Association of Theological Schools' (ATS) Commission on Accrediting, for example, limits its accreditation of completely online programs to some Master of Arts programs (Association of Theological Schools, n.d.).

Of the seven career-related organizations, five are recognized by the USDE (CHEA, 2015). The pioneering career-related accreditor dedicated specifically to distance education, the Distance Education Accrediting Commission (DEAC), dates from 1926 and has been recognized since 1959. Founded as the National Home Study Council, it began as a way to guarantee quality and assure legitimacy in home correspondence programs, the earliest form of distance education. Its name was changed to the Distance Education and Training Council (DETC) in 1994 and then to DEAC in 2015 (Distance Education Accrediting Commission, n.d.). Another national accreditor, the

Accrediting Council for Independent Colleges and Schools (ACICS), lost its recognition by the USDE in December 2016, owing to charges that it lacked adequate accountability standards. This action was in part triggered by the failure of for-profit Corinthian Colleges, several of which offered online programs (Fain, 2016). As of late 2018, after a U.S. District Court judge found the 2016 decision invalid and sent the case back to the Secretary of Education, the Secretary has signaled that she will restore recognition of ACICS (Kreighbaum, 2018).

Regional accreditation, the third type of higher education accreditation in the United States, took the form of separate entities established within regions of the country to serve colleges and universities in their regions. The region-based organization owed largely to the need for peer site visits and the time it took peer reviewers to travel by train to conduct these site reviews in person at the beginning of the 20th century (Ewell, 2015). Regional accreditors, as a group, accredit most colleges and universities in the United States, and the membership of each regional association is made up of the colleges and universities in its region. As with national and programmatic accreditation, regional accreditation is optional; universities and colleges volunteer to become accredited, and their staff and faculty serve as expert reviewers of peer institutions. The types of institutions accredited by the regionals comprise a broad range, including small, faith-based, liberal arts colleges as well as large, research-intensive universities. Accreditation by the seven regional bodies is focused on quality assurance in support of the widely varying kinds of institutions that make up their memberships, rather than on adherence to a uniform set of measures, although support for some uniformity among the regionals is growing (Suskie, 2015). The seven regional accrediting associations are listed in CHEA's directory.

Regional Accreditors' Oversight of Distance Education

As discussed later in this chapter, early on in the history of distance education, standards were offered by such organizations as DETC (as DEAC was called prior to 2015), the American Council on Education (ACE), and WCET. As online education grew, the regional accrediting bodies became increasingly active in addressing QA in distance education. Although the regional accreditors have historically operated independently of one another, and continue to do so, they share common values and principles, increasingly collaborating and aligning expectations. The presidents of each of the regional accreditors form an organization for this purpose, called the Council of Regional Accrediting Commissions (C-RAC). The most recent statement by C-RAC of a commitment to shared expectations for the evaluation of distance education is the collaboratively developed *Interregional Guidelines for the Evaluation of Distance Education*, first published in 2002 and updated in 2011, which set forth "The Nine Hallmarks of Quality":

1. Online learning is appropriate to the institution's mission and purposes.
2. The institution's plans for developing, sustaining, and, if appropriate, expanding online learning offerings are integrated into its regular planning and evaluation processes.
3. Online learning is incorporated into the institution's systems of governance and academic oversight.
4. Curricula for the institution's online learning offerings are coherent, cohesive, and comparable in academic rigor to programs offered in traditional instructional formats.
5. The institution evaluates the effectiveness of its online learning offerings, including the extent to which the online learning goals are achieved, and uses the results of its evaluations to enhance the attainment of the goals.
6. Faculty responsible for delivering the online learning curricula and evaluating the students' success in achieving the online learning goals are appropriately qualified and effectively supported.
7. The institution provides effective student and academic services to support students enrolled in online learning offerings.

8. The institution provides sufficient resources to support and, if appropriate, expand its online learning offerings.
9. The institution assures the integrity of its online offerings. (C-RAC, 2011)

Each of the hallmarks is accompanied by bullet points of analysis or evidence that can be used by institutions or evaluators to demonstrate that the hallmark is met. In developing the Nine Hallmarks, C-RAC drew from WCET distance education guidelines and a report from the USDE sharing recommendations for quality in DE from interviews with staff at accreditation organizations (USDE, 2006). The USDE report included recommendations and potential concerns related to mission, curriculum and instruction, faculty support, student and academic services, planning for sustainability and growth, and evaluation and assessment. In addition to encouraging peer evaluators to use the Nine Hallmarks when evaluating distance education programs, regional commissions integrate DE-related topics in their own sets of standards.

The "Triad" of Roles in Distance Education Quality Assurance: The Accreditors, the States, and the Federal Government

Accreditors, state governments, and the federal government are the three separate actors that make up what has been dubbed "the triad," each playing a particular role in assuring quality in higher education, and in distance education specifically (Gaston, 2013). Congress established the Higher Education Act of 1965 (HEA), which has been amended and reauthorized since (USDE, 1998), most recently in 2008 as the Higher Education Opportunity Act (HEOA). Under the HEOA, for an institution in any state to be eligible to participate in federal programs, including financial aid, it must be legally authorized by the state to provide postsecondary education. This requirement assures a state role in authorizing postsecondary institutions and clarifies what is required for an institution to be considered legally authorized by a state. The HEOA also includes provisions for student complaints and consumer requirements, key to licensing institutions offering distance education programs.

Each state has its own agency authorized to license higher education institutions. Colleges and universities offering distance education programs to students in multiple states, therefore, are required to become licensed in each separate state. Securing licensure is a time-consuming and burdensome process. (For a list of state licensure agencies, see Pinnell [n.d.]). To assist institutions in securing licensure in other states after they have obtained licensure in their home states, the National Council for State Authorization Reciprocity Agreements (NC-SARA) was created by four regional higher education compacts. NC-SARA provides for reciprocity among states through a voluntary agreement to abide by comparable standards in DE offerings among participating states and institutions. The main goal of the reciprocity plan is to make it easier for students to take online courses from institutions outside their home state. Only the state of California had not yet joined NC-SARA as of late 2018. Not only does joining this organization assist in the administration of online programs across states, but it also provides consistent quality standards, efficiency, and lower costs for students, institutions, and states (NC-SARA, n.d.).

The USDE, seeking to close perceived loopholes in the "triad" system of quality assurance in distance education, released new rules for state authorization of postsecondary distance education in December 2016, augmenting the quality standards offered by NC-SARA and the states. These rules include an expectation that state laws regarding authorization are not in conflict with state authorization reciprocity agreements, that student complaint processes are documented, that distance education programs provide full disclosure of adherence to state licensure requirements, and that international locations be authorized by the appropriate foreign government agency (USDE, 2016c). The USDE announced a delay in implementation of these new rules in July 2018, pending negotiated rulemaking which may potentially revise the regulations (USDE, 2018).

Accreditors provide the "gatekeeping" function of quality assurance for the federal government so their member institutions may participate in federal financial aid programs. Reciprocally, accrediting bodies must meet criteria for recognition by the USDE, which have become more specific and stringent as the HEOA was modified through reauthorization and negotiated rulemaking (Ewell, 2015). In 1965, Congress established the National Advisory Committee on Accreditation and Institutional Eligibility (NACAIE)—in 1992 renamed the National Advisory Committee on Institutional Quality and Integrity (NACIQI)—to advise the USDE on polices related to recognition of accrediting bodies. In 2008, the HEOA was amended again to clarify the recognition process for accreditation agencies and the structure of NACIQI (USDE, 2016a). The federal assignment of the financial aid gatekeeping function to accrediting bodies makes compliance with accrediting standards of vital importance to institutions. To satisfy USDE requirements, all institutions that are regionally accredited must undergo a specific review of their DE programs to assure quality, within the context of their institutional reviews.

A Shift in Power and Focus

The balance of power and authority between and among the three members of the "triad" shifted in the mid-2010s amid calls for broad reform in higher education and specific reform in the operations of accrediting bodies. This plethora of calls for reform has come from policymakers, private foundations and think tanks, employers, and students and their families (Blumenstyk, 2014; Carey, 2015; Gaston, 2013; Otte & Goldstein, 2016; Suskie, 2015;), and includes recommendations for responding to new providers of education, including for-profit distance education, alternative forms of credentialing often offered at a distance, and new modalities like massive open online courses (MOOCs) (Ewell, 2015; Craig, 2015; Selingo, 2013). In the case of student learning that takes place online, the learning process is recorded, which permits institutions to more easily demonstrate the ways they support student learning and its outcomes, including graduation. Whether or not specific "bright lines," minimum threshold measures of effectiveness, are agreed upon, distance education is likely to be held to the same expectations regarding graduation rates, debt loads, and job placement rates as face-to-face higher education.

Arguably, the USDE has pushed the boundaries of its traditional authority in responding to calls for reform, as evidenced by its assertion of new rules for distance education (USDE, 2016c), on the one hand, and a new openness to experimentation and innovation on the other, through establishing experimental sites and new rules for competency-based education (USDE, 2017a). One of the department's Experimental Sites Initiatives, Educational Quality through Innovation Partnerships (EQUIP) was announced in the fall of 2015 as a means to permit nontraditional training suppliers access to federal financial aid. The purpose of EQUIP is to provide low-income students access to new models of education and training. The initiative's goals include testing innovative training methods that focus on outcomes-based quality approaches for a variety of American students who are not served by traditional higher education. Participating experimental initiatives were chosen in a competitive process, and EQUIP required that each partnership have three components: a higher education institution or system, a nontraditional education or training provider working with the higher education institution, and an independent quality assurance entity (USDE, 2016b). Nearly all of the programs at the eight sites selected included forms of distance learning.

As an example, one such experiment involved testing the validity of student assessments and the achievement of student outcomes at Thomas Edison State University in partnership with Study.com, a non-collegiate provider of online courses and study tools. The quality assurance entity reviewing this experiment is Quality Matters, an external quality validator whose work in providing a framework and process for review of online learning courses and programs has been well respected since the early 2000s (Snyder, 2016) (Quality Matters is examined later in this chapter).

The EQUIP program is one product in the later 2010s of the previously mentioned shift in the locus of power and "ownership" of key indicators of quality. Quality indicators traditionally used by accreditation bodies began to be broadened to include those espoused by the federal government and the general public it represents. Self-report and peer review, the pillars of accreditation, are increasingly being augmented by a policymaker focus on graduation rates, debt loads, and job placement rates (Eaton, 2017). As further evidence of the higher education community's preoccupation with quality assurance for nontraditional education providers, in 2016, a group of 11 concerned organizations, led by the Presidents' Forum and DEAC and including ACE and CHEA, formed the Collaborative for Quality in Alternative Learning (CQAL) to explore new structures for quality assurance that could be developed to accommodate and assist the alternative providers (Lederman, 2017b).

In the late 2010s, at the time of this writing, the balance of power and areas of focus in the definition of quality appear to be shifting again. While in the early and mid-2010s, the federal government emerged as the leader in defining quality through a narrow focus on graduation rates, debt load, and gainful employment, the accrediting bodies continued their emphasis on reflecting a wide range of expectations in their standards (Eaton, 2017). The current federal administration shows signs of changing this focused definition of quality through actions to lessen regulation on student loan lenders, for example, which critics argue might exacerbate the loan debt issue (Douglas-Gabriel, 2017). It remains to be seen whether and how the accreditors will serve as counter-weight to this shift in focus.

Continuing Examination of Regional Accreditation

Some criticisms of the accreditation process and its capacity to provide adequate quality assurance for distance education are situated in a larger set of questions about the effectiveness of the overall regional accreditation system. One question of overall effectiveness concerns the lack of consistency among regional accreditors. Each of the seven regional associations has its own set of standards used for accreditation self-study review reports by institutions and for peer evaluators who conduct the reviews. Among the seven, the sets of standards have common components, including standards that address DE, but no two are identical. Another inconsistency is the extent to which each of the regional accreditors uses the C-RAC hallmarks of quality in its guidance for member institutions and in its training or orientation of peer evaluators. A simple change to provide consistency would be the adoption of a common form for review teams to use to measure distance education against the hallmarks of quality.

In addition, qualifications for serving as peer reviewers of DE institutions and programs are not consistent across regional accrediting bodies and could be made so through collaboration among the regional bodies. In a call for accreditation transformation, Ewell suggested that accreditors consider providing better training to their peer reviewers to promote greater consistency and reliability in the application of reviews across institutions. Ewell also recommended that the regional accreditors consider accrediting courses and programs as entities, in addition to entire colleges and universities as they do currently, since many direct-to-consumer courses are now being offered by nontraditional providers (2015). As the reauthorization of the next HEOA approaches, regional accreditation in particular is increasingly buffeted by calls for reform, reinvention, and even replacement. Until a fundamental change occurs, however, meeting accrediting standards for quality assurance in distance education will continue to be a priority for institutions.

Distance Education Quality Standards from Other Providers: A Standards Movement

As asynchronous distance education matured as a medium and grew in popularity between the 1990s and the present, the quality focus changed. From the 1980s to the early 2000s, online courses and

programs were offered in significant volume by only a few colleges and universities that largely were innovative or entrepreneurial and outside the higher education mainstream. During this period, the focus was on assuring that online teaching and learning was "as good as" instruction that took place in the physical classroom. By the end of the first decade of the 2000s, online education had begun to be widely accepted as a teaching-learning format that could be as effective as face-to-face and not an inferior substitute intended for students who could not get to campus. As competition among DE providers intensified, the focus increasingly shifted to differentiating the quality of one college's DE offerings from those of another college.

A project known as the "No Significant Difference Phenomenon" was among the first to address widespread skepticism about distance education being equivalent in quality to instruction in the physical classroom. In *The No Significant Difference Phenomenon: A Comparative Research Annotated Bibliography on Technology for Distance Education* (2001), Russell compiled more than 350 research reports and papers documenting no significant difference in student learning outcomes that could be attributed to the format of educational delivery, whether face-to-face or at a distance. Since the print publication, new entries continue to be added through a website sponsored by WCET. The earliest efforts to define quality in distance education had a similar purpose: to show that, if certain principles were followed, DE could be as effective as traditional instruction.

Many of the early and more recent QA initiatives for distance education rest on Chickering and Gamson's seminal *Seven Principles for Good Practice in Undergraduate Education* (1987). Chickering and Ehrmann later applied the Seven Principles to technology-enhanced teaching and learning in *Implementing the Seven Principles: Technology as Lever* (1996). Some of the early sets of principles or standards designed by various organizations to define or measure quality in DE have endured by making the transition. Standards first devised to help ensure DE would be "as good as" now serve to distinguish between adequacy and excellence among DE programs.

Early Providers of DE Quality Standards and the QA Focus

Notable among pioneers in DE quality assurance that have evolved as online education has grown in prominence is the Online Learning Consortium (OLC), originally the Sloan Consortium (Sloan-C), a project of the Alfred P. Sloan Foundation. In 1997, the then-president of Sloan-C asserted that online learners "should have, at a minimum, an education that represents the quality of the provider's overall institutional quality" (OLC, 2017a, para. 1). Institutional quality would be demonstrated in five inter-related areas: learning effectiveness, access, scale, faculty satisfaction, and student satisfaction. The five came to be known as OLC's Five Pillars of Quality Online Education (OLC, 2017a). From the Five Pillars, termed OLC's Quality Framework, OLC's initiatives in online quality assurance have advanced to providing QA instruments for online education practitioners. The OLC Quality Scorecard Suite is discussed in the next section.

Other early QA standards sets include WCET's "Best Practices for Electronically Offered Degree and Certificate Programs" in 2002; the American Distance Education Consortium (ADEC)'s "Guiding Principles for Distance Teaching and Learning" in 2003; and the Southern Regional Education Board (SREB)'s "Checklist for Evaluating Online Courses" in 2006. In 2000, the Institute for Higher Education Policy (IHE) published "Quality on the Line: Benchmarks for Success in Internet-based Distance Education," a case study project supported by the National Education Association and Blackboard. Most of the organizations that were among the earliest to publish standards for quality assurance in DE supported distance education as an efficacious instructional medium, and the sets of standards they provided were welcome resources for the first-wave adopters of DE.

WCET's "Best Practices" were unusually influential. With a grant, WCET created the original version and then worked with states, accrediting associations, and the SREB Electronic Campus on

adaptations of the standards for the organizations' own use. The Council of Regional Accrediting Commissions funded an update of the "Best Practices" that was conducted by WCET with C-RAC's input, and C-RAC later undertook another update on its own, continuing to credit WCET as the originator of the standards (R. Poulin, personal communication, March 17, 2017).

The DE standards promulgated by the various providers had several criteria in common. Among the criteria were level of institutional commitment, as reflected by resources made available; coherence and comparability of DE curricula with traditional curricula; effectiveness of teaching in the DE medium and preparedness of DE faculty; provisions for student engagement and interactivity during the course; quality, comprehensiveness, and online accessibility of student support services; and the use of measures to regularly evaluate the effectiveness of DE offerings. As early as 1997, the Council for Higher Education Accreditation commissioned a study of quality assurance in distance learning programs. In *Assuring Quality in Distance Learning: A Preliminary Review*, Phipps, Wellman, and Merisotis (1998) addressed four questions:

- What is the universe of technology-mediated distance learning at the postsecondary education level, and how can the array of learning offerings in this country be categorized and described?
- What are the existing or emerging strategies for quality assurance of technology-mediated distance learning programs?
- How can the educational outcomes and experiences offered by these programs and institutions be measured?
- What specific policies and procedures are required for providing quality assurance of technology-mediated distance learning? (pp. v–vi)

Among the study's findings was a noticeable difference in the process for quality evaluation of DE programs as compared with the process for traditional programs. In DE programs, it was more likely that quality evaluations would be conducted by administration than by faculty, sometimes with the use of outside consultants in place of internal peer reviews, with a focus on market-oriented results (p. viii). In the assessment of student learning outcomes, the study found little evidence that learning outcomes were emphasized more in DE than in traditional instructional settings, though some DE providers used measurement processes intended to tie learning achievement to student performance. Finally, the study concluded that "the accreditation model remains a viable and effective means for public quality assurance in distance learning" (p. ix). As noted earlier in this chapter, this statement would be questioned in later years as the efficacy of regional (institutional) accreditation itself was challenged.

In 2010, the USDE Office of Planning, Evaluation, and Policy Development published a revision of a 2009 report presenting results of a meta-analysis of evidence-based practices in online learning, both postsecondary and K-12, with four research questions:

- How does the effectiveness of online learning compare with that of face-to-face instruction?
- Does supplementing face-to-face instruction with online instruction enhance learning?
- What practices are associated with more effective online learning?
- What conditions influence the effectiveness of online learning? (p. xi)

Among the key findings were that learners engaged in online learning performed modestly better than those learning the same material in face-to-face courses; that student learning outcomes were not affected significantly by different learning formats (e.g., purely online vs. blended); and that instruction combining online and face-to-face had a larger advantage than purely online instruction (pp. xiv–xv). The meta-analysis was the first widely reported study to find that online learning had advantages over face-to-face learning (Jaschik, 2009).

More Providers of QA and Evolving Standards as DE Matures

The earliest providers of quality metrics in distance education were associations and consortia concerned with advocacy for DE and with supporting the interests of their constituent institutions and DE practitioners. Some also developed QA standards with educational consumer protection as a primary or secondary purpose. As mentioned, with the maturation of DE as an instructional medium and growing acceptance of its viability, the focus shifted over time to differentiating quality among DE providers. With DE becoming more popular, a demonstrably strong DE program could aid in student recruitment. Beyond adhering to their regional accrediting associations' compliance standards for DE and the Nine Hallmarks of Quality discussed earlier, more and more institutions adopted additional quality assurance measures for their DE offerings. A number of institutions applied, often with internal adaptation, QA criteria developed by external sources such as those named in this chapter, and a smaller number of institutions developed their own QA criteria and evaluation processes.

Examples of Institution-developed QA

A number of institutions have created standards for distance education and applied them to their own offerings, or have adapted for internal use sets of standards from sources named in this chapter. Among widely known and emulated institution-developed QA mechanisms are California State University Chico's Quality Online Learning and Teaching (QOLT) Rubric for Online Instruction (California State University Chico, 2016), which has nine sections with 54 objectives for the design and assessment of online and hybrid courses, and the Open SUNY Course Quality Review (OSCQR) rubric and process (Open SUNY Center for Online Teaching Excellence, n.d.). The OSCQR rubric, a customizable instrument, incorporates 50 standards drawn from a variety of sources, including Cal State Chico's, and emphasizes course design and the measurement of course effectiveness from a Community of Inquiry (CoI) perspective. The CoI model identifies three elements central to an effective educational transaction—cognitive presence, social presence, and teaching presence—and has been influential among faculty and instructional designers as a framework for considering quality in distance education. (See Garrison, Anderson, and Archer, 2000.)

Quality Matters

Of external QA mechanisms adopted by colleges and universities, one had become dominant by 2010. Quality Matters (QM), a non-profit organization with the sole purpose of QA for distance education, began in 2003 as a three-year Fund for the Improvement of Postsecondary Education (FIPSE) grant project of the MarylandOnline consortium. The impetus for the funded project was a need to ensure comparability of quality among online and hybrid courses being shared among institutions in the 20-member consortium. Representatives from multiple institutions were tasked to come to agreement, at a detailed level, on what constituted "quality" in DE (Quality Matters, 2017). As part of the development of DE standards, the project team compiled all available research on components of DE quality. By the end of the grant period, the project "Quality Matters: Inter-Institutional Quality Assurance in Online Learning" had attracted the attention of institutions outside Maryland, and it became feasible to sustain the project by charging a fee to institutions that subscribed to QM services. From almost the moment QM subscriptions were made available, scores of institutions from throughout the U.S. joined, indicating a pent-up demand for a QA instrument for DE.

QM, like Open SUNY's OSCQR, which draws from QM, consists of a rubric of standards and an evaluation process. The QM Higher Education Rubric, which has been reviewed and revised

approximately every three years since the grant period and is now in its sixth edition, consists of 42 review standards in eight areas, each with extensive notations and instructions on how to apply the standard in evaluating an online or hybrid course. Courses are reviewed by a team of three faculty peer reviewers, one of whom must be a content expert and another of whom must be from outside the institution of the course being evaluated. Peer reviewers undergo training before being eligible to serve on a review team. Augmenting required reviewer training is a suite of optional professional development courses that explore aspects of the QM rubric and process.

A perceived strength of the QM standards is the community consensus they represent. The periodic updating of the standards that make up the QM rubric entails surveying representatives of all QM member institutions about any revisions needed in the standards themselves or improvements needed in instructions for implementing the standards. A committee of users representing different types of institutions leads the 18-month review and revision process. Public communiques emphasize that QM is more than a set of standards. Rather, QM is intended to be a comprehensive quality assurance process that is research-based and incorporates a structured peer-review process, benchmarks, and trained course review specialists.

As of 2018, QM had more than 1,100 member institutions or organizations in the United States and a few abroad. In addition to extensive involvement of QM users in the content of QM standards, the scale of adoption of QM by colleges and universities can be attributed in part to two other features of the QM approach to QA. One is the use of peer reviewers from within the QM community of institutions, which is more acceptable among faculty at most institutions than administrator or external consultant review. The other feature is the focus on course design vs. course delivery. By centering the QA review process on course design rather than on teaching performance, QM circumvents an institution's internal provisions for evaluating faculty effectiveness and stays in the neutral, formative-not-summative zone. QM's "design, not delivery" mantra has been challenged from its inception, however, by those who assert that "delivery" cannot be easily separated from design when evaluating a course's effectiveness and by others seeking a QM-branded instrument for evaluating faculty at their institutions. Responding to the perceived need for a teaching-focused instrument, in 2016 QM launched an online teaching certificate program made up of seven workshops designed to enable participants to demonstrate mastery in different aspects of online teaching.

The OLC Quality Scorecard Suite

The Online Learning Consortium (OLC), which started as Sloan-C with grant funding and now is sustained by member dues, continues to be a leading source of expertise and quality standards in the online education community. In response to growing demand, OLC has grown its research-based benchmarks and standards of excellence (K. Pedersen, personal communication, April 12, 2017). Building on its early work with the Five Pillars of Quality, OLC developed a Quality Scorecard Suite, which offers OLC members quality criteria and benchmarking tools in administration of online programs, blended learning programs, quality course teaching and instructional practice, course design review, and digital courseware instructional practice (OLC, 2017b). Designed to enable self-assessment, the scorecard is interactive and free to OLC members.

The earliest scorecard, Administration of Online Programs, launched in 2011, has been downloaded by more than 2,500 individuals or organizations (Pedersen, 2017, personal communication). It includes steps that can be taken to identify and quantify elements of quality in an online education program and provides metrics to evaluate quality indicators in such categories as institutional support, technology support, course development/instructional design, course structure, teaching and learning, social and student engagement, faculty support, student support, and evaluations and assessment. One of the newer scorecards is the OSCQR Course Design Review Scorecard, a course-level quality rubric designed through a partnership with Open SUNY. The rubric includes the categories

of course overview and information, course technology and tools, design and layout, content and activities, interaction, and assessment and feedback (OLC, 2017b).

In contrast with the Quality Matters process, which is concerned with the online classroom at the course or program level, the OLC Scorecard approach encompasses the whole institution. Through the use of all the scorecards available in the suite, a college or university can conduct a comprehensive institutional self-assessment of DE capability. As is made explicit in the Scorecard Suite website, the emphasis also is on providing instruments institutions can use to demonstrate online quality to their accreditors (OLC, 2017b). The consortium, unlike QM, is not solely focused on quality assurance. In addition to providing QA tools, OLC engages in a number of other online education-related activities. They include conducting multiple DE conferences annually, one with thousands of attendees; offering certificate programs in online teaching and instructional design and other professional development workshops and courses to support DE practitioners; hosting an online education journal; and co-sponsoring an annual leadership institute for emerging leaders in DE. Its recent expansion of the Scorecard Suite puts OLC in competition with Quality Matters, a development that could be considered a milestone. A few decades ago, distance education had few keepers of the quality flame. Now QA for distance education has become a movement and an industry, with competing providers.

The Impact of QM and OLC

The Quality Matters rubric of standards and review process and the Online Learning Consortium's Quality Scorecard Suite represent widely adopted mechanisms for assuring quality in distance education. Both emphasize continuous quality improvement. It is true of both that although the standards were initially created to evaluate online courses, harking back to the "as good as" proposition, the standards also are used by many institutions for the initial design of online courses. The spread of distance education beyond the early adopter, entrepreneurial cadre of institutions to the mainstream of public and private institutions occurred after the launch of QM and the Scorecard. Thus, these already well-established instruments were available for later-adopting colleges and universities to use in the construction of online courses. Building on the work of the early developers of QA standards sets and incorporating new practitioner tools, the Online Learning Consortium and Quality Matters have had a considerable impact in spreading best practice in distance education.

QA Standards in Learning Management Systems

Another development influential in introducing quality as well as uniformity in DE operations was the advent of the LMS. For the delivery of asynchronous online courses, a majority of colleges and universities use commercially developed electronic platforms known as learning management systems (LMSs). In a well-equipped classroom shell, the LMS provides essential components of an online course, including the student roster, course materials, interactive discussion forums, an assignment submission mailbox, etc. As quality assurance increasingly became an integral part of distance education, LMS providers included QA instruments in their products. Two of the most widely adopted commercial learning management systems use contrasting approaches to course quality assurance.

Blackboard, a leading LMS vendor, developed its own Exemplary Course Program (ECP) rubric that addresses best practices in four areas: course design, interaction and collaboration, assessment, and learner support. The rubric for each area includes criteria and examples to gauge whether a course is exemplary, accomplished, promising, or incomplete, and courses are evaluated by a group of Blackboard client peers (Blackboard, 2012). The Blackboard LMS also accommodates the use of external best practices rubrics, leaving it to institutional or departmental policy to determine whether the ECP or a different rubric will be adopted.

Desire2Learn (D2L), another leading LMS provider, uses a "Quality Assurance Rubric" for course design and development that is based on the Quality Matters Rubric. The D2L rubric's eight standards, nearly identical to QM's, are course overview and introduction, learning objectives (competencies), assessment and measurement, resources and materials, learner engagement, course technology, learner support, and ADA compliance (Dakota State University, n.d.). D2L has helped to promote Quality Matters, hosting a QM presentation at its 2016 annual conference and presenting information about QM on its website (Desire2Learn, 2016).

Today's QA Standards

In recent years, a consensus has developed around best practices in distance education. QA standards sets in use today are similar to one another and address common components of quality. The best practices also include some topics that would not have been present or as prominent in QA standards for DE developed in the 1990s and early 2000s. These new topics include accessibility and usability student authentication, incorporation of social media in course components, gamification, importation and use of external Web-based or downloadable teaching and learning tools in course design, and security and privacy. QA standard sets of the present and near future will also embrace competency-based education, adaptive learning, learning analytics, and open educational resources (OER), among other emerging topics.

A Multiplicity of QA Standards Providers

Despite consensus on the essential components of acceptable quality in distance education offerings, so far no single set of standards has emerged as the one all institutions have agreed to actively implement. The QA realm has no analog for, as an example, Universal Design for Learning, a widely accepted framework for accommodating learner differences in educational delivery (National Center for Universal Design for Learning, 2015). The C-RAC Interregional Guidelines' Nine Hallmarks of Quality comes closest to being an agreed-upon single set of standards, in that all institutions must be regionally accredited in order to be eligible for federal student aid; and the seven regional bodies have jointly endorsed the hallmarks. However, the regional bodies implement the Nine Hallmarks in different ways, and with varying levels of emphasis. The alignment of an LMS provider like Desire-2Learn, which has a large institutional client base, with a quality validator like Quality Matters may represent some movement toward consistency and hegemony in DE quality assurance.

Is DE different from traditional education in not having a single set of standards? It is the case that, beyond principles of good practice such as Chickering and Gamson's, no single set of quality standards exists for face-to-face higher education. As noted in this chapter, the regional accrediting associations resist the adoption of a uniform set of quality standards for all institutions. If anything, the publication and embrace of quality standards for distance education—standards that originally were intended to help DE be "as good as"—have raised the bar for quality expectations in face-to-face teaching and learning. Most of the standards for DE are applicable to the face-to-face format, and anecdotal evidence suggests that standards from rubrics intended for DE increasingly are being used by faculty and instructional designers in the development or evaluation of traditional courses.

Chapter Summary

This chapter has reviewed three primary entities that have a stake in assuring quality in distance education: accreditors, federal and state governments, and other providers. It began with a consideration of the unique part in QA played by the different types of accrediting bodies, emphasizing the all-important role of the regional accreditors responsible for accrediting entire institutions and,

as such, serving as gatekeepers for federal student financial aid. Though each of the seven regional associations follows its own practices for ensuring distance education meets expectations of quality, in 2002 the seven bodies also collaboratively developed interregional guidelines for the evaluation of distance education. Updated in 2011, the guidelines consist of "The Nine Hallmarks of Quality." As part of the exploration of regional accreditors, the chapter highlighted the "triad" of interdependence among accreditors, the federal government, and state governments in certifying quality in distance education programs.

The chapter noted the recent activism of the federal government, which under the principle of federalism has, with a few exceptions, historically maintained a hands-off posture with respect to education at all levels. The federal activism has taken the form of congressional calls for reform or replacement of regional accreditation because of high-profile failures of accredited institutions, including for-profit institutions that offer courses principally through distance education. The activism is also evident in recent initiatives of the U.S. Department of Education. A few years ago, USDE issued rules, still in contention, requiring state higher education coordinating boards to authorize and register out-of-state providers of distance education, a move that triggered the grassroots, voluntary formation of a state reciprocity mechanism to lessen the burden of compliance for states and institutions. USDE has also become active in sponsoring quality assurance experiments with the potential to benefit low-income students by making nontraditional providers of education and training, such as coding boot camps, eligible for federal student aid. Many of the nontraditional providers offer their programs through distance education.

Finally, the chapter reviewed other providers of quality assurance standards for distance education, some of which were among the first to advocate for DE and to develop instruments for measuring quality. Initially, a predominant reason for developing standards was to assert that education conducted at a distance was or could be equivalent in quality to instruction in the face-to-face classroom. The providers include higher education- and DE-related organizations, college and university systems, a quality validator, and learning management system vendors.

In the past few years, the DE standards sets produced by different organizations, including accreditors and governments, have reached a level of maturity and sophistication such that widespread consensus has developed around the characteristics of an effective distance education course or program. Most of the rubrics or checklists of standards have a core of standards in common. No single set of standards so far has been universally implemented by institutions, but the work of the regional accrediting bodies and the ubiquity of suppliers of DE standards make it nearly certain that colleges and universities today are designing and conducting distance education with an awareness of principles of quality.

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LEGAL AND RECENT COPYRIGHT ISSUES

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Introduction

In previous editions of this chapter, four topics within the copyright law were raised as major issues of concern to the distance educator and student. First, ownership issues regarding content created by educators and students can complicate delivery of that content into the distance learning space. Once ownership issues are resolved or at least accommodated, a second step is for all participants to understand and where possible position themselves and their institution to use the rules regarding damage remission to their advantage. Third, familiarity with the specific provisions of the copyright law related to distance education may lead to the conclusion that the benefit of such provisions are not worth the cost of fulfilling the conditions or obligations upon which use of the provisions is predicated. As a result of this conclusion, educators and students may turn increasingly to fair use to support their distance education activities. This chapter proceeds to update and review these topics, with implications of some major recent court cases and their implications upon the distance education environment.

Sorting Out Copyright Ownership Issues: Student, Faculty, or Institution?

The discussion of copyright ownership issues regarding instructor-created (outlines, study guides, other handouts, tests, articles and other publications, etc.) and to a lesser extent student-authored (term papers and other assignments, discussion board and other postings, etc.) content was discussed in detail in the first (Lipinski, 2003) and second editions (Lipinski, 2007) and is not repeated here. However, this chapter presents additional points and provides a case law update.

Ownership and Use of Student-Created Content

Content created by students is owned by the student-author. However, an argument can be made that the use of such content in the context of a closed or secure classroom, online or otherwise, is fair use. (Fair use is discussed in detail in a later section of this chapter.) Reposting by the instructor on an open website is likely not fair use, as this is outside the context of the classroom, but use of student work in other contexts in furtherance of the educational mission can be fair use, such as downloading a paper onto a flash drive so the instructor can grade it while traveling or using the

paper in a portfolio of projects for future students on a secure site. A recent appellate decision concluded that use of student papers without permission in a plagiarism detection database is fair use (*A. V. v. iParadigms, Ltd.*, 2009). However, use of student papers without permission on a term-paper-for-sale website is not (*Weidner v. Carroll*, 2010). This use did not serve a positive educational goal such as catching the student plagiarizer. Quite the opposite, it promoted it. Likewise, use without permission of student-created artwork in a commercial advertisement is also likely not fair use (see *Rainey v. Wayne State University*, 1998, p. 965: "alleged unauthorized use of the of plaintiff's paintings in a brochure distributed at the 1997 North American Auto Show"). The graduate student was in the Fine Arts program at Wayne State University.

Previous editions have discussed the legal justifications for incidental copying and internal distribution of student content inherent in a classroom setting, but as in any other application of fair use, it does come with some amount of legal uncertainty. One method of avoiding uncertainty is to require, at some point prior to the beginning of the programmatic experience, express consent from the student for use of his or her content in the context of the classroom and any other institutional environments whereby the content may be repurposed. One way to facilitate this consent is to have a click-to-agree mechanism the student encounters when he or she first logs into the institutional computing network or online course management system. Making the assent mechanism is a part of a general acceptable use policy (AUP) most institutions employ in some form or another and to which students are required to assent. The assent should apply to all computing and online activity while enrolled at the institution, or in the alternative, this assent could renew on a semester-by-semester or course-by-course basis within the online course management system.

The AUP is an opportunity to advise students of their general obligation under the copyright law not to engage in infringing activity (as well as not to break laws or violate other institutional codes of behavior). Such policy often indicates what sanctions the institution will impose for conduct that deviates from the agreed-upon standards.

It's not just a good idea, it's the law. Disclosure of such copyright information and sanctions is now required by section 1092 of title 20 of the United States Code as part of the annual institutional disclosures made to students under federal financial aid programs. The disclosures must now include a general copyright warning, information on the legal penalties for copyright infringement, and documentation of the institution's policies including sanctions regarding illegal file sharing using campus facilities (20 U.S.C. § 1092[a][1][P][i]-[iii]). Courts have upheld click-to-agree mechanisms under contract law principles. In the online environment, "courts have consistently held that the use of a website for such purposes of purchasing a ticket manifests the user's assent to the Terms of Use, and that such terms constitute a binding contract as long as the terms are sufficiently conspicuous" (*Druyan v. Jagger*, 2007, p. 237, citations omitted).

Ownership and Use of Instructor-Created Content

Determining who owns instructor work product is bit more complicated. The general rule under section 201 is that work made in the course of one's employment is owned by the employer, as it constitutes a so-called "work made for hire" (17 U.S.C. § 201[a]). But as discussed in the previous edition, there is a fair amount of case law which supports the idea that instructor-created educational content, specifically in the higher education setting, remains the property of the creator. This case establishing the judicial exception is *Hays v. Sony Corporation of America* (1998), where the court evaluated the pros and cons of institutional vs. instructor ownership, at least in the context of the university setting:

> The argument would be that academic writing, being within the scope of academic employment, is work made for hire, per se; so, in the absence of an express written and

> signed waiver of the academic employer's rights, the copyright in such writing must belong to the employer. But considering the havoc that such a conclusion would wreak in the settled practices of academic institutions, the lack of fit between the policy of the work-for-hire doctrine and the conditions of academic production, and the absence of any indication that Congress meant to abolish the teacher exception, we might, if forced to decide the issue, conclude that the exception had survived the enactment of the 1976 Act.
>
> *(*Hays v. Sony Corporation of America*, 1998, pp. 417–418)*

The *Hays* decision was based on a case decided the year previous by the same court (*Weinstein v. University of Illinois*, 1987).

Other cases from other jurisdictions have cited and followed the decisions in either *Hays* or *Weinstein* or both (see for example, *Pittsburg State University/Kansas National Education Association v. Kansas Board of Regents/Pittsburg State University*, 2005, p. 346). In denying ownership rights to K-12 instructors, the court acknowledged that such rights apply in higher education: "the 'academic tradition' granting authors ownership of their own scholarly work is not pertinent to teaching materials that were never explicitly prepared for publication by Shaul, as opposed to published articles by university professors" (*Shaul v. Cherry Valley-Springfield Central School District*, 2004, p. 186). The instructor-ownership right to academic work product, whether for the classroom or for scholarship, applies to instructors at institutions of higher education alone, and not all employees or to instructors in the K-12 setting.

Unless the institution resides in a jurisdiction where the courts have refused to recognize an instructor ownership exception to the statutory default of employer ownership, instructors at institutions of higher education can and should argue for ownership rights in content created in the context of the distance education classroom, as well as other teaching and scholarly content created in the course of their employment. Moreover, institutions should craft copyright ownership policies for instructor-created content that explicitly state that instructors retain copyright, while licensing to the university all the rights necessary to copy, reuse, and distribute the material for their institutional purposes.

Damage Remission: Lessoning the Sting of Infringement

Issues of liability (direct, contributory, and vicarious) and monetary damage awards (actual, statutory, and attorney's fees and costs) were detailed in the previous version of this chapter and are not repeated here. Limitations on statutory damages were also discussed (section 504), including the remission of all damage awards under section 512 (the so-called taken-down provision) and in specific relating to institutions of higher education under subsection (e) of section 512 (See also, Lipinski, 2006).

To review, under section 504(c)(2):

> [t]he court shall remit statutory damages in any case where an infringer believed and had reasonable grounds for believing that his or her use of the copyrighted work was a fair use under section 107, if the infringer was: (i) an employee or agent of a non-profit educational institution, library, or archives acting within the scope of his or her employment who, or such institution, library, or archives itself, which infringed by reproducing the work in copies or phonorecords.
>
> *(17 U.S.C. § 504)*

This immunity applies to both the employee as well as the institution. Once the immunity applies, the court must remit all statutory damages. The more the institution can position itself and its employees to benefit from this provision by understanding what lawful reproduction rights each

possesses, what is fair use and what is not, the better. This is a significant deterrent to litigation and positions non-profits and their employees as very unattractive defendants.

Section 512 details the take-down or disabling requirements when entities receive notice (actual or constructive, depending on the circumstances) of infringing conduct. Section 512(e) provides additional guidance for institutions of higher education, allowing the institution additional circumstances when it need heed such constructive notice. Section 512(c)(1)(a) and section 512(d)(1) indicate that in order for the monetary damage limitation to apply, the service provider must not possess actual knowledge that the material or an activity using the material on the system or network is infringing, or in the absence of such actual knowledge, not be aware of facts or circumstances from which infringing activity is apparent or upon obtaining such knowledge or awareness, acts expeditiously to remove, or disable access to, the material.

Actual knowledge can come from a notice received from the copyright owner or his or her representative, but this notice must contain the required elements identified by the statute. The first element of proper notice is "[a] physical or electronic signature of a person authorized to act on behalf of the owner of an exclusive right that is allegedly infringed" (17 U.S.C. § 512[c][30][A][i]). While the communication must be written, the first proviso suggests that its form can be an electronic writing or message. Next, the work that is infringed must be identified as well as the alleged material that infringes upon it (17 U.S.C. § 512[c][30][A][ii] and [iii]). These are two related but obviously separate pieces of information. Next, proper contact information must be provided, or as specified in the statue, "information reasonably sufficient to permit the service provider to contact the complaining party, such as an address, telephone number, and, if available, an electronic mail address at which the complaining party may be contacted" (17 U.S.C. § 512[c][30][A][iv]). Without this contact or follow-up, an incomplete (c)(3) notice may be used to trigger a similar removal or disabling requirement as it might provide sufficient "general" knowledge or awareness under either (c)(1)(A)(i) and (ii) or (d)(1)(A) and (B).

Oddly, the notice and removal or disabling provision of section 512 does not anticipate that the alleged infringement be proved in a court of law. However, to prevent copyright owners from willy-nilly erring on the side of accusation, forcing removal or disabling of copyrighted material unnecessarily, section 512(c)(3)(A)(v) requires that the copyright include "[a] statement that the complaining party has a good faith belief that use of the material in the manner complained of is not authorized by the copyright owner, its agent, or the law" (17 U.S.C. § 512[c][30][A][v]). So too, section 512(f), also creates separate liability for misrepresentations that are "knowingly materially" made, subject to civil remedy including damages, costs and attorney's fees. However, there a bit of legal wiggle room between a copyright owner that in good faith believes his or her works are being infringed and one who "knowingly materially misrepresents" that it is so infringed.

Recent case law suggest that the good faith statement by the owner or his or her representative claiming that use of the work is infringing must include some assessment of possible defenses such as fair use. In *Lenz v. Universal Music Corp*. (2008), the court observed:

> Accordingly, in order for a copyright owner to proceed under the DMCA with 'a good faith belief that use of the material in the manner complained of is not authorized by the copyright owner, its agent, or the law,' the owner must evaluate whether the material makes fair use of the copyright. An allegation that a copyright owner acted in bad faith by issuing a take-down notice without proper consideration of the fair use doctrine thus is sufficient to state a misrepresentation claim pursuant to Section 512(f) of the DMCA. Such an interpretation of the DMCA furthers both the purposes of the DMCA itself and copyright law in general" *(*Lenz v. Universal Music Corp*., 2008, pp. 1154–1155)*

The Ninth Circuit affirmed the decision on appeal: "We agree with the district court and hold that the statute unambiguously contemplates fair use as a use authorized by the law" (*Lenz v. Universal*

Music Corp., 2015, p. 1132). The appellate also reiterated that "if a copyright holder ignores or neglects our unequivocal holding that it must consider fair use before sending a take-down notification, it is liable for damages under § 512(f)" (*Lenz v. Universal Music Corp*., 2015, p. 1134). Assuming this assessment has been made, a proper notice can trigger a take-down or access disabling response, or in cases of a failed notice obligations nonetheless to undertake some action. This is the second reason why an understanding of fair use is critical in the distance education setting (the first is that the statutory damage remission of section 504 is dependent upon the existence of a reasonable belief that the reproduction complained of was fair use). Understanding fair use can assist an institution in determining whether the section 512 notice is adequate in that the sender of the notice should have considered fair use as a possible defense. The institution may believe the use complained of to be fair and so decides to restore the material's accessibility. The interplay of fair use and section 512 demonstrates the dynamic influence this concept provides in the distance education setting.

Specific Provisions Related to Distance Education

Another reason why an understanding of fair use is important relates to the usefulness of other provisions of the copyright law, or lack thereof. Section 110(2) grants additional display and performance rights to qualifying educational institutions, i.e., those that are non-profit and accredited. Distance educators might desire to record their teaching session (a video broadcast, a webstream, etc.) for later review by students. That recording might also capture not only the teacher's performance of the content (the lecture) but the copyright content as well (e.g., pages from a textbook, an illustration or map, a video clip to which the instructor offers explanation, etc.). The recording then also reproduces content protected by copyright. An instructor might also like to record his or her presentations ahead of time and in order to make the class session available to students 24 hours a day, seven days a week. The lecture might also include copyrighted content, such as several pages from a textbook, illustrations, or maps, a video clip (a "reasonable and limited portion" to which the instructor offers explanation, etc.). Section 112 allows educators to make such an ephemeral archive (of the distance education stream, for example) as well as preparation copies. These provisions come with an array of compliance-oriented obligations that many educators and institutions find burdensome and so fair use appears a more attractive recourse. Sections 110 and 112 were covered in the previous edition of this chapter (Lipinski, 2007; for a detailed study of the provisions, see Lipinski, 2005)

Regulatory Exemption for Use of DVDs in Education

Suppose an instructor or student would like to perform a DVD clip as part of an online classroom discussion. Suppose also that the DVD is protected by the encryption tool Content Scramble System (CSS), but that the instructor or student knows how to "get around" that control using the decryption software DeCSS. Circumventing an access control that a copyright owner places on his or her work such as CSS violates section 1201(a)(1). Trafficking in the anti-circumvention access or use "device" is also a violation under section 1201(a)(2) and (b). These rules, as well as a statutory exception, allow circumvention of an access control for purposes of curriculum development. 17 U.S.C. § 1201(d)(4). These provisions were discussed in Lipinski (2007) and in great detail in Lipinski (2006).

Regulatory activity has created an exemption to the anti-circumvention rules that may be very useful to instructors and students alike. As part of a current three-year cycle of rulemaking in 2015, the Librarian of Congress renewed the exemption on the following activity:

> Motion pictures (including television shows and videos), as defined in 17 U.S.C. 101, where circumvention is undertaken solely in order to make use of short portions of the motion pictures for the purpose of criticism or comment in the following instances: (iv)

> By college and university faculty and students, for educational purposes, (A) Where the circumvention is undertaken using screen-capture technology that appears to be offered to the public as enabling the reproduction of motion pictures after content has been lawfully acquired and decrypted.
>
> *(37 CFR Part 201 [2015])*

This allows distance educators to circumvent technological measures in order to copy the file for this specific purpose.

Fair Use in the Web-Based or Web-Supplemented Classroom

Instructors and students may arrive at the conclusion that the exemptions provided by sections 110 and 112, or the damage protection of section 512, offers little solace in the often zero-risk climate of the non-profit educational entity. It may be that the qualifying obligations are too confusing or burdensome to implement. Or it may be that the scenario envisioned by sections 110 and 112 simply does not apply to your facts, e.g., you are a for-profit online school. These problems dissolve when turning to fair use as the concept can be applied to any setting. However, fair use is not a defense to a section 1201 violation, though it might be a part of making the case for a regulatory exception under the current three-year cycle of rulemaking.

Using fair use in a frequent and efficient manner requires having a comfortable sense of the four fair use factors, as courts must begin by applying those factors. Fair use is a fact-dependent analysis, so the more cases and fact scenarios known, the more informed will be the decision making when applying the factors to a new set of facts. Moreover, having "reasonable grounds" for believing a use was fair is critical to securing the damage remission of section 504(c)(2) as discussed earlier. The remaining sections of this chapter focus upon an overview of fair use, the recent case law, and scenarios most relevant to educators and students.

The Four Fair Use Factors: An Overview

Fair use operates as a form of privilege in law, to undertake what otherwise in its absence would be an infringing use. Fair use is an equitable doctrine. Courts refuse to establish bright line tests. Section 107 provides a minimum set of factors to consider when determining whether or not on the whole the use should be deemed fair. There are four fair use factors: (a) the purpose and character of the use, including whether such use is of a commercial nature or is for non-profit educational purposes; (b) the nature of the copyrighted work; (c) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (d) the effect of the use upon the potential market for or value of the copyrighted work. These four factors are prefaced by a statutory preamble that lists a number of possible fair uses:

> Notwithstanding the provisions of sections 106 and 106A, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright.

However, a categorical determination, e.g., all uses in "teaching" are fair uses, is rejected by the very next sentence. "In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include . . ." The final sentence of section 107 reflects an amendment necessitated by a federal circuit court decision (*Salinger v. Random House, Inc.*, 1987) that suggested

that use of an unpublished work could never be a fair use: "The fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all the above factors" (17 U.S.C. § 107). Judicial evaluation of any particular circumstances must address all four factors and each factor's various sub-parts.

First Factor: The Purpose and Character of the Use

The first factor looks to the purpose and character of the use and by command of the statute inquires whether the use is of a "commercial nature or is for non-profit educational purposes" (17 U.S.C. § 107). Courts have had little opportunity to discuss the contours of what constitutes "non-profit educational purposes," but do consider whether a use is commercial or noncommercial, with the former weighing against a finding of fair use.

> The language of the statute makes clear that the commercial or non-profit educational purpose of a work is only one element of the first factor enquiry into its purpose and character . . . the mere fact that a use is educational and not for profit does not insulate it from a finding of infringement, any more than the commercial character of a use bars a finding of fairness.
>
> *(*Campbell v. Acuff-Rose Music*, 1994, p. 579)*

In other words, an educational use—even in a non-profit setting—can still be infringing! "[T]he crux of the profit/non-profit distinction is not whether the sole motive of the use is monetary gain but whether the user stands to profit from exploitation of the copyrighted material without paying the customary price" (*Harper & Row Publishers, Inc. v. Nation Enterprises*, 1985, p. 561). In other words, an educational use—even in a non-profit setting—can still be commercial!

A commercial use may be offset so to speak by a use that is transformative. Non-transformative uses tend to supersede the original work or operate as a market substitute, thus do not favor fair use. Transformative uses have the opposite effect. Fair use promotes uses that are complementary but not those that are substitutive:

> we may say that copying that is complementary to the copyrighted work (in the sense that nails are complements of hammers) is fair use, but copying that is a substitute for the copyrighted work (in the sense that nails are substitutes for pegs or screws), or for derivative works from the copyrighted work . . . is not fair use.
>
> *(*Ty, Inc. v. Publication International Ltd.*, 2002, p. 517)*

An example of a complementary work is a workbook or study guide. It is not a substitute for the original textbook or classic novel but is rather enhancing or complementary to it, the same way a book review is complementary, though a scathing review is not very complimentary.

Second Factor: The Nature of the Work

The second fair use factor considers the nature of the work. While many sub-factors such as age, price, etc., of the work could be hypothesized, courts focus on two sub-factors when determining whether the nature of the work favors or disfavors a fair use or the degree to which it favors or disfavors fair use. The first sub-factor assesses the publication status of the work. Fair use favors less the use of unpublished works, or, said another way, courts tend to be more protective of unpublished works. This occurs for two reasons. First, the historical context of copyright reveals the right of "first publication" as a significant right of the copyright holder. Second, since copyright is an economic

right, in the circumstance of an unpublished work, the copyright holder has not yet experienced the benefit of the marketplace. A second, more important, question is whether the work, based on its creative content, falls on the "thick" or the "thin" side of copyright protection. Courts have placed scientific and technical information, journal literature from the hard sciences (such as chemistry or physics, for example), on the far end of copyright protection, or so-called "thin" copyright, as opposed to poetry or works of fiction, on the opposite end. This is not to be taken as a slight against authors of those works. Courts rather focus on the factual nature of "thin" work. For example, in *American Geophysical Union v. Texaco, Inc.* (1994, p. 925), the scientific journal articles photocopied were "essentially factual in nature," but the chapter excerpts from various social science and humanities monographs used to compile the course-packs in *Princeton University Press v. Michigan Document Services* (1996, p. 1389) were "creative material." In both cases, the overall use was deemed not fair. Likewise, the nature of the newspaper articles posted to an electronic bulletin board in *Los Angeles Times v. Free Republic* (2000, p. *15) were "predominantly factual" and though the "defendants' fair use claim is stronger than it would be had the works been purely fictional" the use overall did not favor a finding of fair use.

Third Factor: The Amount and Substantiality of the Portion Used in Relation to the Work as a Whole

In recent years, this factor is less about rigid "how much can I take?" and more about whether the amount taken is reasonable in light of a good transformative purpose. Past educator and student fixation on a number or a percentage is now counterproductive. The significant question is whether the user is taking only as much as is necessary to accomplish that good (first factor) purpose. Using images or text in a searchable-retrievable archive of documents may indeed require that 100% of the work be used. This was evident in *Authors Guild, Inc. v. HathiTrust* (2014, p. 98), wherein the court stated that there are "no absolute rules" and the crux is to take "no more than is necessary." In the data-mining and search engine cases, it is acceptable to take the entire image or the entire text as the retrieving system will not function efficiently if 100% of the work is used: "it was reasonably necessary for the HDL to make use of the entirety of the works in order to enable the full-text search function" (Id. at 98). Note that in *Authors Guild, Inc. v. HathiTrust* (2014) and *Authors Guild, Inc. v. Google, Inc.* (2015), the full text of the work was not made available, only page number references or "snippets." Similarly in *Authors Guild, Inc. v. Google, Inc.* (2015) the creation by Google, Inc. of a searchable archive of full-text works was a fair use. While 100% of the works were included, the results offered a mere snippet of text surrounding the searched term to "evaluate whether the book falls within the scope of her interest (without revealing so much as to threaten the author's copyright interests)" (Id. at 218).

The third factor includes both a quantitative and a qualitative assessment. Determining the "amount" of the use is accomplished by examining the work "as a whole" and comparing to this the amount actually used. In one case, the district court found that "*Rachel Weeping* [the allegedly infringing second book written by Burchaell] includes 4.3 percent of the words in *Pregnant by Mistake* [the allegedly infringed first book]" (*Maxtone-Graham v. Burtchaell*, 1986, p. 1257). A second assessment is made to determine if the user nonetheless takes a substantial portion of the work in another sense: though the proportion of the amount of the work used is small, does the use nonetheless appropriate the most significant part of the work, its essence, or as courts have deemed it, the "heart" of the work? This inquiry is made because if the heart is taken, it is akin to a wholesale taking as it appropriates the creative core of the work such as revealing the surprise ending in the trailer for a movie (*Video Pipeline, Inc. v. Buena Vista Home Entertainment, Inc.*, 2004, p. 201), the signature guitar or bass line in a popular song (*Campbell v. Acuff-Rose Music*, 1994, p. 569), or a controversial political decision explained in one's memoirs (*Harper & Row Publishers, Inc. v. Nation Enterprises*, 1985). In

either assessment, courts are concerned that using too much of the work will undermine the need for the original. This relates to the next factor: the market impact.

Fourth Factor: The Effect of the Use upon the Potential Market for or Value of the Work

When assessing the market impact or effect upon the value of the work, again several considerations are required. First, the concept of market is not singular, e.g., sales revenue lost as reproduction of the work made purchase of an additional copy unnecessary. Assessing the impact the use may have on future primary markets and secondary ("reprint"), as well as derivative, markets must also be made. The decision to enter a secondary market, e.g., release of the first season of a popular television or cable series on DVD, is the copyright holder's, as is the right to develop derivative markets, e.g., a video game based on a blockbuster movie or vice-versa. These concepts are reflected in a recent controversy involving a print version of the popular Web-based Harry Potter Lexicon. No one would argue that publication of a reader's guide is a substitute for reading the original Harry Potter as there is "no plausible basis to conclude that publication of the Lexicon would impair sales of the Harry Potter novels" (*Warner Brothers Entertainment, Inc. v. RDR Books*, 2008, p. 550). However, the publication of the planned guide might impair the market for Rowling's two companion books (*Quidditch Through the Ages* and *Fantastic Beasts and Where to Find Them*):

> publication of the Lexicon could harm sales of . . . companion books. Unless they sought to enjoy the companion books for their entertainment value alone, consumers who purchased the Lexicon would have scant incentive to purchase either of Rowling's companion books . . . information . . . in these short works has been incorporated into the Lexicon almost wholesale.
>
> *(*Warner Brothers Entertainment, Inc. v. RDR Books*, 2008, p. 550)*

However, the Lexicon was not a derivative work:

> By condensing, synthesizing, and reorganizing the preexisting material in an A-to-Z reference guide, the Lexicon does not recast the material in another medium to retell the story of *Harry Potter* [as a theatrical staging of the series off-Broadway would do, for example], but instead gives the copyrighted material another purpose . . . Under these circumstances, and because the Lexicon does not fall under any example of derivative works listed in the statute, Plaintiffs have failed to show that the Lexicon is a derivative work.
>
> *(*Warner Brothers Entertainment, Inc. v. RDR Books*, 2008, p. 539).*

Section 101 defines a derivative work as "a work based upon one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted." A recent circuit court decision explained further the goal of the fourth factor: "The adverse effect with which fair use is primarily concerned is that of market substitution. Uses which are complementary, on the other hand, are more likely to be found fair because most authors would not want those uses to be impeded by a license requirement" (*Peter Letterese and Associates, Inc. v. World Institute of Scientology Enterprises, Inc.*, 2008, pp. 1315–1316). The meaning of market "effect" under section 107 may not be the same as its literal or ordinary meaning. The effect on the market that results from critique is not a concern of the copyright law.

Finally, as the recent case makes clear, the loss of licensing revenue does not equate to market harm if the use is deemed transformative, i.e., transformative markets are not a market subject to

the control of the copyright holder. As the court in *Authors Guild, Inc. v. HathiTrust* observed: "Lost licensing revenue counts under Factor Four only when the use serves as a substitute for the original and the full-text-search use does not" (2014, p. 100). The fair use cases demonstrate that transformative uses (and transformative markets) are not markets subject to the control of the copyright holder (*Bill Graham Archives v. Dorling Kindersley Ltd*., 2006, p. 615). If the use is fair, the copyright holder cannot claim market harm simply because no one will now pay to license the work (*Authors Guild, Inc. v. HathiTrust*, 2014, pp. 614–615; *Bourne v. Twentieth Century Fox Film Corp*., 2009, p. 510).

The best way to learn about fair use is to look at the cases. The following lists presents several dozen fair use decisions organized in hopefully useful and relevant (to the educational environment) clusters. Each case is listed with a short summary of the facts and the result. Each cluster is accompanied by a summary statement or assessment that can guide educators and students alike in future use of content protected by copyright.

Fair Use in Practice: Textbooks, Readers, and Other Publications

Copy-shop, course-pack, subject reader or anthology compilation and reproduction are typically not fair use as the use is not considered transformative, even though for the classroom, such use avoids paying the customary reprint price:

Blackwell Publishing, Inc. v. Excel Research group, Inc. (2009) (copy-shop serving University of Michigan students, accepted course-packs from professors, allowed student access to the master copy in order to make their own copy of readings using copy shop equipment and offering bindery service for student copies as well, not fair use).

Princeton University Press v. Michigan Document Services (1996) (reproduction of chapters in a course-pack, not fair use).

Merely reprinting or posting content to a website is not transformative and not fair use:

Society of the Holy Transfiguration Monastery, Inc. v. Gregory (2010) (Web posting by Denver Archbishop Gregory of translations made by monastery members of ancient Greek religious texts was not transformative and not fair use).

Lowry's Reports, Inc. v. Legg Mason, Inc. (2003) (reproduction of newsletters by financial advising corporation not fair use).

American Geophysical Union, et al. v. Texaco, Inc. (1994) (photocopy of scientific journal articles for file cabinet archive of employee not fair use).

Harper & Row Publishers, Inc. v. Nation Enterprises (1985) (publication by *The Nation* magazine of an excerpt from former President Ford's soon-to-be-published memoirs not fair use).

Preparation of a sequel or entertainment product based upon another work is not fair use, as these products are within the expected market for derivative works of the copyright owner, a right of the copyright owner to enter or forego.

Salinger v. Colting (2009, 2010) (use of Mr. C. character in *60 Years* not a fair use of the Holden Caulfield character from *Catcher in the Rye*).

Castle Rock Entertainment, Inc. v. Carol Publishing Group (1998) (creation of trivia games drawn from scripts of *Seinfeld* television show not fair use).

Fair Use in Practice: Criticism, Evaluation, Analysis of Interviews, and Other Primary Data

Criticism, review, evaluation, analysis of other content is a transformative, often complementary fair use, but take only as much as is necessary. Taking too much tends to undermine this alleged "good" purpose and also tips the third factor against the use; worse, taking too much also negatively impacts the market as it tends to substitute for the original or part of it.

Chicago Board of Education v. Substance, Inc. (2003, 2004) (criticism of standardized tests a good purpose but publication of entire test in order to demonstrate flaws not fair use, the value of the test [ability to use the test in the future] undermined).

NXIVM Corp. v. Ross Institute (2004) (use of seminar material to critique its content fair use even though sales of the seminar plummeted).

Sundeman v. Seajay Society, Inc. (1998) (reproduction of complete copy, near complete copy and paraphrase or quote of 4–6% of an unpublished manuscript for purposes of scholarship and research, among other purposes was fair use).

Mastone-Graham v. Burtchaell (1986, 1987) (use of published interviews in a new book with a different slant fair use).

Fair Use in Practice: Outlines, Training Materials, and Workbooks

Use of content in outlines, training materials, etc. tend not be derivative works and can be fair use as these items often complement or enhance use of the original work, but if too much is taken, courts will conclude the use is not fair as this tends to substitute for the original work.

Peter Letterese and Associates, Inc. v. World Institute of Scientology Enterprises, Inc. (2008) (use of excerpts from sales training book by Scientology Church to create instructional materials for new members based around the prior work not fair use, use of excerpts in internal administrative manuals fair use).

Gulfstream Aerospace Corp. v. Camp Systems International, Inc. (2006) (reproduction of repair manual in service program documentation fair use).

SCQuARE Intern., Ltd. v. BBDO Atlanta, Inc. (2006) (creation of abbreviated training manual based on content from previous seminars developed under contract not fair use).

Worldwide Church of God v. Philadelphia Church of God, Inc. (2000) (reproduction of *Mystery of the Ages* text by church founder for training and instruction by spin-off church not fair use).

Greaver v. National Association of Corporate Directors (1997) (use of material in similar seminar outline not fair use).

Rubin v. Brooks/Cole Pub. Co. (1993) (inclusion of "love Scale" in college psychology textbook fair use).

Fair Use in Practice: Illustration, Example, or Documentation

Taking the entire work can be fair use when done for purposes of illustration, example, or documentation, or to place an event in its historical context.

Gaylord v. U.S. (2010) (creation of postage stamp from photograph derivative of actual Korean War Veteran Memorial and not fair use of sculptor's original 19-statue monument. The stamp is a non-transformative, commercial use, with an "identical" purpose and character of the actual memorial (to commemorate the sacrifice of those who served) though no adverse market impact: "someone seeking to take a photograph . . . or otherwise create a derivative work would not find the stamp to a suitable substitute" for the memorial itself).

Bouchat v. Baltimore Ravens, LP (2010) (use of early Ravens "flying B" logo drawing in NFL "highlight" film not transformative, use of same logo in lobby team headquarters on "museum-like" display of a set of first season tickets and in two large photographs of team's first season, first-round draft picks (holding up jersey displaying logo) is fair use, demonstrating historical event of team's founding and first season).

Sofa Entertainment, Inc. v. Dodger Productions, Inc. (2010) (use of seven-second clip from Ed Sullivan Show with its host introducing the first national television appearance of musical group Four Seasons in Broadway play *Jersey Boys* to "serve as a historical reference point" is fair use).

Lennon v. Premise Media Corp. (2008) (use of segment from song "Imagine" in documentary "pro-religion" film fair use).

Healthcare Advocates, Inc. v. Harding, Earley, Follmer & Frailey (2007) (copy of screenshots from Internet Archive repository for use in litigation defense fair use).

Bill Graham Archives v. Dorling Kindersley Ltd. (2006) (minimized but complete image of several concert posters to illustrate timeline in rock music documentary book of band Grateful Dead fair use).

Antioch Co. v. Scrapbook Borders, Inc. (2003) (reproduction of stickers in a "how-to" book not fair use as the copyright owner also marketed "how-to" scrapbook).

Hofheinz v. AMC Productions, Inc. (2001) (use of movie clips and other content in documentary about iconic 1960s teen beach and rebellion movie studio fair use).

Images Audio Visual Productions, Inc. v. Perini Building Co., Inc. (2000) (reproduction of construction photographs for use in arbitration proceedings not fair use).

Los Angeles Times v. Free Republic (2000) (use of entire news stories though thin copyright on current events discussion board took too much, was not transformative and not fair use).

Higgins v. Detroit Educational Television Foundation (1998) (voiced-over gangster rap song excerpt in documentary film decrying gang and drug lifestyle fair use)

Fair Use in Practice: Access Tools Such As Guides, Indexes, Etc.

When works are used to create indexes, guidebooks, etc., these functional works are deemed transformative, as long as the amount taken is necessary to accomplish a good purpose such as full-text searching of the content; otherwise, this amount tends to substitute rather than enhance the need for the original.

Warner Brothers Entertainment, Inc. v. RDR Books (2008) (*Lexicon* of the fictional world of Harry Potter while not derivative took too much from series and two companion books, not fair use).

Ty, Inc. v. Publication International Ltd. (2002, 2003) (use of photographs of sculptural works (Beanie Babies) in a collector's guide fair use, use of photographs of sculptural works to illustrate scenes in children's book not fair use).

Kelly v. Arriba Soft Corp. (2003) (complete though thumbnail copies of Internet photographs in image index website fair use).

Twin Peaks Productions, Inc. v. Publications International Ltd. (1993) (detailed episode guide to television show not fair use).

Fair Use in Practice: Search Tools and Data Mining

Large scale and complete archiving and access of protected content can be fair use when the benefit serves some broader societal benefit where the amount is necessary in order allow for that benefit to be achieved.

Authors Guild, Inc. v. Google, Inc. (2015) (scanning and maintaining an archive of books in order to retrieve a user's search term and the surrounding text (the "snippet") was a fair use. Creating a location tool that informed users where their search term is located is merely providing information about a protected work. The copyright holder's right did not include the "right to exclude others from providing such information or services" (Id. at 225).

Authors Guild, Inc. v. HathiTrust (2014) (maintaining a database of digitized text to facilitate full-text searching in order to identify specific page reference to search terms and to provide access by users "with certified print disabilities" was a fair use. The purpose was "quintessentially transformative" as the full-text searching serves a "new and different function" (Id. at 97). "Providing access to the print-disabled is still a valid purpose . . . even though it is not transformative" (Id. at 102).

Fox News Network, LLC TVEyes, Inc., 43 F.Supp.3d 379 (S.D.N.Y. 2014) (Fair use Fox News broadcasts: TVEyes' search engine and display of result clips is transformative, thin copyright for news favors fair use, uses no more than is necessary to benefit to the public interest by assembling from scratch a library of television broadcast content, current licensing revenue a small part of overall revenue).

Fox News Network, LLC TVEyes, Inc., 124 F.Supp.3d 325 (S.D. N.Y. 2015) (user archive stored and accessible on TVEyes' servers is fair use, user ability to email to another user not fair use, user ability to download clip onto their own computer not fair use, and date-time searching is an unfair "content delivery tool" and harms the market for licensed or purchased reviewing of broadcast content). *Note:* this case is on appeal to the Second Circuit Court of Appeals (Dckt. # 15–3885).

Associated Press v. Meltwater U.S. Holdings, Inc. (2013) (use of a computer program to scrape news articles on the Web and provide excerpts of those stories, in essence the online equivalent to the traditional news clipping service, was not transformative; Because Meltwater failed to show that it takes only that amount of material from AP's articles that is necessary for it to function as a search engine, the use was not fair).

A. V. v. iParadigms, Ltd. (2009) (use of student papers in plagiarism detection database fair use). Compare, *Weidner v. Carroll*, 2010 WL 310310 (S.D. Ill.) (slip copy) (injunction against defendants who "operated term paper websites which specifically sold named Plaintiffs published papers on the website without their permission").

Perfect 10 v. Google, Inc. (2007) (cache of images fair use in order to facilitate search for images on the Web).

Field v. Google, Inc. (2006) (cache of images fair use in order to facilitate search for images on the Web).

Important Recent Court Cases

Two recent cases involved tertiary institutions. Both cases, one from Georgia the other from California, indicate that content providers are becoming more aggressive in enforcing and protecting their interests. Both cases also involve common practices in course and content delivery in distance education: e-reserves and streaming.

In *Cambridge University Press v. Patton* (2014), the federal appellate court considered "whether the unpaid copying of scholarly works by a university for use by students—facilitated by the development of systems for digital delivery over the Internet—should be excused under the doctrine of fair use" (Id. at 1238). The Georgia State University copyright policy allowed faculty to scan and upload chapter excerpts of books. Three publishers claimed 74 instances of infringement taking place over the three semesters of the 2009 calendar year. The lower court concluded that the publishers failed to establish a prima facie case of infringement in 26 instances and that the fair use defense applied in 43 instances. In only five instances was the use not fair.

The appellate court reviewed the analysis of the fair use factors by the lower court and found several flaws. Regarding the first factor (nature of the use), the appellate court concluded that while the use was not transformative, the significant issue was "truly a non-profit educational use" such that the use "places sufficient weight on the first factor scales to justify a finding that this factor favors fair use" (*Cambridge University Press v. Patton*, 2014, p. 1264). The court concluded that although the state university was a non-profit educational institution, the use was for profit as the institution failed to pay the "customary price," that is, a licensing fee. In looking at the history of fair use, the appellate court concluded that providing copies for classroom use is squarely within the use that Congress intended. The overall purpose of the use favored a finding of fair use. This conclusion was consistent with the lower court's analysis. Three-judge panels decide appellate decisions at the federal circuit level. One of the three judges authored a concurring opinion unconvinced that the first factor overall favored fair use, but concluded "that that the first factor weighs heavily against fair use (despite that the *user* is a non-profit university)" (*Cambridge University Press v. Patton*, 2014, p. 1289, Vinson, J., concurring, emphasis original).

When reviewing the second factor (nature of the work), the appellate court found that the lower court "erred in holding that the second factor favored fair use in every instance. Where the excerpts

of works contained evaluative, analytical, or subjectively descriptive material that surpasses the bare facts necessary to communicate information, or derives from the author's experiences or opinions" the lower court should have viewed this factor as neutral or "weighing against fair use in cases of excerpts that were dominated by such material" (*Cambridge University Press v. Patton*, 2014, p. 1270). Concurring Judge Vinson agreed with the conclusion of the majority.

The appellate court found the analysis employed in the third factor (amount and substantiality) troubling. The lower court applied a bright line test: fair use is favored when no more than 10% of work is copied or in the work having more than nine chapters, one chapter is the limit. The court found this mechanical, arbitrary, and "blanket 10 percent-or-one-chapter benchmark was improper" (*Cambridge University Press v. Patton*, 2014, p. 1271). By using a mechanical percentage and chapter test, the lower court "abdicated its duty to analyze the third factor for each instances" (*Cambridge University Press v. Patton*, 2014, p. 1272). In its discussion of the third factor, the appellate court rejected the mechanical counting contained in the so-called "classroom guidelines." However, Judge Vinson believed the classroom guidelines deserve consideration and observed that if applied to the facts of this case would support a conclusion that the third factor would also weigh against fair use (*Cambridge University Press v. Patton*, 2014, p. 1290, Vinson, J., concurring). The lower court did properly use the entire work including table of contents and index pages when making its assessment. However, the test used was incorrect; rather, the lower court should have examined each instance separately "considering the quantity and the quality of the material taken—including whether the material taken constituted the heart of the work—and whether that taking was excessive in light of the educational purpose of the use and the threat of market substitution" (*Cambridge University Press v. Patton*, 2014, p. 1275).

When reviewing the fourth factor, the appellate court agreed with the lower court that the use of the excerpts did not affect the market for the entire book. However, there is also the market for licensed excerpts to consider. The appellate court was quick to observe that the purpose of copyright is "not to furnish copyright holders with control over all markets. Accordingly, the ability to license does not demand a finding against fair use" (*Cambridge University Press v. Patton*, 2014, p. 1276). Otherwise, the analysis becomes flawed by circular reasoning if the rights holder could claim that "every potential licensing opportunity represents a potential market" (*Cambridge University Press v. Patton*, 2014, p. 1278). While the majority opinion observed that the so-called "copy shop" cases were not binding precedent, Judge Vinson would have given greater shrift to the analysis presented by those cases, especially *Princeton University Press v. Michigan Document Services* (1996), and would conclude that regarding the lower court both the "methodology and its analysis were flawed." Judge Vinson concluded that the use of the excerpts "fails under any common law 'big picture' adjudication of fair use and also fails on a work-by-work analysis under three of the four factors (while the remaining factor is either neutral or weighs against Defendants)" (*Cambridge University Press v. Patton*, 2014, p. 1291, Vinson, J., concurring).

In the words of the appellate court, the analysis by the lower court was "nuanced." Where a license was available, the lower court concluded that the loss of revenue from a failure to pay a license was small but nonetheless actual. Furthermore, widespread use could over time and instance "cause substantial harm to the potential market" (*Cambridge University Press v. Patton*, 2014, p. 1278). The appellate court agreed that where a license for digital excerpts could be obtained, the fourth factor weighed against a finding of fair use: "[W]here there is no significant demand for excerpts, the likelihood of repetitive unpaid use is diminished" (*Cambridge University Press v. Patton*, 2014, p. 1279). In the absence of a license, the fourth factor favored fair use. Again, Judge Vinson would disagree.

Finally, the appellate court concluded that the lower court erred when it gave separate consideration of the deterrent effect that unpaid excerpt use may have upon the creation of new works. This assessment should have been a considered under the first factor. Likewise, the impact of the "slight

diminution" in permission income should have been part of the fourth-factor analysis. Due to these errors, the appellate court reversed the decision of the lower court, sending the case back down for further consideration in light of the comments. And while the lower court ruled again, accommodating the appellate court's concerns but in a substantially similar fashion in favor of Georgia State, the case is not yet over. The publishers are challenging the application of the fair use factors by the lower court on remand (Brief of Amici Curiae American Library Association, Association of College and Research Libraries and Association of Research Libraries, filed in *Cambridge University Press, Oxford University Press, Inc., and Sage Publications, Inc.*, v. J. L. *Albert et al.*, No. 1:08-cv-1425 ODE [February 13, 2017]).

AIME v. the Regents of the University of California (or more specifically, UCLA) is a case that was closely watched for its implications for an increasingly common practice at educational institutions, that of streaming course-related video content to students. The practice typically involves making a digital copy of content purchased in physical formats, and then streaming the content to enrolled students through a secure server. It is seen as a technical substitute for bringing a video player and television into a physical classroom and playing the content for students (which would be perfectly suitable under the classroom exception found in section 110).

The original complaint was brought by the Association for Information Media and Equipment (AIME), a "national trade association whose mission is to help ensure copyright education and compliance," and by Ambrose Video Publishing, the company that sold UCLA the DVDs in question. The content of the DVDs was made available only to students registered in courses where the video was required viewing by the instructor. AIME and Ambrose claimed that copying and streaming this content to students constituted a copyright violation by the university.

In October of 2011, The U.S. District Court in the central district of California dismissed the case before it ever went to trial. The motion to dismiss was granted after UCLA's attorneys pointed out several flaws in the original complaint, and the amended complaint failed to address all of the issues raised by the court (*Association for Information Media and Equipment* [AIME] *v. Regents of the University of* California, 2012). First, AIME was found to not have standing in the case because it was not the actual copyright holder; only Ambrose had any legitimate claim. Also, as a public university and an agent of the state of California, UCLA enjoys protection from such actions due to sovereign immunity. Though the plaintiffs tried to get around that by naming individual actors at the university, including the UC president and other administrators, that tactic was rejected by the court. Additionally, plaintiffs tried to bring in additional state-level charges such as breach of contract and "unjust enrichment," which the court rejected, as the copyright infringement allegations preempted those claims.

Before the court reached the merits of the case, the case was dismissed on these technical grounds and "failure to state a claim." However, the court did address some aspects of the infringement claims within the order of dismissal (*Association for Information Media and Equipment v. Regents of the University of California*, 2012). Ambrose's specific claims of infringement were not consistent with the provisions of the law used to bring the claims, and Ambrose had actually licensed performing rights to the university in their license for the work:

> "Plaintiff's basic argument is that streaming is not included in a public performance because it can be accessed outside of a classroom, and as remotely as overseas. However, Plaintiff does not dispute that in order to access the DVDs, a person must have access to the UCLA network and specifically to the DVD. The type of access that students and/or faculty may have, whether overseas or at a coffee shop, does not take the viewing of the DVD out of the educational context. The Court finds that the licensing agreement allows Defendants to put the DVD content on the UCLA Internet network as part of the provision of

> the agreement that Defendants could 'publicly perform' the DVD content, and therefore Plaintiffs have failed to state a claim of copyright infringement over their right to publicly perform the DVD."
>
> (Association for Information Media and Equipment v. Regents of the University of California, 2011. p. *6)

In discussing whether streaming constituted a fair use the court concluded:

> After balancing these factors, the Court concludes that there is, at a minimum, ambiguity as to whether Defendants' streaming constitutes fair use and that it would not have been clear to a reasonable person in Defendants' position that its streaming did not constitute fair use. Notably, no Court has considered whether streaming videos only to students enrolled in a class constitutes fair use, which reinforces the ambiguity of the law in this area.
>
> *(*Association for Information Media and Equipment v. Regents of the University of California*, 2012. p. *6)*

The result of this case did not have much impact upon case law around these issues, as this is simply a district court ruling without wide-ranging implications on the merits of the case. But it does show the power of sovereign immunity in a public university, and the protections afforded all university actors who follow the exceptions in copyright law in good faith. It also reaffirmed that the copying necessary to place the content on a streaming survey was an "incidental fair use," an important reminder that fair use often works in concert with other exceptions and rationales found within the copyright scheme.

Ultimately, combined with the implications of the Georgia State case, the end result is a rallying call for universities to employ the exceptions to the greatest extent possible to enable access to content for students, and stand and defend their rights under copyright law with increased confidence in their position. It is easy to underestimate how risk avoidance by universities has led to higher licensing costs and/or reduced availability to needed educational content, both resulting in a negative impact upon student's educational needs.

Toward the Future of Copyright in the Distance Education Classroom

Once ownership rights have been determined, permissions may be required and obtainable for uses of content where the copyright holder is an instructor or student. Use of other content may require further analysis, but this should not be a deterrent for an institutional user or its employees. The copyright law contains safe harbors that are dependent upon the institution or user having some sense of whether the intended use of content is fair or not. This connection to fair use is explicit in Section 504. In addition, case law such as the *Lenz* decision have interpreted the Section 512 processes to require consideration of fair use before a take-down notice can be sent. Moreover, if an institution in receipt of a take-down notice is convinced the use is clearly fair, it may also suggest that fair use was not considered and a claim of misrepresentation under subsection (f) of Section 512 may be warranted. Fair use is critical in the distance education environment for another reason. The section of the copyright law targeting use of content in the distance classroom, Section 110, is in the opinion of the authors not very useful. Educators are preferring to rely upon fair use as demonstrated by the recent litigation involving Google, Inc. and HathiTrust book search systems. The recent on-point litigation (in terms of application to the distance education environment) in *AIME* and *Cambridge University Press* (and its continuing litigation) demonstrate that copyright holders are not reluctant to seek judicial remedy for alleged infringement. Second, these cases demonstrate that there is no definitive answer as to the extent to which fair use applies in the distance classroom. In

AIME (content streaming), the court provided only a cursory four-factor analysis seeing the first and fourth factors favored fair use; i.e., there was no market harm, the second factor was neutral and third weighed against fair use. The majority and concurring opinions in *Cambridge University Press* (e-reserves/online course platform) demonstrates that even among judges there is not agreement. Further case law will need to make these determinations and if judges continue to disagree, the issue may be ready for consideration by the U.S. Supreme Court. Even if one assumes these uses are fair but acknowledges that ambiguity exists, it should not deter the use of content; fair use is meant to be employed in the midst of such ambiguity. Reasonable interpretations of fair use place educators with the safe harbor found in Sections 504 and 512 and allow for the use of content in the distance education environment.

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Note

1. Prepared by Tomas A. Lipinski, J.D., LL.M., M.L.I.S., Ph.D. and Martin J. Brennan, M.L.S.: This summary is designed to provide accurate and authoritative information in regard to the subject matter covered. However, this information is NOT provided as a substitute for legal advice. If legal advice or expert assistance is required, the services of a competent legal professional should be retained. Reference to statute sections are to Title 17, United States Code, unless otherwise noted.

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29

STRATEGIES USED TO EVALUATE ONLINE EDUCATION

Patrick R. Lowenthal and Gayle V. Davidson-Shivers

Evaluation is the process of determining the merit or worth of something (Gusky, 2000). Evaluation has a long history not only in education in general (Hogan, 2007; Worthen & Sanders, 1973), but also in the practice of instructional design, distance education, and online learning over the years (Ely & Plomp, 1996; Gagné, 1987; Moore & Anderson, 2003; Reiser, 2001; Seels & Richey, 1994). Online educators (i.e., instructors, instructional designers, administrators) in particular have had a specific interest in evaluation because critics have questioned the merit or worth of online education from its inception. Among other things, critics have questioned whether online education is as good as traditional face-to-face education (Allen & Seaman, 2017; Jaschik & Lederman, 2014).) This skepticism sparked hundreds of media comparison studies starting in the late 1990s by supporters and critics alike (see Bernard et al., 2004; Means, Toyama, Murphy, & Bakia, 2013; Means, Toyama, Murphy, Bakia, & Jones, 2009; Meyer, 2002, 2004; Phipps & Merisotis, 1999). These studies sought to compare student outcomes between online and face-to-face courses. The majority of these studies showed that there is no significant difference between online learning and face-to-face learning. Despite this, online educators continue to try to show that online education is as good as face-to-face education (McDonald, 2002). To complicate matters further, during the last decade, there has been an increased focus on accountability at all levels of education (Rasmussen, Davidson-Shivers, & Savenye, 2011). Because of this skepticism and increased need for accountability, as well as a general desire to create high-quality learning experiences, online educators have grappled with the best approaches to evaluate online education and in turn, create, and deliver high-quality online education. In the following chapter, we describe some of the different ways that online educators evaluate online education.

Different Types and Foci of Evaluation

Generally speaking, there are two basic types of evaluation: formative and summative evaluation. Formative evaluation is conducted before a product is complete. According to Belanger and Jordan (1999), "the primary purpose of formative evaluation is to improve the product, service or process as it is being developed" (p. 186). In terms of online education, formative evaluation typically focuses on reviewing online courses at different times while courses are being developed—that is, formative evaluation generally happens before courses are fully implemented and used by instructors and learners (Davidson-Shivers, Rasmussen, & Lowenthal, 2018). While some have argued that formative evaluation is more useful than summative evaluation (cf. Belanger & Jordan, 1999; Oncu & Cakir,

2011), the increased use of course design standards and quality assurance frameworks (discussed later in this chapter) are likely enabling schools, colleges, and universities to conduct less formative evaluations than perhaps in the past.

Summative evaluation, on the other hand, is an evaluation that is conducted after a product—or in the case of online education, a course or program—is developed and implemented (Belanger & Jordan, 1999; Davidson-Shivers et al., 2018). Summative evaluations are often conducted by external evaluators (i.e., people not directly involved with the project). Summative evaluations are often focused on the effectiveness, efficiency, and appeal of a course, courses, or programs (Davidson-Shivers et al., 2018).

Online educators use formative and summative evaluation in multiple ways. For instance, online educators are increasingly evaluating how well a course is designed (Baldwin, Ching, & Hsu, 2017; Baldwin & Trespalacios, 2017). For instance, there are standards and quality assurance frameworks (e.g., Quality Matters) that are used to guide course development or to evaluate a course after it has been taught (Baldwin et al., 2017; Frydenberg, 2002). Online teaching is also often evaluated as a way to determine the merit or worth of the online instruction. Online teaching is usually evaluated using end-of-course evaluations (Lowenthal, Bauer, & Chen, 2015; Rovai, Ponton, Derrick, & Davis, 2006; Young, 2006). Finally, online programs are increasingly being evaluated (Rovai, Ponton, & Baker, 2008). Traditionally, online programs—at least at institutions of higher education—were simply evaluated through the general accreditation process that evaluated entire programs or universities as a whole (Rovai, 2003; Rovai et al., 2008). Over time, though, institutions—whether as a part of accreditation or as an independent evaluation—are conducting more extensive program evaluations of their online programs. In the following section, we discuss some of the current standards and quality assurance frameworks used by online educators to conduct formative and/or summative evaluations of online courses, online teaching, and online programs.

Standards and Quality Assurance Frameworks Guiding Evaluation

As enrollments in online courses grew during the early to mid-2000s, various standards and quality assurance frameworks were developed to help evaluate, monitor, and ultimately improve online education (see Feldman, McElroy, & LaCour, 2000; Frydenberg, 2002; Phipps & Merisotis, 1999; Southern Regional Education Board, 2006). Over the years, many of these standards and frameworks have been updated and expanded; at the same time, even with the existence of established standards, additional standards and frameworks have since been created to meet the needs of different contexts and organizations. In fact, there are currently dozens of different quality assurance frameworks focused on online learning (for a comparison of some of these different frameworks, see Baldwin et al., 2017; Baldwin & Trespalacios, 2017; Hastings & Rasmussen, 2017).

We use the phrase *quality assurance frameworks* in a general way to describe a variety of different quality assurance programs used by different institutions and organizations. Each of these frameworks, discussed in the following paragraphs, began with a set of "benchmarks" or "standards" identifying what quality online education looks like. These standards were then used to create a rubric or checklist that online educators use to create and evaluate online education (Hastings & Rasmussen, 2017; Lowenthal & Hodges, 2015). Phipps and Merisotis (2000) published one of the first lists of benchmarks /standards for online education; their benchmarks focused on the following domains:

- Institutional support.
- Course development.
- Teaching/Learning.
- Course structure.

- Student support.
- Faculty support.
- Evaluation and assessment.

Most frameworks are developed for a specific purpose and context. For instance, some standards and frameworks focus only on how an online course is designed (e.g., Quality Matters). Others focus on how an online course is taught/facilitated (e.g., during a given semester). Still, other standards and frameworks focus on a combination of course design and teaching (e.g., California State University Chico's Quality Online Learning and Teaching [QOLT]), because quality online education depends on both how a course is designed and how it is taught. And yet another group focuses not only on how courses are designed but also on how programs are managed and delivered (e.g., Quality Scorecard). Most of these frameworks, though, were developed for formal K-12 or higher education contexts, and not specifically for the type of online education used in corporate contexts.

In the following paragraphs, we briefly describe some popular standards and quality assurance frameworks. This review is not meant to be exhaustive or as an endorsement of any one framework; rather, it is supposed to provide an overview of standards and the corresponding quality assurance frameworks. Later in this chapter, we will discuss how these standards and frameworks are used to evaluate online course design, online teaching, and online programs.

Rubric for Online Instruction (ROI)

California State University (CSU) Chico developed the "Rubric for Online Instruction" (ROI) in 2002. CSU Chico used the rubric from 2003 to 2014. The entire CSU system now uses a new instrument, called the QOLT evaluation instrument, which is discussed in the next section. The ROI, though, was structured around the following six categories:

1. Learner support and resources.
2. Online organization and design.
3. Instructional design and delivery.
4. Assessment and evaluation of student learning.
5. Innovative teaching with technology.
6. Faculty use of student feedback. (CSU Chico, n.d.)

Each category has a few criteria under it. For instance, the "online organization and design" category focuses on the design of the course and includes things such as:

- "Course is well-organized and easy to navigate. Students can clearly understand all components and structure of the course." (CSU Chico, n.d.)
- "Aesthetic design presents and communicates course information clearly throughout the course." (CSU Chico, n.d.)

Quality Online Learning and Teaching (QOLT)

The California State University system created a new quality assurance framework in 2014 called the Quality Online Learning and Teaching (QOLT) program. The QOLT program centers on the QOLT evaluation instrument. The QOLT instrument was created after reviewing various frameworks (California State University, n.d. b). For instance, the creators of QOLT not only reviewed CSU Chico's ROI and Quality Matters rubrics, but also other popular frameworks such as the Community of Inquiry (Garrison, Anderson, & Archer, 2000) as well as Chickering and Gamson's (1987)

"Seven Principles for Good Practice in Undergraduate Education." The QOLT program is based on the following nine sections (the tenth section is optional).

1. Course overview and introduction.
2. Assessment and evaluation of student learning.
3. Instructional materials and resources utilized.
4. Students interaction and community.
5. Facilitation and instruction.
6. Technology for teaching and learning.
7. Learner support and resources.
8. Accessibility and universal design.
9. Course summary and wrap-up.
10. Mobile platform readiness.

Each section of the rubric includes a number of objectives as well as an example for each objective. For instance, Standard 1.1 states: "1.1 Instructor uses course environment to provide clear and detailed instructions for students to begin accessing all course components, such as syllabus, course calendar, assignments, and support files" (California State University, n.d. b).

Quality Scorecard Suite

The Online Learning Consortium (OLC), formerly known as the Sloan Consortium (Sloan-C), was founded in 1999. OLC is an organization focused on advancing quality online learning in higher education. One of the ways that the OLC does this is through its quality assurance framework called the "Quality Scorecard Suite." The Quality Scorecard Suite is a series of rubrics based on the OLC's "Five Pillars of Quality Online Education":

1. Learning effectiveness.
2. Faculty satisfaction.
3. Student satisfaction.
4. Scale.
5. Access. (Online Learning Consortium, n.d. a)

The OLC has described each of these pillars of quality online education in detail and has identified effective practices for each. For instance, the learning effectiveness pillar states,

> Effective practices that support learning effectiveness fall into (and can be explored under) the following categories: course design, learning resources, faculty development, learner characteristics, pedagogy, interaction (e.g., with content, faculty, other students, development of learning communities, etc.), assessment, and learning outcomes (e.g., student satisfaction, retention, achievement, performance, etc.) ("Learning Effectiveness" Section, para. 1).

The Quality Scorecard Suite's set of rubrics can be used to improve the quality of not only online courses but also online programs (see Shelton, 2011; Shelton, Saltsman, Holstrom, & Pedersen, 2014). OLC has scorecards/rubrics for the following different areas:

- Administration of online programs.
- Blended learning programs.
- Quality course teaching and instructional practice.
- Digital courseware and instructional practice.
- Course design review.

Quality Matters

Quality Matters (2014) is a widely used quality assurance framework in the United States. Quality Matters began under a Department of Education Fund for Improvement of Post-Secondary Education (FIPSE) grant in 2003. Quality Matters (QM) is now an international organization focused on improving the quality of online courses at the K-12, higher education, and professional education levels. QM has over 800 subscribers (Shattuck, Zimmerman, & Adair, 2014). QM, however, currently only focuses on the quality of how online courses are designed (as opposed to quality teaching or quality programs). QM's quality assurance framework centers around the following eight standards:

1. Course overview and introduction.
2. Learning objectives.
3. Assessment and measurement.
4. Instructional materials.
5. Learner interaction and engagement.
6. Course technology.
7. Learner support.
8. Accessibility. (Quality Matters, 2014)

Each of these standards has a number of related and more specific substandards used to evaluate online course design.

iNACOL's National Quality Standards

Last but not least, the International Association for K-12 Online Learning (iNACOL) is focused on improving competency-based, blended, and online learning at the K-12 level. iNACOL's work, like a number of the previously mentioned organizations, ranges from policy work to professional development, as well as research and standards development in an effort to improve the quality of online learning. iNACOL has published a number of reports focused on identifying standards and corresponding rubrics to improve online courses, online teaching, and online program development. Currently, iNACOL's website lists eight resources on national standards. Their popular reports include the following:

- iNACOL National Standards for Quality Online Courses (2011a).
- iNACOL National Standards for Quality Online Teaching (2011b).
- iNACOL National Standards for Quality Online Programs (2009).

Each report lists standards, which are chunked into different sections (as listed in Table 29.1), and corresponding rubrics. For instance, the iNACOL National Standards for Quality Online Courses (2011a) has a section called student assessment. Under student assessment, there are seven different standards focused on evaluation strategies, feedback, and assessment resources and materials. The third standard, under this section, states "Ongoing, varied, and frequent assessments are conducted through the course to inform instruction."

Most quality assurance frameworks, and specifically the standards and rubrics that often go along with them, can be used in a formative or summative manner. For instance, the standards and/or rubrics identify important criteria for example that are needed in well-designed online courses. While each set of standards emphasizes some things more than others (Table 29.2), you can see some commonalities (at least at the highest level). So for online courses to demonstrate merit and worth and thus be quality online courses, whether being formatively or summatively evaluated, they should

Table 29.1 Overview of iNACOL national standards for quality online courses

Quality Course Design	*Quality Online Teaching*	*Quality Online Programs*
• Content • Instructional design • Student assessment • Technology • Course evaluation and support	• Knowledge of effective instruction • Use technology to support learning engagement • Encourages active learning, application, interaction, participation, and collaboration • Clear expectations, prompt responses, and regular feedback • Models, guides, and encourages legal, ethical, and safe behavior • Aware of different academic needs and incorporates accommodations • Creates and implements valid and reliable assessments • Assesses learning progress by measuring student achievement of learning goals • Uses data to modify content and guide student learning • Interacts professionally with others to support students' success. • Arranges media/content to help students/ teachers effectively transfer knowledge	• Institutional standards • Teaching and learning standards • Support standards • Evaluation standards

Table 29.2 Comparison of popular quality framework standards

Rubric for Online Instruction (ROI)	*Quality Online Learning and Teaching (QOLT)*	*Five Pillars of Quality Online Education*	*Quality Matters*	*iNACOL Course Design*
• Learner support and resources • Online organization and design • Instructional design and delivery • Assessment and evaluation of student learning • Innovative teaching with technology • Faculty use of student feedback	• Course overview and introduction • Assessment and evaluation of student learning • Instructional materials and resources utilized • Students interaction and community • Facilitation and instruction • Technology for teaching and learning • Learner support and resources • Accessibility and universal design • Course summary and wrap-up • Mobile platform readiness (optional)	• Learning effectiveness • Faculty satisfaction • Student satisfaction • Scale • Access	• Course overview and introduction • Learning objectives • Assessment and measurement • Instructional materials • Learner interaction and engagement • Course technology • Learner support • Accessibility	• Content • Instructional design • Student assessment • Technology • Course evaluation and support

demonstrate characteristics such as sound organization, good instructional design, a focus on student assessment, and accessibility, to name a few.

Evaluating Online Course Design

Online educators have focused to a larger degree, as evidence in the previously mentioned standards and frameworks, on evaluating online course design. Online educators might choose to evaluate the design of their online courses in both informal and formal ways as well as in both formative and summative ways. For instance, CSU Chico's ROI and QOLT can be used in multiple ways. First, either rubric can be used when developing a new course as a roadmap or checklist to remind a course designer (whether that be a faculty member or an instructional designer) what should be included in an online course. Each section of the QOLT rubric, for example, provides specifics on what should be included in a well-designed online course. Course designers can also use the rubrics to self-evaluate a course after it has been developed (e.g., as a part of a summative evaluation). Finally, the ROI or QOLT rubric can be used as a peer review tool in which another person (either internally or externally) can review a course. In fact, there is an instructor, a peer review, and a student version of the QOLT rubric that others can use to improve their online courses (http://courseredesign.csuprojects.org/wp/qualityassurance/qolt-non-award-instruments/). Thus, instructors and/or designers (and really, all instructional support members) can design online courses and programs to meet specific standards and therefore use the standards and rubrics in a formative manner to improve the course as it is designed and developed, as well as to use the frameworks to conduct more formal reviews as a part of either a summative evaluation or accreditation review.

Quality Matters (QM) is one of the more popular quality assurance frameworks used to evaluate the design of online courses in higher education (cf. Adair & Shattuck, 2015; Legon, 2015; Shattuck, 2007; Swan, Matthews, Bogle, Boles, & Day, 2012). While each subscriber can arguably use QM differently (e.g., as criteria for formative or a summative evaluation), the basic QM process involves online instructors and/or course designers designing online courses to meet the general standards and substandards. Once the course is complete and taught for a semester, the design of the course is "reviewed" (i.e., evaluated) by three peer reviewers to see if each standard has been met. While most subscribers conduct informal or institution-specific QM course reviews at their respective institutions, QM also has a process where a course can undergo a formal QM review by external reviewers, for a fee, and in turn become a QM certified online course.

Regardless of the set of standards or quality assurance framework used, it is becoming commonplace to use a set of standards to guide the development of online courses and then to conduct some type of summative evaluation once a course has been developed and taught for a semester. Online courses are then usually revised and updated as a result of the feedback received from the evaluation.

Evaluating Online Teaching and Online Instructors

A quality online learning experience needs both a well-designed online course and a high-quality online instructor. Most of the recent and more popular quality assurance frameworks, though, focus very little, if at all, on online teaching. However, despite this, institutions have used various approaches to evaluate online teaching and online instructors. For instance, most institutions take a proactive or formative type of approach in which they either hire experienced online instructors or train their current instructors to teach online or a more reactive or summative type of approach where they use some type of end-of-course student evaluations to evaluate the quality of the teaching after the course has been offered. However, some also supplement these other types of evaluation with some form of classroom observation while a course is being taught. Each of these strategies are discussed in more detail ahead.

Hiring or Training High-Quality Instructors

Although some teaching practices have universality which are applicable to all situations, teaching online requires additional skills and abilities unique to that environment (Davidson-Shivers et al., 2018). As such, institutions tend to either try to hire experienced online instructors and/or find ways to train their own instructors on how to teach online. In fact, organizations and institutions often create professional development programs to help prepare instructors to teach online (Chen, Lowenthal, Bauer, Heaps, & Nielsen, 2017; Meyer, 2013). Colleges and universities use different approaches to train instructors to teach online. While an increasing number offer some type of "learning to teach online" seminar, whereby instructors learn the basics of teaching online in an online workshop (Chen et al., 2017; Meyer, 2013), a number of organizations offer online professional development (including complete certificate programs) that instructors or instructional support staff (e.g., instructional designers) can complete from a distance to develop additional expertise with online instruction. A growing number of universities also offer certificates, undergraduate degrees, and graduate degrees in instructional design and technology and sometimes specifically in online course design and online teaching. These programs are designed around professional standards. Organizations like the Association for Educational Communications and Technology (AECT), the International Society for Performance Improvement (ISPI), and the International Board of Standards for Training, Performance and Instruction (ibstpi) have all created professional standards to help guide and improve the practice of those involved with online instruction.

The organization ibstpi, which grew out of early joint task forces between AECT and ISPI (see: Davidson-Shivers & Rasmussen, 2007), has created standards (which they refer to as competencies) directly focused on online instruction. It currently has five different sets of competencies:

1. Evaluator competencies.
2. Instructional designer competencies.
3. Instructor competencies.
4. Online learner competencies.
5. Training manager competencies.

Each of these sets of competencies can help improve the quality of online instruction. For instance, the instructor competencies are based on the following five areas:

- Professional Foundation
- Planning and preparation.
- Instructional methods and strategies.
- Assessment and evaluation.
- Management.

Performance indicators have been created by ibstpi for each of these areas. However, one must pay to access the corresponding performance statements for each area. It is important to note though that ibstpi focuses more on individual competencies than course competencies.

Classroom Observations

Some institutions conduct classroom observations to evaluate online teaching (Bennett & Barp, 2008; Eskey & Roehrich, 2013; Puzziferro-Schnitzer, 2005). Using classroom observations to evaluate

instruction has a long history in K-12 schools, where principals regularly conduct classroom observations to evaluate the teachers in their schools (Blase & Blase, 1999; Cangelosi, 1991), as well in higher education (Braskamp & Ory, 1994). There are two main types of classroom observations taking place in online courses today. The first is an administrator-driven type of observation that takes place more at K-12 virtual schools and for-profit schools. These observations often take place multiple times in any given semester to ensure that the online instructors are regularly logging into the course and interacting with their students. The second type of classroom observations is more instructor-driven and peer review in nature; these often take place at public colleges and universities (Bennett & Barp, 2008; McKenzie & Parker, 2011; Swinglehurst, Russell, & Greenhalgh, 2008). This second type of observation typically takes place because an instructor wants to improve how he or she teaches online, and as a result asks a colleague to observe and evaluate their teaching. For instance, Penn State developed a "Faculty Peer Review of Online Teaching" process and form that is freely available for others to use (https://facdev.e-education.psu.edu/evaluate-revise/peerreviewonline).

End-of-Course Student Evaluations

Obtaining end-of-course evaluations by students is perhaps the oldest technique used to evaluate instruction (Lowenthal et al., 2015). Colleges and universities have been conducting some form of student evaluations of teaching for decades (Anderson, Cain, & Bird, 2005; also see Remmers, 1928; Smalzried & Remmers, 1943). While these evaluations began as a way for instructors to learn about their teaching (Anderson et al., 2005), they have become a way for institutions to evaluate teaching effectiveness (Kogan, 2014). Many question, though, how effective these types of evaluations are at evaluating teaching effectiveness. Research on the validity of student evaluations of teaching is ultimately mixed. However, one thing appears to be clear: while student evaluations might not effectively measure teaching effectiveness across all contexts, they do appear to be a good measure of student satisfaction (Boring, Ottoboni, & Stark, 2016; Lowenthal et al., 2015), which is an important thing to consider when evaluating online education.

Perhaps one notable drawback to student evaluations, however, is that they are generally conducted in a summative format at the end of the course which is too late to improve the learning experience for students who just finished the course. Regardless, institutions can and do use end-of-course evaluation data to identify which instructors needs more training, if a new instructor should teach a course, as well as to see if a course needs to be revised. Some institutions, though, do offer some type of midterm student evaluation of teaching which enable an instructor to get feedback in a formative manner half way through the course. Finally, other instructors might use a type of feedback survey to gather formative feedback themselves from their students during a given semester (Dobrovolny & Lowenthal, 2011).

Evaluating Online Programs

Finally, online educators, and specifically administrators, often conduct an evaluation on an entire program or programs. Rovai and his colleagues have written about evaluating distance education programs (cf. Rovai, 2003; Rovai et al., 2008; Rovai & Downey, 2010). Rovai et al. (2008) identified some key performance indicators for program evaluation which they grouped as the following:

- Virtual university.
- Faculty training.
- Content resources.
- Interaction resources.

- Student enrollment.
- Support services.
- Engagement.
- Peer revaluation.
- Student evaluation.
- Course adjustments.
- Persistence.
- Student achievement. (p. 115)

Rovai and Downey (2010) later identified the following seven factors why programs fail, which could also be used as criteria to guide a formative or summative program evaluation:

- **Factor 1:** Planning.
- **Factor 2:** Marketing and recruitment.
- **Factor 3:** Financial management.
- **Factor 4:** Quality assurance.
- **Factor 5:** Student retention.
- **Factor 6:** Faculty development.
- **Factor 7:** Online course design and pedagogy.

However, since that time, OLC and iNACOL have developed their own rubrics or guidelines to guide online program evaluation. For instance, the OLC's "Administration of Online Programs" rubric has various criteria separated under the following categories:

- Institutional support.
- Technology support.
- Course development/instructional design.
- Course structure.
- Teaching and learning.
- Social and student engagement.
- Faculty support and student support.
- Evaluation and assessment.

A program can be rated as deficient, developing, accomplished, or exemplary on each criteria. Similarly, iNACOL has developed the "National Standards for Quality Online Programs" for the K-12 level. These standards are grouped into the following four groups of standards:

- Institutional standards.
- Teaching and learning standards.
- Support standards.
- Evaluation standards.

Each of these four groups have a total of 19 standards in all.

Regardless of the set of criteria a program uses, standards such as these can be used in formative and summative ways to evaluate an online program's effectiveness. As the online marketplace continues to grow and competition increases, as well as a need for accountability continues, it will be imperative for online educators to find ways to formatively and summatively evaluate their online programs to ensure they remain appealing, effective, and efficient.

Conclusion

Even though the first online course was offered over 30 years ago, online education is still relatively new. As such, online educators continue to experiment with ways to design, develop, and offer high-quality instruction. Formative and summative types of evaluation are conducted by online educators to assess and improve online courses, online instruction, and online programs.

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30
TEACHING ONLINE
Where? What? Who? When? Why? How?

Kay Shattuck

A lot has changed about teaching online since the 2003 edition of this *Handbook*. At that time, Wolcott offered a review of the research literature on faculty participation in online distance education. Four years later, that review was updated by Wolcott and Shattuck (2007), and yet again by Shattuck in 2013. Updating the chapter for this fourth edition of the *Handbook* gave pause to where,what,who, when, why, and how teaching online was being captured in the research literature and the vetted professional literature. Two observations were made during this recent review of faculty participation in online learning:

- Mainstreaming (where and what) of online learning was a working assumption in the literature on the topic and embedded in discussion of faculty participation in online teaching. This becomes the context for an understanding teaching online.
- Motivations and satisfaction of teaching online were often discussed regarding career types and characteristics (who and when) of online instructors and increasingly understood from the perspective of those who teach online, those who do not teach online, and administrators. Motivation was frequently associated with recruitment (why) to teach online, as well as retention to continue to do so. In the most recent review of the literature, motivation was increasingly correlated with teachers' values and attitudes about pedagogy. Professional development, especially moving training into application and practice (how) was a theme in online faculty participation literature as a solution to better recruitment and retention of needed online instructors. Professional development was also discussed as a baseline activity for networking and motivation within a community of practice.

In this chapter, findings from the previous iterations of this chapter, along with results from the latest (2014–2017) literature review, will be presented and discussed. Recommendations will be provided for framing the research agenda regarding teaching online within U.S. higher education institutions.

Mainstreaming: The Changing Context of Teaching Online

Mainstreaming of online education in higher education was a working assumption in much of the recent research literature on the topic and was often embedded in discussions of faculty participation in online teaching. The mainstreaming literature reviewed fell into two categories: (a) the increasing

need of online instructors brought on by student demand; and (b) perceptions of online education. It is the wheres and whats encompassing online education—the context in which instructors are called upon to teach in today's higher education.

As early as 2004, Allen and Seaman declared that online education had entered the educational mainstream and was a viable option in helping institutions meet demands for more flexible educational opportunities. Recently, Garrett and Legon (2017) declared that "online learning is mainstream" (Slide 3) when summarizing preliminary results of a survey of chief online education officers about the importance of online education. Sally Johnstone, president of the National Center for Higher Education Management Systems, (2017) stated that institutions now look for online teaching experience when hiring faculty.

An accurate number of online enrollments and courses, and thus demand for online instructors, was a topic of discussion in the literature. Poulin and Straut (2016) concluded that more than 6 million students are getting their education by *taking all* online courses, and although overall enrollments in higher education have fallen, Allen and Seaman (2017) reported that 28% of all students were *taking at least one* online distance education course. These reports noted an uneven growth in online education across providers of higher education with a shift from for-profit institutions to non-profit colleges and universities.

Despite the demand and growth, perceptions of course quality by faculty and administrators are low. Allen and Seaman noted that in their 2005 report, and little seems to have changed in overall faculty impressions of online education. In 2016, when Jaschik and Lederman surveyed faculty on their attitudes on technology in education, 52–60% of the respondents reported that they thought online learner outcomes were dismal, and significantly, survey respondents reporting that academic technology was used "to satisfy accreditors and politicians—not to increase degree completion rates" (Straumsheim, 2016, para. 33–35). Yet, more faculty are teaching online. The proportion of respondents who said they had taught an online course continued to rise from 32% in 2015 to 39% in 2016.

Surveys in the professional literature often explore faculty acceptance of technology as a surrogate for online education and relate that to acceptance of online education. For example, Stewart, Bachman, and Johnson (2010) looked at the relationship between technology acceptance and intentions to teach online. In 2014, Dahlstrom and Brooks explored faculty perceptions of information and educational technology to discover that: (a) evidence of benefit to students; (b) course release time; and (c) confidence in the technology were the primary motivators to use educational technology. AlShahrani (2014) found that perceived high self-efficacy by online faculty in the use of technology for delivery of materials online mitigated any culturally influenced aspects associated with teaching online. In a survey completed by Babson Research Group and funded by the Gates Foundation (Lammers, Grant, Michel, & Seaman, 2017) looked at faculty adoption of digital learning and found that while "faculty are critical to success of digital learning, they are woefully undersupported" (p. 6).

Faculty attitudes, values, and perceptions of online distance education were evident when following the faculty participation research literature. A link between attitudes and participation in online learning was suggested by Ulmer, Watson, and Derby (2007) when they acknowledged that faculty with online distance education experience tended to view distance education as positive and enabling student learning. This restates the conclusions found by Lin (2002) that faculty were more likely to participate if they had a positive attitude toward distance education or had a positive distance education experience. A link between faculty values and attitudes toward online education was also noted by Mitchell and Geva-May (2009), who summarized that faculty attitudes serve as a deterrent to an administrative agenda of increasing online learning. Pointedly, they concluded that those interested in increasing faculty participation must refocus and connect with faculty interests and values rather than relying on technological and administrative perspectives. In preparing for a small study of full-time and adjunct faculty priorities for online instructional behavior, Maxson (2017) noted the

contention in the literature of reliance of part-time, adjunct instructors to carry out an institution's commitment to the delivery of online courses.

Motivation to Teach Online

The previous iteration of this chapter (Shattuck, 2013) provided a historical picture of faculty participation in online distance education in U.S. higher education—from the pre-2000s self-motivated and technology-enthusiastic faculty member "Lone Ranger" innovators and early champions of nontraditional students to the "early and late majorities" described by Stevenson (2007, pp. 141–142). Previously, much of the literature exploring online teaching came from the full-time, tenured perspective. The focus was on identifying motivations of those faculty who had moved from teaching in residential formats to offering their courses online. The recent research and professional literature done in preparation for updating this chapter included attention to who—career types (Taylor, 2017)—was teaching the online courses with U.S. institutions of higher education and their motivations.

The early literature on faculty participation focused on psychological motivations for teaching online, but by the end of the 2010s, the broader contextual sources of motivation were beginning to be emphasized. That emphasis continued to be explored in the literature. Institutional pressure for instructors to teach online courses such as faculty acceptance (Allen & Seaman, 2015; Shea, 2007), recruitment (Parthasarathy, 2009; Taylor, 2017), burnout (Bollinger & Wasilik, 2009; Portugal, 2013), and online faculty retention (Chapman, 2011; Windes & Lesht, 2014) were noted. Viewing faculty as one of the key shareholders in online learning has emerged in the literature (McGoldrick, Watts, & Economou, 2015), as well as promotion and tenure implication—long identified as disincentives for teaching online (Bussmann et al., 2017). The Bussmann study is an example of a trend in the literature to move beyond description of incentives and disincentives of teaching online to more emphasis on solutions for recruitment and retention of quality online instructors.

Intrinsic and Extrinsic Motivators

As in previous editions of this chapter, motivations are categorized as intrinsic—that is, engaging in the activity as personally satisfying and viewed as a reward in itself—or as extrinsic—that is, responding to external (contextual) stimuli with benefits received from a source other than the activity.

According to Shattuck (2013), the primary motivators for teaching online have been identified in the research as intrinsic. The broad categories of personal or socially derived satisfactions, personal or professional growth, personal challenge, altruism, and career enhancement, as well as wonder, convenience, professional growth and renewal, and esprit de corps (Cook, 2003; Wolcott & Betts, 1999) were presented.

Intrinsic motivators have been highlighted in the literature as being the strongest ones for faculty (Table 30.1).

Extrinsic motivators were situated in the research as being secondary to intrinsic (personal) motivations to teach online (Table 30.2). However, evidence was prevalent that there is a relationship between institutional-level enhancers and motivation. As presented in the previous edition of this chapter (Shattuck, 2013), faculty members, although intrinsically motivated, value and desire support services, including training opportunities in technology skills, design and instructional support, awareness of sound student support services, and esprit de corps as being part of team.

Green, Alejandro, and Brown (2009) explored participation factors that relate to retention of experienced online faculty by surveying full-time tenured, non-tenured, and tenure-track faculty, as well as part-time/adjunct faculty at 23 different universities (N = 135). Overall, respondents were motivated by "situational incentives," including flexibility and opportunities to use technology in

Table 30.1 Intrinsic motivators for teaching online, as identified in the pre-2014 literature

Personal or socially derived satisfactions: reaching new audiences, developing new ideas, using new technologies, engaging in intellectual challenge, increasing overall job satisfaction, gaining self-fulfillment, enjoying teaching, and undertaking professional challenge	Betts, 1998; Cook, 2003; Gupton, 2004; Hebert, 2003; McLawhon & Cutright, 2012; Miller & Husmann, 1999; O'Quinn, 2002; Ruckert, 2015; Schifter, 2002; Stewart et al., 2010; Ulmer et al., 2007
Personal or professional growth and renewal: engaging in self-improvement and promoting professional growth, providing innovative instruction, developing and applying new teaching techniques and skills, keeping abreast of new technologies, and fulfilling a personal desire to teach	Hatch, Bass, Iilyoshi, & Mace, 2004; Myers, Bennett, Brown, & Henderson, 2004; Rockwell, Schauer, Fritz, & Marx, 1999; Tastle, White, & Shackleton, 2005
Altruistic: making courses more accessible, helping students, creating opportunities to reach culturally diverse, more mature, and geographically dispersed students	Christo-Baker, 2004; Keen, 2001; Kirk & Shoemaker, 1999; Lin, 2002; Ndahi, 1999; Shea, 2007; Wilson, 2002

Table 30.2 Extrinsic motivators for teaching online, as identified in the pre-2016 literature

Value and desire support services: release from some portion of teaching assignment, lightened workload/increase in salary	Betts, 1998; Bollinger & Wasilik, 2009; Christo-Baker, 2004; Cook, 2003; Donovan, 2004; Gupton, 2004; Iken, 2000; Keen, 2001; Keeton, 2000; Martin, 2003; Nelson, 2003 ; O'Quinn & Corry, 2004; Ricci, 2002; Schifter, 2004; Shea, 2007; Simonson, Smaldino, Albright, & Zvacek, 2009
Value training opportunities in technology skills	Cahill, 2008; Iken, 2000; Keen, 2001; Lee, 2001; Martin, 2003; Tastle et al., 2005; Stewart et al., 2010
Value sound student support services	Allen & Seaman, 2008; Keen, 2001; Keeton, 2000; Shea, 2007
Value esprit de corps: online education as contributing to a positive image for their school and as allowing their school to meet changing market needs, loyalty to institution, faculty voice in the development of departmental and institutional policies and structures, being part of team/collaboration scholarship	Bernstein & Bass, 2005; Chapman, 2011; Miller & Husmann, 1999; Pathasarathy, 2009; Schopieray, 2006

addition to intrinsic rewards, such as intellectual challenge. A breakdown of faculty position indicated that tenured- and tenure-track faculty focused on the intrinsic rewards, while full-time, non-tenured and part-time/adjunct faculty found additional motivations in gaining teaching experience, including a "sense of loyalty to university" (p. 9). In a similar vein, Chapman (2011) found that while tenured, tenure-track, and "contingent" (that is, part-time) faculty were motivated by intrinsic factors, the opportunity for financial rewards was a top incentive—noting that this was inconsistent with previous research. Chapman suggested, "This may be because teaching DE courses is becoming more and more likely to be an expected part of a tenured/tenure-track faculty member's job" (para. 40).

Recently, Taylor (2017) applied Cherry's 2016 incentive theory of extrinsic and intrinsic motivators in the study of what incentives attract and retain part-time online teaching faculty in the

online delivery unit of a large public university. She found that while money was a motivator in the beginning teaching online, having flexibility was key in the decision to continue teaching part-time online. But it is not one size fits all. She suggested that administrators who want/need to retain adjunct faculty must be "wise to consider the unique needs and motivators of each adjunct faculty member when trying to retain these individuals" (pp. 103–104). Previously, Zone (2013) had found an institution benefits with fuller engagement of online adjunct faculty members teaching undergraduate courses when those faculty members feel appreciated by the institution.

Impact of Age, Gender, Technology Experience, and Faculty Rank on Motivation

Looking at career types and experience levels of who is teaching online has been an increasing theme in the literature. For example, Miller and Husmann (1999) pointed out that community college faculty saw distance teaching as part of their job, hence mitigating the influence of external pressures; however, Windes and Lesht more recently (2014) found that those with the most online teaching experience at a community college were less favorable to online learning than faculty teaching at four-year institutions, even if those faculty did not teach online. The authors did point out the limits of the small sample size on any generalization.

As early as 1999, Kirk and Shoemaker noted that younger online instructors were more motivated than older ones, and that instructors with prior experience teaching online were more motivated by the challenge of online teaching and applications of technology in teaching than were inexperienced instructors. A decade later, Mitchell and Geva-May (2009) found a relationship between academic subject disciplines and willingness to participate in online teaching, but no relationship between willingness to teach online and years of teaching experience. They found that faculty in academic subject discipline areas were less likely to accept online learning than those teaching career subjects. When studying faculty-perceived barriers to online education and with low response rate, Lloyd, Byrne, and McCoy (2012) found that the age of a faculty member, as well as faculty rank, impact perceived institutional barriers. As faculty rank rose, so did the perceptions of barriers to teaching online.

Gender factored into motivation for the faculty surveyed by Lin (2002), who concluded that female faculty members were much more likely to be motivated to teach distance education courses than were males. In 2007, Stevenson concluded that female faculty with less than ten years of higher education experience were most likely to participate in online instruction (as were faculty 46 years or older). Gupton (2004) also documented significant differences with respect to gender; however, Schifter (2002), Hebert (2003), and Cahill (2008) found no statistically significant relationship between the same variables and participation. Lloyd et al. (2012), in a study of 75 faculty at one state university, found that females rated barriers to online teaching, such as interpersonal, institutional policy, and training and technology barriers lower than did the male participants. Kennedy (2015) found that females reported formal and informal pedagogy-focused professional development more usefulness than did their male colleagues.

Motivational Considerations of Faculty Who Teach Online and Those Who Do Not

Motivations to teach online have been gathered from those who actually teach online, as well as administrators' assumptions about what motivates faculty to teach online. Stevenson (2007) found a positive correlation between the experience of being a student in an online course and willingness to teach online, and a negative correlation between years teaching in higher education and willingness to teach online. More recently, Betts and Heaston (2014) surveyed faculty and deans on 29 motivation factors and ranked them from the perspective of what motives and what would motivate to

teach online. Noticeable differences were revealed: those who have taught online were motived by the ability to use technology for improving learning opportunities and to provide greater flexibility for students. Those faculty members who had not taught online cited financial compensation, faculty workload, release time, and concern about course quality as the reasons for not doing so. Both experienced online faculty members and deans indicated they believed lack of adequate equipment to support and lack of support inhibited successful teaching online.

Overall, research findings indicate that faculty members who participate in online teaching were intrinsically motivated, and non-participators speculated that extrinsic motives, such as an increase in salary and monetary support in the form of overload pay or a stipend, would influence their decision to participate.

Differences Between Faculty Motivations and Administrators' Assumptions

Differences between faculty motives to participate and what administrators believed motivates or would motivate faculty to teach at a distance were revealed in the research as early as the seminal work of Betts (1998), and later supported by a number of studies through 2004 (Shattuck, 2013) and more recently by Allen and Seaman (2017), Betts (2014), Connelley (2013), Jaschik (2017), Jaschik and Lederman (2017), and Windes and Lesht (2014). Collectively, those studies found that faculty members cited intrinsic reasons for their participation in online distance teaching, while administrators speculated that faculty would participate for extrinsic reasons, such as additional money, credit toward tenure and promotion, and release time.

Demotivators to Faculty Participation

Barriers that discourage faculty participation in distance online education have been identified in the literature (Table 30.3), beginning with the seminal work of Dillon and Walsh (1992), and highlighted by Berge, Muilenburg, and Haneghan (2002), and reemphasized by Shea (2007). Four contextual barriers that were tied to extrinsic motivations are consistently cited as negatively influencing faculty decisions to participate in distance education: (a) lack of time; (b) lack of compensation; (c) lack of incentives and/or rewards; and (d) lack of policies and institutional support. Contextual barriers are

Table 30.3 Barriers to teaching online, as identified in the pre-2014 literature

Lack of quality or academic rigor	Curbelo-Ruiz, 2002; Lin, 2002; Nelson, 2003; Tastle et al., 2005
Lack of time	Berge, Muilenburg, & Haneghan, 2002; Cahill, 2008; Dillon &Walsh, 1992; Green et al., 2009; Halfhill, 1998; Liu, Kim, Bonk, & Magjuka, 2007; O'Quinn, 2002; Rockwell et al., 1999; Shea, 2007; Tastle et al., 2005; Wolcott & Betts, 1999; Zhen, Garthwait, & Pratt, 2008
Lack of compensation	Berge et al., 2002; Cahill, 2008; Curbelo-Ruiz, 2002; Nelson, 2003; Dillon & Walsh, 1992; French, 2001; Liu et al., 2007; O'Quinn, 2002; Shea, 2007
Lack of incentives and/or rewards	Berge et al., 2002; Cahill, 2008; Dillon & Walsh, 1992; Hagovsky, 2002; Maguire, 2009; Shea, 2007; Whicker, 2004
Lack of policies and institutional support	Berge et al., 2002; Curbelo-Ruiz, 2002; Dillon & Walsh, 1992; Lin, 2002; Porter, 2003; Schifter, 2004; Shea, 2007; Simonson et al., 2009; Sumrall, 2002; Thompson, 2013; Zirkle, 2004
Perceived lack of student interaction	Lin, 2002; Liu et al., 2007; Nelson, 2003

those deterrents associated with the institutional setting and typically outside of the control of the individual that can impact the motivations of the individual faculty member.

In a noted shift from assessing demotivators as explanations of why online teaching is not working, Portugal (2013) and Mansbach (2015) looked at the lived positive and negative experience of faculty members who teach online to identify burnout and stressors to identify strategies administration and leaders within institutions can address the stressors. The researchers noted the need to identify and recognize why some faculty members will likely feel more comfortable than others when teaching students online. These studies, along with Zhen et al. (2008), introduced the idea of exploring teaching values and attitudes that are positively and negatively associated with teaching online.

The Impact of Faculty Attitudes, Values, and Perceptions

Exploring and correlating faculty attitudes and values to perceptions of online education were sprinkled throughout the literature. Zhen et al. (2008) found that decisions to participate in online teaching were "strongly based on the key variable of faculty general philosophical views and faculty-belief of efficacy" (para. 35). If faculty members do not see personal intrinsic value—for example, if they do not perceive their pedagogical values as being accommodated and encouraged when teaching online—they will likely be more discouraged and might focus on often cited extrinsic demotivators as reasons why they do not wish to teach online.

More recently, McGoldrick et al. (2015), in a study supported by The Gates Foundation, followed the theme of attitudes and values of faculty perceptions of education, in general, and their motivations to improve their own teaching. As result of surveying 3,971 postsecondary faculty in the United States, three different groups of faculty were identified:

- **The champions:** made up of *teachers* and *executors* who are "optimistic about the benefits of online learning and open to digital tools" (p. 40). They practice student-focused pedagogy and are connected and networking with their colleagues and institution.
- **The prospectives:** made up of *the willing* who are in tune with students, are using digital tools, and are willing to explore topics on pedagogy and improving teaching. The *disconnected skeptic* made up the largest group within the study (26%) and includes teachers with little interaction with students and who see no benefit to exploring pedagogy as "they do not believe they will see any benefits from changing methods or techniques" (p. 41).
- **The opponents:** made up of *principled opponents* who consider themselves hardworking faculty, yet feel disenfranchised from their institution and are uninterested in engaging in any discussion of pedagogy and increasing digital tools in their teaching. The *research-minded*, which made up the smallest segment of the breakdown, is the least focused on students and skeptics of new pedagogies, and likely do not use digital tools.

Faculty attitudes, interactions, and behaviors were composed of (a) disposition toward students and pedagogy; (b) faculty-student interactions; (c) institutional factors; (d) personal influencers and networks; (e) specific innovations and techniques; and (f) faculty demographics, context, and trends. The authors argued that rather than assuming experience or rank provides an accurate picture of "disposition toward students, perceived leadership and institutional support, and their degree of connectedness with teaching . . . a wholly new lens is needed" (p. 5) for exploring faculty attitudes toward improving pedagogy. They projected that over 40% of faculty are either now or willing to adopt "techniques, tools, and behaviors which will benefit students" (p. 5), and that willingness is more reflective on their pedagogical perspective than teaching experience or faculty rank. Understanding who, what, why, and when online teaching occurs is more complex that exploring how faculty are transitioning from traditional classroom to online (Suter, 2002.

Role of Faculty Development

Shea (2007) related professional benefits to faculty members participating in online teaching by highlighting the call for "quality" brought to online learning; that is, a "greater necessity and opportunity for more systematic design of online instruction and a corollary positive impact on student learning and on classroom teaching" (p. 75). McQuiggan (2007) looked at the role of faculty development had on online teaching's potential to question teaching beliefs and assumptions. She concluded that if faculty development is designed to promote questioning of beliefs and assumptions, it has the potential to cultivate a reflective practice among higher education faculty members. She suggested that could lead to new possibilities for teaching and learning online, as well as face-to-face formats. Cobb's (2014) dissertation, "Learning to Teach Online: A Study of Faculty's Lived Experiences in Transformative Professional Development" raised the challenges of transferring training experiences into application during delivery of a real online course. Moving professed beliefs expressed during training into action can be a challenge. For example, Kamenetskiy (2015) and Kennedy (2015 explored engagement and satisfaction during online teaching professional development sessions, but not in follow-up as to if or how enthusiasm for carrying out any changes in their own online courses resulted in such changes.[1] However, Kearns (2015) found that online teaching faculty reflected on their practice, added structure, promoted more active learning, and encouraged peer interaction, thereby "a shift in focus from teaching to learning" (p. 3)—even in their face-to-face courses—as result of professional development and the experience of teaching online.

Taking this to the next step, Kearns and Mancilla (2017) explored the impact of participation in a Quality Matters professional development workshop[2] in which participants were exposed to standards for assessing the quality of the design of an online course. The aim of the workshops was an introduction to quality standards to be used in a peer review of colleagues' online courses, not necessarily to improving an instructor's own course/s. Nevertheless, it was discovered that 88.5% (N = 1,900) had made changes to their own online and blended courses, while 85% (N = 1,836) had made improvements to their own traditional classroom courses.

Value in a Community of Practice

Collaborative opportunities for new forms of scholarship on teaching, had been suggested by Boyer (1990) and by Bernstein and Bass (2005). Examples include, "analyzing student learning for the purpose of improving teaching and learning" (Bernstein & Bass, 2005, p. 2), applying "new [online] methods for documenting and exchanging the intellectual work of teaching" (Hatch et al., 2004, p. 5), using research and practice to guide peer review of online course for improved student learning (Shattuck, 2015); and encouraging faculty "to enhance practice and contribute to the teaching profession through significant practice-based research" (Sperling, 2003, p. 593). There is a whole body of literature on the Scholarship of Teaching and Learning (SOTL)[3] which was not reviewed for this chapter, yet the faculty collaboration dimension of SOTL can be framed in a Community of Practice (CoP)[4] framework.

Participating in peer reviews of online courses is an example of CoP in which colleagues share experiences toward solutions of shared interest (Wenger, 1998, 2006). It can be an opportunity for professional growth, while also providing both new and veteran online instructors, with motivation to improving their own course based on collegial exchange and recommendation (Linton, 2014). Poole and Shattuck (2016) identified "idea shopping" and doing a "parallel review" as a side benefit to members of the online faculty participation in an official Quality Matters peer review teams.[5] Seventy-eight percent of 4,566 self-reports indicated faculty peer reviewers had or intended to make changes in their own online courses, and 63% reported they had or intended to make changes in their own face-to-face courses. The value of networking as a way of faculty-to-faculty exchange in

sharing ways to improve quality of online courses is an ongoing exploration by a team at Northern Illinois University (Cowan et al., 2017). They used social network analysis in following the dissemination of Quality Matters principles within the university.

Discussion and Recommendations

Mainstreaming of online distance education provides the context for understanding participation of faculty and raises the questions of who, why, what, where, when, and how teaching is occurring online in higher education. Much of the research literature reviewed for previous iterations of this chapter had narrowly focused on the challenges of getting tenured and tenure-track faculty members to add online delivery to their course loads. An argument could be made that research approach only furthered the dismissive stance that online distance education was illegitimate. While there is still concern about the quality of online learning from many faculty, the participation literature provides some evidence that institutions are no longer just hoping and waiting for tenured, full-time faculty to "buy into" online learning. The demand for online instructors is changing the attention of both researchers and administrators. In the most recent review of the research, teaching online was often presented as a requirement—or soon to be one–for teaching in higher education, one that is often tied with calls for better understanding of the multi-dimensions of those teaching online and what motivates them. What is most evident in the recent review of the faculty participation literature is a redirection to address what is known about motivations and satisfaction from the faculty perspective (Wessel, 2016).

Over the past few years, a shift in understanding what motivates an educator to teach online can be seen in the literature. The recent studies on motivations have a common theme of calls for administrators to begin to identify solutions for the documented challenges of teaching online, rather than simply labeling them demotivators. The emphasis is shifting to getting a clearer pictures of career types actually teaching online, such as those identified by Taylor (2017) (graduate students, aspiring academics, freelancers, practitioner faculty, and loaners) for a better understand of motivational factors for teaching online, as well as exploring the impact of teaching philosophy on willingness to teach in active, learner-focused online courses.

A call for increased professional development is evident in the most recent literature, but importantly, not simply a call for more offerings. Applying CoP to extend professional development can be seen as a useful framework to engage/apply skills and strategies presented in professional development courses and trainings. A maturing approach pushes for a clearer understanding of following and promoting the transfer of training into practice, as well as networking to promote dissemination of active forms of pedagogy into the culture of a faculty, department, and institution.

There were a few recent studies that expanded attention to the relationship of teachers' pedagogical attitudes and values to motivations to teach online. For example, although McGoldrick et al. (2015) took a broader approach by highlighting the importance of a faculty member's approach to student engagement regardless of teaching situation, their work can easily be translated into impacting motivations to teach online. The researchers identified types of faculty orientations toward students, "connectedness with teaching" (p. 5), and perceptions of collegial relationships within the institution. The study provides a helpful approach to understanding why a simple use of professional development to motivate for teaching online is not enough. The approached employed by McGoldrick et al. (2015) informs understanding of motivational factors, and importantly, in the challenge of relying solely on professional development courses and training to motivate fruitful discussion among some faculty about improving teaching and learning. In a similar vein, Sawers, Wicks, Mvududu, Seeley, and Copeland (2016) explored "What Drives Student Engagement: Is It Learning Space, Instructor Behavior, or Teaching Philosophy?" There is so much more to be learned and connected to teaching online than just listings of motivators and distractions.

While exploring the SOTL literature was not part of this review of the literature for this chapter, it can be projected that a matrix involving professional development (PD), CoP, and SOTL might be envisioned. PD is often associated with presentation and dissemination of pedagogically informed strategies and resources, CoP is often an outcome of PD and promotes peer discussion and dissemination of teaching and learning activities, and SOTL is associated with researching to improve education and might mesh with what McGoldrick et al. (2015) identified as "principled opponents" and "research-minded" faculty orientations. That matrix is for future development and discussion.

Research Needs

As early as 2000, Hagner noted that while lack of faculty rewards did not "impede 'early adopters' and 'second-wave' faculty from participating in innovative instruction, rewards are 'crucial' for 'third-wave' faculty members if positive growth" is to be sustained and if continual improvement of teaching for learning is valued. "Third-wave" faculty will stay involved when they see online education "as a way to advance their professional career" (p. 31). Cook and Ley (2004) agreed and noted that "newer research studies indicate a strong trend towards extrinsic motivators as being crucial to faculty decisions to participate (or not) in distance education" (p. 227). Stevenson (2007) called attention to the fact that although more faculty are teaching online than ever before, the need still outstrips the participation. The latest wave might be called a "pedagogical wave" as attention is being drawn to instructors' perspectives, values, and behaviors to student learning.

Some research areas emerge from the recent review of the faculty participation literature:

- Is teaching online an expectation of current full-time faculty? Is experience in online teaching an expectation when recruiting new full- and part-time faculty? If so, what are the policies and procedures in place to facilitate this/these expectation(s)?
- What efforts are in place to retain online full- and part-time instructors? How, when, and by whom are decisions made to retain an online instructor?
- Is networking within an institution effective for furthering pedagogical discussion among online faculty (full- and part-time)?
- What is the relationship between learner outcomes and online faculty attitudes, values, and perceptions related to teaching and learning?
- What are the determinants in implementation of effective online teaching strategies presented during professional development training? What, when, and how does training translate into online teaching attitudes and behaviors?
- How does a faculty member's perspective on pedagogy correlate to success in teaching online?

Notes

1. Winegar (2000) called attention early to the dilemma that exposure to quality standards, such as Chickering and Gamson (1987), even when enthusiastically received during training does not assure any change in teacher practice. Adair and Shattuck (2017) discuss the value in a quality assurance process to move best intent to implementation of quality standards.
2. www.qualitymatters.org/professional-development
3. For introduction, see https://josotl.indiana.edu/ and www.northeastern.edu/cpsfacultycentral/wp-content/uploads/2013/03/Defining-Scholarship-with-Boyers-Four-Areas-of-Scholarship-Explored-and-the-New-Digital-Scholarship-A-Faculty-Conversation.pdf
4. For introduction, see http://wenger-trayner.com/introduction-to-communities-of-practice/
5. See www.qualitymatters.org/reviews-certifications/course-design-reviews

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PART 4

Audiences and Providers

An Overview

William C. Diehl

In Part 4 of this edition of the handbook, authors report on distance education and related literature in various sectors and areas of the educational landscape, including community colleges, continuing professional education, the armed forces, for-profit and private, and the corporate sector. As Dr. Moore noted in his preface of this handbook, we have also included a few chapters that are descriptive in nature and international in focus. These chapters describe distance education providers and the audiences in Indonesia and to Latin America, and the military. Additionally, readers will find an important chapter on science education that builds upon its contents in this handbook's previous edition.

More than 10 million students attend community colleges in the United States, and many of these students are employed. In Chapter 31, Shanna Smith Jaggars provides an overview of the state of distance education in community colleges and reviews the literature. Additionally, the chapter returns our focus to the role that design and technology play in creating successful flexible programs that can serve students who are often the first in their families to attend college.

In Chapter 32 Scott Gibbons, Matthew Yauk, and Kay Seo point to the more complex development and quality of continuing professional development due to the rising use and popularity of social media/online collaborative tools (so-called Web 2.0). The authors present an overview of continuing professional education in the medical, nursing, teaching, federal aviation, law enforcement, engineering, financial, legal, social work, and trade industries—and round out their chapter with descriptions of pedagogical models and trends of their use in the various areas.

Distance education has been a critical component of education in the armed forces, especially since World War I. Peggy Kenyon and Timothy Flora's Chapter 33 includes historical background, current trends, and a look at the future. It should be noted that there is a dearth of academic research related to distance education in the military, and that there are many opportunities for interested researchers to pursue.

Dietmar Kennepohl addresses the challenges and promise of distance education in science and technology related disciplines (including health sciences and engineering). His chapter looks at science culture, the approach to learning science, the role and design types of teaching laboratories, and how advances in ICT technologies affect teaching and learning.

Chapter 35 covers private and for-profit educational institutions. Historically, these types of organizations have existed since the early days of correspondence education. Shari L. Jorissen contrasts private and for-profit with public institutions, looks at trends (e.g., technology, marketization, and globalization) and then focuses in on how these organizations are perceived, how they are

regulated and funded, and what issues pertain to accreditation. Saul Carliner looks in Chapter 36 at distance education and training in the corporate sector. The previous chapter on professional development focused on the use of social media, but this chapter provides more specific clarification of terminology, a look at the literature, and also a broader overview of instructional techniques, instructional design processes, and evaluation. Finally, Carliner provides readers with a list of relevant journals that publish research on distance education in the workplace.

Michael Barbour explores in Chapter 37 the main themes found in the current literature related to K-12 and distance education. Researchers and students will find that this chapter provides historical background, and then an overview of the research on support, design, administration, teacher roles, effectiveness, challenges, and more. A strength of this chapter is that it concludes with "takeaways" that can guide researchers interested in K-12—and also in other areas of the field of distance education.

In the final chapters of the handbook, readers will find descriptive surveys that look to Latin America and to Indonesia. Beatriz Fainholc's Chapter 38 leaves readers with a rich inventory of the growing number of organizations and educational institutions in Argentina, Mexico, Brazil, Colombia, Chile, Uruguay, Costa Rica, Peru, Ecuador, Bolivia, Venezuela, Cuba, Dominican Republic, Puerto Rico, Honduras, Guatemala, Panama, and others. Tian Belawati and Melinda dela Peña Bandalaria in Chapter 39 have contributed a survey of the state of distance education in Asia, with an emphasis on Indonesia and the Philippines. The scope of distance education that is providing lifelong learning opportunities in Latin America and Asia is remarkable, and readers will find that these final chapters provide abundant resources for discovery.

31

ONLINE LEARNING IN THE COMMUNITY COLLEGE CONTEXT

Shanna Smith Jaggars

Public community colleges educate more than 10 million students per year, comprising over 40% of postsecondary enrollments (NCES, 2014). As open-access institutions, community colleges strive to provide opportunities to a wide variety of students, many of whom cannot afford the cost or time required to attend traditional four-year colleges. Compared with public four-year institutions, community college students are more likely to be 25 or older, to attend school part-time, and to be employed full-time (Carnevale, Smith, Melton, & Price, 2015; U.S. Department of Education, 2015). They are also more likely to be low-income and the first in their family to attend college, and as such, may have a limited understanding of how to navigate the cultural and logistical barriers of higher education, including how to be successful in college-level coursework (Bailey & Jaggars, 2016; Berkner & Choy, 2008; Karp & Bork, 2014; Ma & Baum, 2016).

In order to serve their largely nontraditional student populations, community colleges have long been interested in distance education. They began to expand distance education options in the 1970s, moving beyond correspondence-by-mail courses to telecourses and live interactive television, and in the 1990s, to online coursework (Mullins, 2003). Given that approximately four-fifths of community college students are employed, and work an average of 32 hours per week, community colleges' online offerings have been almost exclusively asynchronous (Horn & Neville, 2006; Parsad & Lewis, 2008). Online courses not only created more scheduling flexibility for students, but also created curricular flexibility for small and rural community colleges. By sharing online courses with sister campuses, these colleges could provide courses that otherwise could not be offered (e.g., Austin, 2010; Johnson & Berge, 2012). As the 20th century gave way to the 21st century, online learning enrollments increased rapidly at community colleges, reaching a 22% growth rate in 2007–2008; however, this growth declined across subsequent years to reach a modest 5% growth rate in 2014–2015 (ITC, 2013, 2016).

This chapter reviews the literature on online learning in the community college setting, focusing on patterns of student online course-taking, student performance in online vs. face-to-face courses, and factors affecting online course performance.

Patterns of Online Course-Taking in the Community College

In the fall of 2012, approximately 10% of community college students were enrolled exclusively in distance education courses, while 17% took a mix of face-to-face and online courses, and the

remaining 73% were enrolled in a fully face-to-face curriculum (U.S. Department of Education, 2014). However, students' membership within these three categories is not static: many students enroll fully face-to-face during some semesters, and then take one, two, or all online courses during other semesters. Overall, nearly half of community college students take at least one online course across their first several years of enrollment, but most of these students take only one or two such courses (Jaggars & Xu, 2010; Xu & Jaggars, 2011a; Johnson & Mejia, 2014).

Among community college students, online courses are more popular among those who are balancing multiple life demands (e.g., are 25 or older, have dependents, or are employed full-time), but also among those who are more motivated, better academically prepared, and have greater financial and technological resources (Gross & Kleinman, 2013; Huntington-Klein, Cowan, & Goldhaber, 2016; Johnson & Mejia, 2014; Shea & Bidjerano, 2014; Wladis, Hachey, & Conway, 2015; Xu & Jaggars, 2013). These students seem to select online courses strategically: they may need the flexibility of an online course in order to fill out the semester's schedule, but they recognize that online courses can be more challenging, and thus they prefer to take only "easy" academic subjects online, while taking "difficult" or "important" subjects face-to-face (Johnson & Mejia, 2014; Jaggars, 2014; Schulz & Ketcham, 2013). For example, in interviews conducted with students participating in online courses at two Virginia community colleges, 40% of students mentioned they would not take a math course online. As one student explained: "There's no way I could do algebra online. I'm barely making it through algebra right now, face-to-face, so I know I could not do it online" (Jaggars, 2014, p. 33).

Impacts of Online Course-Taking on Student Outcomes

The preponderance of research comparing college students' performance in online vs. face-to-face courses has focused on relatively well-prepared students attending fairly selective universities (Jaggars & Bailey, 2010), while only a handful have focused on community college students. Overall, studies conducted in the community college setting in the first decade of the 21st century indicated that students were more likely to withdraw from online courses mid-semester, but among those who completed the course, grades and other academic outcomes were fairly similar between online and face-to-face sections (Jaggars, 2013). However, these studies typically included only minimal controls for students' pre-existing characteristics, and in the case of studies comparing student grades between online and face-to-face courses, did not control for unequal withdrawal rates between the two modalities. More recent large-scale studies using rigorous methodologies have convincingly demonstrated that the typical community college student will perform more poorly in any given course if he or she chooses to take it online rather than face-to-face (Johnson & Mejia, 2014; Xu & Jaggars, 2011b; Xu & Jaggars, 2013). For example, Johnson & Mejia (2014) found that California community college students are 14 percentage points less likely to successfully complete a course if they choose to take it online rather than face-to-face.

This gap in performance is more pronounced for some types of students than others. For example, an older white woman may experience only a small decrement in course performance if she opts for the online modality, while a young black or Latino male is likely to perform much more poorly online than he would face to face (Johnson & Mejia, 2014; Kaupp, 2012; Xu & Jaggars, 2014). Thus, the performance gaps that some demographic groups experience in face-to-face classrooms become even wider in online courses.

More important than individual course performance, however, is the issue of student progression and completion. Prior to 2010, the question of whether online learning tends to support or hinder students' longer-term outcomes was almost entirely unstudied. Recently, four sets of well-controlled studies have tackled the issue, and have yielded mixed results. First, Jaggars and Xu conducted

statewide studies focused on Virginia's community colleges (Jaggars & Xu, 2010) and Washington's community and technical colleges (Xu & Jaggars, 2011a), tracking students who initially enrolled in 2004 across the next four years (in Virginia) or five years (in Washington). Using a wide array of controls, the authors found that students who took online coursework in early semesters were less likely to return to school in subsequent semesters. For example, among the Virginia 2004 cohort, those who took one or more online courses in the first fall semester were five percentage points less likely to return in the spring. In addition, students who took a higher proportion of credits online were less likely to attain a credential or to transfer to a four-year institution. For example, in the Virginia 2004 cohort, those who took only a few credits online had award/transfer rates that were six percentage points higher than those who took a substantial number of credits online.

Second, Johnson and Mejia (2014) conducted a statewide study of California community college students, tracking students who initially enrolled in 2006 across six years. Controlling for the number of college-level credits completed and a variety of other background variables, students who took more online courses were more likely to transfer or graduate from community college. Third, Shea and Bidjerano (2014) analyzed data from the Beginning Postsecondary Student Survey (BPS/04) focusing on approximately 4,600 first-time community college students who were surveyed in 2004, 2006, and 2009. The BPS does not provide full transcript data, and thus the authors focused on an item indicating whether the student had taken any online courses in their first year of college (2003–2004). Controlling for a wide array of student background characteristics, the authors found that graduation rates were five percentage points higher among students who had taken at least one online course in their first year. Finally, like Xu and Jaggars (2011a), Huntington-Klein et al. (2016) also focused on Washington state community and technical colleges, focusing on students who took any courses between fall 2008 and summer 2013. The researchers controlled not only for a rich array of student background characteristics, but also the student's cumulative GPA and credits accrued at the time of choosing to take a particular course online vs. face-to-face. In contrast to the first three sets of studies discussed earlier, the authors also used a sophisticated approach known as "instrumental variable analysis," which more effectively removes bias due to unmeasured variables. They found that students taking online courses are nearly seven percentage points less likely to take a follow-up course in the same department, and about two percentage points less likely to earn a certificate or associate degree.

What are we to make of this conflicting evidence? The mixed results may be due to different contexts (e.g., Virginia, Washington, California), which serve slightly different populations, have different policies, and may have differing levels of online course quality. Or the mixed results may be due to different methodologies, which control for unmeasured bias to a better or worse extent. But in general, it seems likely that online course-taking has different implications for different types of students. For example, for an older full-time working mom with a strong academic background, online options allow her to fit additional courses into her busy schedule, and may allow her to enroll in shared courses that her home college cannot afford to offer face to face. For her, these benefits outweigh the possibility of earning a slightly lower grade in any given online course, and her strategic online course selection is likely to accelerate her path to degree completion. In contrast, for a young first-generation male student who is struggling academically, taking an online course is a bad gamble. He is much less likely to succeed in the course, which in turn may increase his chances of exiting the major that requires the course, or dropping out of college altogether.

Designing Online Courses to Support Student Success

The body of research evidence discussed earlier suggests that the online course format is challenging for many community college students, yet it may be possible to design online courses that support

all students to succeed. Indeed, among the 112 California community colleges that Johnson and Mejia (2014) examined, three colleges had high online course success rates which rivaled or matched that of each college's face-to-face success rates. While thus far, there are no studies comparing the practices of community colleges with highly successful online course performance vs. those with poor performance, the literature does provide some suggestions. In particular, students report three primary barriers to success in online courses: technical issues, time management challenges, and a sense of isolation and having to "teach yourself."

Technical Difficulties

When researchers talk to students about their online course experience, technical problems (both unavoidable system-based problems and difficulties caused by the user's lack of familiarity with the system) surface as a frequent complaint (see Jaggars, 2013). These difficulties are exacerbated for students who are not able to access or afford reliable high-speed Internet at home, a problem which remains surprisingly prevalent among rural and low-income populations (e.g., see Lewis-Kraus, 2016; Mayfield-Johnson et al., 2014; U.S. Department of Commerce, 2013). Indeed, if faculty members are aware that their college's student population lacks high-speed Internet, they tend to avoid videos, simulations, or other engaging course materials which require long download times via dial-up connections (Hurt, 2008).

Regardless of the students' own technological infrastructure, the most dynamic and engaging online tools and technologies can also be the most prone to technical difficulties. Thus, if colleges wish to encourage adoption of these tools, they need to plan for the necessary technical support. For example, as part of an ongoing study, I recently visited a community college that taught several online courses using synchronous video technology, which allowed students to see and speak with the instructor and each other in real time.[1] Faculty and students spoke highly of the courses, but noted that first-time users typically experienced initial technical difficulties with the necessary software, video, and microphone. To facilitate new users' transition to the system, a technical support person virtually attended the first session of each online course and provided on-the-spot technical assistance to both the students and the instructor.

Unfortunately, the typical community college cannot afford to be so proactive with its technical assistance. While most colleges provide some type of technical support service for students, such services are not always open at the hours when students may be working online: one survey estimates that only 33% of two- and four-year institutions offer round-the-clock technical support (Green, 2010). Given that comprehensive 24/7 technical support is out of reach for most community colleges, some are exploring other strategies: screening, training, and early warning.

In terms of screening, some colleges require students to meet with an advisor or complete an online assessment before enrolling online (Xu & Jaggars, 2011a). Such assessments are meant to communicate the technological and academic expectations of online coursework, which may help students screen themselves out of online learning if they do not have the requisite technical skills or infrastructure. However, students may believe they have more technological proficiency than they actually do (Bork & Rucks-Ahidiana, 2013). As one online community college instructor put it:

> I think what the colleges are assuming is that everyone is computer literate now, and they are not. . . . In fact, I sometimes think [that younger students] are less literate than maybe their parents. They can text; they can do the "thumb thing," but as far as navigating on a computer, they are not comfortable.
>
> *(Bork & Rucks-Ahidiana, 2013, p. 10)*

To provide students with the opportunity to improve their technical skills prior to enrolling, these assessments tend to provide students with general advice, such as "Contact your college; it may offer courses to help you build your skills." More helpful, however, would be assessments that provide tailored training to prospective online students. For example, in response to a student's self-report of "very basic" technology skills, the system could recommend that the student enroll in a specific technology course or workshop available at the student's own campus in the upcoming semester (Xu & Jaggars, 2011a). Finally, to identify students who enroll online and then quickly flounder, some colleges have created "early warning" systems, which flag online students who do not log in, access course materials, or complete practice exercises within the first few days (Johnson, Mejia, & Cook, 2015). While preliminary studies suggest that such systems may be quite effective when properly implemented, they require a substantial outlay of up-front software costs, and also require colleges to systematically coordinate the efforts of faculty, counselors, or technological support staff in response to the warnings—a challenging proposition for many community colleges (Fletcher, Grant, Ramos, & Karp, 2016; Karp, Kalamkarian, Klempin, & Fletcher, 2016).

Time Management

Community college students feely admit that it is more difficult for them to stay on track in online courses (Capra, 2014; Fetzner, 2013; Jaggars, 2013; Mayfield-Johnson et al., 2014; Schulz & Ketcham, 2013). To be successful, online students must keep track of tasks and deadlines, and remain motivated to complete assignments on time. Online faculty tend to place these responsibilities wholly on the students' shoulders, and in many cases provide little guidance to students in terms of how to prioritize tasks, manage their time, and interpret assignment requirements (Bork & Rucks-Ahidiana, 2013). As one community college student complained:

> I understand it's distance learning, but here I am just studying away, and then I have to—to me, it's just too lenient. Like, he doesn't say "This is due, this is due, this is due" . . . It's very lenient, but he wants it all done by the end.
>
> *(Jaggars & Xu, 2016, p. 278)*

Community college students, many of whom are low-income and first in their family to attend college, may be uncertain as to how to structure their learning in the online context, and feel uncomfortable reaching out for help (e.g., Bork & Rucks-Ahidiana, 2013; Karp & Bork, 2014; Scott-Clayton, 2011). Thus, rather than expecting that community college students will instantly adapt to a new and perhaps confusing low-structure online environment, institutions and their instructors may need to explicitly help students learn how to succeed in an online course.

Indeed, while community college students acknowledge their own responsibilities in terms of staying motivated and on track, they also believe that they are more successful when online faculty support and facilitate these expectations—for example, by highlighting critical tasks and concepts, providing a calendar with a suggested sequence of tasks, posting announcements about upcoming deadlines, and making the course assignments engaging, relevant, and otherwise motivating (Bork & Rucks-Ahidiana, 2013; Jaggars & Xu, 2016). Highly experienced online community college faculty agree that students are more likely to stay on track when instructors make expectations clear, provide study tips for online learning, "chunk" online tasks and materials into smaller pieces, incentivize or mandate participation in online activities, and help keep students motivated through varied and relevant content (Meyer, 2014). Instructors may also find it useful to incorporate activities and processes that teach metacognition, system knowledge, and self-efficacy (Hannafin, Hill, Oliver, Glazer, & Sharma, 2003).

Isolation and Lack of Feedback

Qualitative studies suggest that many online community college courses feel isolating and even alienating (Bambara, Harbour, Davies, & Athey, 2009; Capra, 2014; Jaggars, 2013; Jaggars & Xu, 2016; Mayfield-Johnson et al., 2014). For example, a student in one study explained that:

> I don't know who these people are like in a regular class when you can see them face-to-face two times a week. . . . No one knows me and I don't know anyone else. For all I know I am in a class with a five-year-old or a 95-year old.
>
> *(Capra, 2014, p. 112)*

In another study, a student complained that some of his online instructors felt absent:

> Some teachers, they just don't care. Like you're on your own, like you're online, like it doesn't matter. You're getting a grade. You do my work online and call it a day.
>
> *(Jaggars & Xu, 2016, p. 278)*

For highly prepared, motivated, and confident students, this lack of interpersonal connection and support may not be particularly problematic. But most community college students are anxious about their academic abilities; and without a sense of connection, encouragement, and guidance from their instructors, these students are likely to engage in a range of counterproductive academic strategies (Barnett, 2011; Cox, 2009; Bork & Rucks-Ahidiana, 2013; Karp & Bork, 2014). For example, if a student is confused about an assignment's requirements, he may not reach out for clarification because he doesn't want to appear ignorant. If another student feels ashamed by the poor quality of her writing, she may procrastinate about tackling a writing assignment, or may complete the assignment but never turn it in. Accordingly, some empirical work suggests that in order to support diverse students' learning and achievement, online courses need to incorporate stronger interpersonal connections and instructor encouragement than most currently do (Jaggars & Xu, 2016).

How can instructors integrate such connection and guidance into their online courses? In Jaggars and Xu (2016), we rated online courses in terms of their degree of interpersonal interaction, and also interviewed students and faculty regarding their perceptions of those courses. In high-interaction courses, instructors tended to post to discussion boards frequently, invite student questions through a variety of modalities, respond to student queries quickly, solicit and incorporate student feedback, and provide clear expectations for student-to-student interaction—suggestions that are similar to those suggested by highly experienced online community college instructors (Meyer, 2014). In the high-interaction courses we studied, faculty also tended to incorporate technologies such as recorded video or audio narrations, which personalized the instructor by allowing students to see the instructor's image and hear the instructor's voice. Perhaps most importantly, high-interaction instructors in our study leveraged technology tools as a way to communicate that they cared about their students, as individual people and as learners (Jaggars & Xu, 2016).

In order to learn about and incorporate such techniques effectively, faculty need strong support from the institution, including ongoing professional development (Johnson et al., 2015). Many community colleges now require online faculty to participate in some type of training before teaching an online course; however, these opportunities often focus on technology rather than on pedagogy, and may not provide faculty with the degree of expert support they need to redesign on-ground curricula and pedagogical strategies for the online context (Cox, 2005; Instructional Technology Council, 2013; Millward, 2008; Pagliari, Batts, & McFadden, 2009).

Improving Online Course Outcomes At Scale

The specific suggestions included in the preceding sections may help ensure that students are properly prepared for online courses, make strong connections with faculty and other students, and are scaffolded with supports that help them further build the self-directed learning skills they need to succeed in online courses and in the broader academic and professional world. At most community colleges, however, there is no systematic effort to ensure that such suggestions are implemented in every online course. While many colleges encourage their online faculty to implement baseline quality standards such as those set forth by Quality Matters (2014), such implementation is typically voluntary (e.g., Fetzner, 2013; Maier, 2012). Excellent online courses are not created systematically and on a wide scale; instead, a small smattering of excellent examples arise from the individual talents and efforts of isolated instructors (Cox, 2005; Johnson et al., 2015).

In our book on community college redesign, we term institutions that operate on this model "cafeteria colleges": they offer a buffet of professional development and other resources to support high-quality course design and delivery, but faculty members are free to select only those offerings that appeal to them, or to select none at all (Bailey, Jaggars, & Jenkins, 2015). Moreover, in community colleges in which occasional teaching-related professional development is required, it tends to be ineffective because it is top-down in its approach, isolated from the classroom context, and does not provide sustaining structures over time (Barragan & Cormier, 2013; Bickerstaff & Edgecombe, 2012; Grubb & Gabriner, 2013; Murray, 2002). In contrast, a "guided pathways" college systematically supports high-quality teaching through four approaches: the inclusion of metacognitive or non-cognitive skills as learning outcomes, a team-based approach to course redesign, a "collaborative inquiry" approach to professional development, and the use of technology in the service of specific learning strategies.

First, given that many online learners struggle with motivation, self-directed learning, and time management, institutions can encourage instructors to define these skills as learning objectives, and consider how to build those learning outcomes as part of their course design. The teaching of these critical meta-cognitive and non-cognitive outcomes has become an important component of recent instructional reforms in the community college setting, particularly among reforms that focus on mathematics and other quantitative skills—an area in which students' motivation to learn is often notably lacking. For example, two prominent community college developmental math reform projects emphasize the teaching of "productive persistence," or the value and rewards of persisting through difficult problems (Silva & White, 2013; Rutschow & Diamond, 2015); a well-regarded statistics pathway for underprepared students encourages community college instructors to address not only their students' academic needs, but also their "affective needs" (Hern & Snell, 2013); and a highly effective math and English preparation program for remedial community college students is structured in ways that maximize students' interest in the material (Scrivener & Logue, 2016).

Second, under the team-based online course design model, individual faculty members are freed from the expectation that they must serve multiple roles as "subject matter expert, course designer, media developer, and—sometimes—programmer" (Johnson et al., 2015, p. 9). Instead, an instructional designer manages the course design process, a faculty member provides subject matter expertise, and other collaborators contribute their expertise in media design, instructional design, and software design and integration as necessary to support the course's learning objectives. Experts generally agree that the team-based model is much more likely to create consistently high-quality online courses compared with the individual model (Johnson et al., 2015). While the team-based model may be more expensive in the short-term, community colleges that offer consistently high-quality online courses may experience higher online enrollments, lower online course drop rates, and stronger online student term-to-term persistence, yielding improved revenue across the long term.

Third, instructor professional development is most effective when it is collaborative, contextualized in the challenges of instructors' own classes, structured to encourage inquiry and reflection, and ongoing across time (Bailey et al., 2015). Mentorship programs, which many online faculty believe are essential to developing a strong online teaching practice, can represent one example of this approach (Maier, 2012; Johnson et al., 2015). As another example, faculty teaching different sections of a key introductory course can identify a common instructional problem they all face, generate a potential solution, attempt the solution in their own course section, then reconvene to discuss the results and further revisions to their approach. Once faculty members begin to engage in this work, they find it intrinsically rewarding and worthwhile; however, the typical instructor is unlikely to volunteer for such work in the first place, unless the institution provides supporting structures and incentives to participate—for example, by building collaborative inquiry expectations into departmental service processes, or into evaluation and review processes (Bailey et al., 2015).

Fourth, novice online instructors can be dazzled by tools that look fun or fancy, such as games, puzzles, quizzes, or embedded audio and video. Such tools are often assumed to have a stand-alone intrinsic learning value; however, research indicates that they do not necessarily improve learning (U.S. Department of Education, 2010). This should not surprise us: any instructional technique may have positive or negative effects on student learning, depending on the instructor's implementation, the students' skills and background, and the course's content. By implementing team-based course design and ongoing collaborative inquiry, institutions will better position their faculty to select the most appropriate technology tools for their own unique course context and to leverage those tools effectively in the service of the course's learning objectives (Bailey et al., 2015).

Conclusion

Online learning affords flexibility and convenience to community colleges' nontraditional student populations, and also allows these institutions to be more flexible in their course offerings. Yet in order for online learning to meet its promise of improving postsecondary access and success among low-income and underprepared community college students, colleges need to create two types of infrastructures. First, colleges need to assess the technology challenges most likely to be faced by their own students, and create proactive strategies to mitigate those challenges—for example, by requiring certain levels of technology access and training prior to online course enrollment, or by embedding technical support into the online course ecology. Second, colleges need to set processes and policies in place such that, by default: online courses are created by a team of professionals, meta-cognitive and non-cognitive outcomes are considered as part of the course design, and faculty regularly gather to support one another in instructional inquiry, experimentation, and improvement. Some of these recommendations would radically reshape the way that institutions are organized, including the role of the faculty member. However, in order for colleges to meet increased expectations for student success, such changes may be necessary—not only in the online classroom, but also in the traditional face-to-face classroom.

Note

1. See http://ccrc.tc.columbia.edu/research-project/american-honors.html

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32

TRENDS AND DIRECTIONS IN CONTINUING PROFESSIONAL EDUCATION

Scott Gibbons, Matthew Yauk, and Kay K. Seo

The rapid spread of the Internet and creation of Web 2.0 tools has allowed connections across time and place, meaningful collaboration between peers of all experience levels, and the sharing of knowledge and resources that were previously not possible with traditional face-to-face modes of continuing professional education (CPE). User-to-user and user-to-site interactions pushed websites from static information-only pages to content development mechanisms built and curated by their audiences. This evolution of the Web supported not only active engagement in its users, but also provided broad access to learning opportunities through social media sites like YouTube, Facebook, Twitter, and Pinterest; massive open online courses (MOOCs) like Udacity, Coursera, and edX; or industry-specific communities of practice such as Edutopia for education (Prestridge, 2016; Song & Lee, 2014). It is in these dynamic spaces that participants are building their own learning paths in CPE, and it is this technological advancement that has promoted the widespread distribution of CPE in a distance education format. This chapter presents an overview of the technologies that shape and shift recent trends and directions in CPE and discusses how CPE has evolved in a variety of fields accordingly. It should be noted that there is varying terminology for "continuing professional education" in different fields, often used interchangeably, including "professional development" or simply "continuing education." Likewise, the terms "online" and "Web-based" were tantamount to "distance" in literature.

Advancement of Technology in Continuing Professional Education

Social Media

Whether through sharing ideas, communicating with peers, or seeking and evaluating knowledge, active participation is a tenet of both informal learning and social media (Song & Lee, 2014). Social media communities tend to be self-sustaining as the user dictates what they will do and how they will do it—much like how learners decide what to learn and how to approach it in informal settings (Jones & Dexter, 2014). The main reasons why learners engage in online communities are to find and exchange professional knowledge such as resources, ideas, opinions, suggestions, and information (Trust, 2016); and to follow and communicate with peers and leaders in the field. Twitter, for example, allows educators to build a personal learning network through self-created lists of innovators in the profession, other educators in similar roles, policymakers, and companies through which the user builds highly personalized community and news streams. They can also easily participate in

discussions using and following hashtags, such as the broad #edchat (all education), content-specific #sschat (social studies), or strategy-specific #PBLchat (project-based learning). In the case of Facebook, educators can form groups which may share ideas, files, links, and pictures, and possibly organize local meetups. Pinterest has become a frequent source of idea sharing and inspiration. YouTube has instructional how-to videos on technical and pedagogical knowledge, and is also one of the largest educational content repositories with the ability to be shared directly with learners. Networking and professional development are not the only activities occurring, however, as educators also utilize social media for community outreach, assignments, and assisting learners outside of instructional hours (Grote-Garcia & Vasinda, 2014).

Massive Open Online Courses

Massive open online courses (more commonly known simply as MOOCs) offer free (or low-cost) education online, usually through university-created courses and more recently through business-created content. MOOCs reached a pinnacle in public awareness in 2012 when three major platforms were launched: Coursera, Udacity, and edX (Waks, 2016; Kerrison, Son, Grainger, & Tutty, 2016). However, the concept of providing free online courses can be traced back to the OpenLearn initiative from The Open University in 1999, open courseware from Massachusetts Institute of Technology (MIT) in 2002, and Khan Academy in 2006, among others (Kerrison et al., 2016).

As advancing technology alters the requisite skills for on-the-job success, knowledge gained through a diploma becomes obsolete (Waks, 2016), and as higher demands for critical skills are placed on workers, increased CPE is needed (Olsson, 2016). In the past, workers were required to pay for more school or certificate programs in order to be retrained or stay competitive at their current job (Waks, 2016), but now they can complete free programs online to update their technical skills. Studies show that large portions of MOOC users are supporting their CPE needs, updating knowledge, improving their job performance, or finding new jobs (Kerrison et al., 2016; Chen et al., 2015). MOOC users have also started promoting their completion of MOOCs on resumes and professional networks such as LinkedIn (Kerrison et al., 2016), presumably as the awareness and acceptance of MOOCs increased in the workplace and companies began recognizing those external achievements (Pickard, 2016).

Microcredentials and Digital Badges

Most online CPE providers, including MOOC platforms, offer some sort of badge or certificate of completion of a course. This often carries a small price tag, but the credential can then be verified by a current or potential employer, and in some cases connect directly to one's online professional profiles. More recently, some of the top MOOC platforms began offering "super certificates" that recognized completion of a preset list of multiple courses (Waks, 2016), much like a college-awarded certificate or degree program. For Udacity, the first of the MOOCs to pivot toward a career-oriented course focus, their first "nanodegree" program was in programming and built in collaboration with AT&T (Waks, 2016). Coursera calls their super certificates "specializations," edX has the "MicroMaster's," and ALISON simply calls them "diplomas." Udacity has expanded its nanodegree offerings to include advanced-level tech subjects such as machine learning, virtual reality, and self-driving car engineering—all built by companies ready to recruit its graduates, and in some courses (and for an additional price), a job is guaranteed (Willis, Strunk, & Hardtner, 2016; Friedman, 2016). ALISON currently offers 92 wide-ranging "diploma" courses, including accounting, anatomy, carpentry and construction, languages, health and safety, law and legal skills, nursing, plumbing, psychology, statistics, and teaching and training.

The bundling or "stacking" of microcredentials earned through MOOCs allows a learner to build a personalized portfolio that may better suit both the learners in the emerging "gig economy"—staying in jobs a relatively short time to move onto the next opportunity—and the employers who are looking for adaptable, specialized workers (Waks, 2016). Willis et al. (2016) stated in *Educause* that, "College transcripts serve as independent, static artifacts, none of which, on a quick perusal, reveal an individual's skill set. Microcredentials, however, provide a promise of a layered or stackable credential that provides competency specificity" ("Shifting Powers" section, para. 3). One could even build their own custom degree made exclusively from MOOC courses (see Pickard's "The MOOC-Based MBA" from 2016), and if more widely accepted in the workplace, microcredentials would mimic traditional formal credentials and allow workers to engage in more meaningful CPE to advance their career (Willis et al., 2016).

Augmented and Virtual Reality

Augmented reality (AR) technology allows the supplementing of real-world places and situations with digital assets, such as text, animation, video, objects, or characters to help support investigation and exploration (Dede, 2009; Wu, Lee, Chang, & Liang, 2013). By providing a more immersive experience, virtual reality (VR) technology constructs a new or alternate world with which to explore and interact, often using more senses. Both technologies could provide similar benefits in CPE: enhancing psychomotor skills, role-playing situations, contextualizing learning, increasing engagement with material, providing authentic practice, and eliminating safety concerns and distance barriers, to name a few (Freina & Ott, 2015; Wu et al., 2013). Freina and Ott (2015) noted that VR is often used in vocational training and heavily in medical fields, including training in a virtual hospital, simulated dental procedures, simulated surgical education, and communication between staff. There will likely be an exponential rise in applications developed for AR and VR with the quick rise in popularity of commercially available headsets such as the Oculus Rift or Vive and a wide range of free game engines, like Unreal Engine and Unity 3D, to produce new content.

Continuing Medical Education

Despite differences in application, similar technologies are being leveraged across industries. The World Federation for Medical Education acknowledges that undergraduate and postgraduate medical education simply are not sufficient in keeping medical practitioners up to date and suitably competent (Battat et al., 2016; Ikenwilo & Skatun, 2014; Singh & Bajaj, 2015). The General Medical Council requires that doctors keep their medical knowledge up to date by regularly taking part in activities that "maintain and develop competence and performance" (Ikenwilo & Skatun, 2014, p. 195). CPE is necessary in the medical field to maintain a doctor's knowledge and skills in order to meet patient needs. Key factors for adequate and useful CPE in the medical field include flexibility, low cost, high quality, and independent learning (Abrahams, 2014; Battat et al., 2016; Boatin, Ngonzi, Bradford, Wylie, & Goodman, 2015; Farahmand et al., 2016; Ikenwilo & Skatun, 2014). New challenges in medicine are met with new technologies and new opportunities for distance education in CPE.

Some medical professionals prefer hands-on training to distance education because those practitioners often lack necessary computer skills or they think the program does not meet all of their needs. Pettersson and Olofsson (2015) state, "Distance teaching risks becoming an activity characterized by the transfer of content with little or no element of process-oriented activities such as dialogue, reflection, or co-construction of knowledge" (p. 368). A distance education program that lacks practical application of skills is likely to have a high dropout rate (de Castro E Lima Baesse, Grisolia, & de Oliveira, 2016), which is why a strong focus on transferring skills from the CPE program to practice is placed upon each program. Although there is resistance to online CPE in the medical

field, research by Farahmand et al. (2016) reveals that when comparing performance on the objective structured clinical examination (OSCE), distance learners outperform learners who participate in hands-on CPE. Farahmand cites similar results from a study done by Ali et al. regarding first-year family medicine residents and their performance in advanced trauma life support (ATLS). Despite positive outcomes in online CPE programs, one reason for pushback is that, "institutionally centered approaches to technology overlook the way that individuals grow and adapt to various environments through the flexible use of tools as they make their way through the world" (Johnson, Prescott, & Lyon, 2017, p. 20). Because some online CPE programs still lack appropriate skills transfer, some practitioners tend to avoid online CPE for professional development. The remainder of this section aims to review trends of successful online CPE programs in order to identify important elements that other programs can adapt and implement.

Growth in professionals across the globe forming partnerships has placed an increased demand on distance education for both skill development and improved practice. Through online CPE, partnerships tend to go both ways; doctors in developing countries have access to innovative techniques, and doctors in developed areas get exposure to ailments that primarily affect low-income countries (Boatin et al., 2015). Sharing resources and knowledge is one aspect prevalent in online CPE. The low cost and ease of use of many software programs is an appealing feature, especially for professionals in low-income areas (Abrahams, 2014). Practitioners are able to gain access to important skills and techniques via video conference and live lectures. Online CPE is not limited to practitioners in remote or low-income areas. All doctors must achieve a set number of continuing medical education credits per year to achieve licensure renewal (Ikenwilo & Skatun, 2014). Organizations are making it possible for CPE to fit the demanding schedule of medical professionals.

Improving personal performance is an important factor of distance education, but ease of use and easy access is a point of concern for organizations. Online CPE can enhance "the required basic skills and knowledge for performing the initial assessment and management in trauma patients" (Farahmand et al., 2016, p. 600). Different departments can easily work together to share knowledge about certain topics (Boatin et al., 2015). Many universities are making their CPE available on mobile devices to seamlessly integrate technologies with the lives of busy professionals (Johnson et al., 2017); other organizations are using social networking to improve access and ease of use (Maisonneuve, Chambe, Lorenzo, & Pelaccia, 2015). Videoconferencing and learning management systems (LMS) have been implemented in areas to allow access to live lectures and course materials (Boatin et al., 2015; Pettersson & Olofsson, 2015). Improved technology also helps to individualize CPE for professionals who prefer to self-pace their instruction.

Individualized learning is what drives online CPE. Farahmand et al. (2016) found that doctors preferred to learn at their own pace without the need to be physically present in a classroom (p. 600). Practitioners understand how they think and learn, so they learn best from an individualized CPE plan that allows them to experience personal transformation (Ruddy, Thomas-Hemak, & Meade, 2016). Singh and Bajaj (2015) maintain that individual flexibility is important to CPE and that online CPE is a solution to that type of professional growth. Though challenges exist with maintaining a balance between individual learning and group environments, having the option to learn at one's own pace or seek help or affirmation from others is an appealing component of distance education programs. Many CPE programs in other professions also emphasize individual learning with the option for professional guidance and group interactions.

Continuing Nursing Education

Nurses, more than other medical professionals, seek CPE that allows them to balance work, study, and family life (Carter, Beattie, Caswell, & Fitzgerald, 2015). Nursing not only requires practitioners to maintain growth in complex medical practices, but also with social skills for patient-nurse

interactions. CPE in nursing contains a wider breadth of skill building than physician CPE. An array of practical and social skills demands flexible forms of CPE, which new technologies within distance education provide.

Distance education has progressed in the nursing field because of advanced technologies and communication systems (Carter et al., 2015). Programs such as the Distant Faculty Model (Goodfellow, Zungolo, Lockhart, Turk, & Dean, 2014) combine skills like teaching, scholarship, and service combined with a faculty presence to help ensure online learning can be put into practice. According to Ross, Barr, and Stevens (2013), growing technological trends in online CPE for nursing include, "webinars (participants log into a 'live' online presentation), e-courses based on a Learning Management System (LMS) (e.g., 'Blackboard,' 'Moodle'), PowerPoint presentations, lectures, notes, podcasts [*sic*], workshop recordings and quizzes" (p. 4). Combining online CPE models (discussed later in this chapter) with new technology (discussed earlier in this chapter) allows nurses to improve their skills and knowledge bases, while implementing those skills in both online and physical environments.

Although many online CPE programs maintain a platform based on group instruction and interaction, individualized instruction tends to be a preferred method of receiving professional development for nurses. Learning teams have been found to be effective for both students and faculty (Nichols, Malone, & Esden, 2016), but not all participants want to be part of a team (Carter et al., 2015), which means that individualized instruction is a preferred method of CPE for nurses as well as other professions. Şenyuva and Taşocak (2014) found that in one study, 94.6% of nursing students preferred to study on their own, which leads to online CPEn programs implementing more elements of individualized CPE. To maintain participant engagement, despite learners being placed in groups of 35, Hodges and McGuinness (2014) found that students view online learning more favorably when they have virtual access to instructors and experts.

Unfortunately, there is a deficit in qualified instructors in online CPE for nursing. The lack of qualified faculty often results in larger numbers of individuals being grouped together for CPE (Goodfellow et al., 2014; Şenyuva & Taşocak, 2014). Colella and Beery (2014) identify that, "having a concrete experience adds to learning, which is why having the visual of an expert (faculty) performing skills as they should be done improves learning" (p. 437). There are, however, advantages to building teams in CPE. "Because of the complexities of nursing education, there is a particular need for interprofessional teamwork in the development and delivery of e-learning courses and programs" (Carter et al., 2015, p. 2). Individual learning combined with group environments and open access to experts are driving forces in distance learning among nurses in the medical field. online CPE programs for nurses are in need of evaluation to ensure that learners have access to necessary support.

As new challenges such as implementations and potential changes to healthcare policy occur, the demand for online CPE for nurses will continue to grow (Hodges & McGuinness, 2014; Şenyuva & Taşocak, 2014). Not only does CPE increase a nurse's critical thinking and knowledge base (Nichols et al., 2016), but it also equips nurses with necessary experience working with peers and patients in both practical and virtual worlds. Access to technology and qualified instructors is a growing problem in nursing CPE, and as the demand for CPE increases, so too will the demand for quality online CPE.

Continuing Education for Teachers

The focus of this section is on K-12 (kindergarten through twelfth grade) public education, as studies focused on that segment are more prevalent and there are clearer requirements for completing CPE, mandated at the state level. Studies about CPE for private school systems were less frequent and those organizations and staff represent a smaller portion of the occupation. Likewise, CPE in higher education is often focused on different outcomes such as research methods, has requirements that vary greatly by institution, is dependent on field of study, and is largely optional for the faculty member.

Continuing professional education in the field of K-12 education is often a requirement to update teaching and administrative licenses, and is commonly viewed as one of the main instruments to disseminate new information and educational policies, update educators with new research and pedagogy, and develop skills such as classroom management and effective instructional and assessment strategies. Professional development (PD) is used to advance all levels of education staff, including teachers in the classroom, school administrators such as principals and guidance counselors, and senior administrators like superintendents and curriculum directors (Engelbrecht & Ankiewicz, 2015). PD also serves as an accountability mechanism within the profession (Cervero & Daley, 2010). It helps teachers remain up-to-date with changes to state performance standards and federal initiatives and discover new teaching methods in their specific content area (i.e., social studies, science, math, career-tech, etc.) as school environments and student populations grow more diverse (Jones & Dexter, 2014). Professional development has shown to improve teaching strategies and classroom management skills, which in turn, improves student behavior and academic achievement (Gregory, Allen, Mikami, Hafen, & Pianta, 2014)—a common reason given for states to mandate completion of CPE and for individual school districts to be supportive of high-quality professional development efforts.

Obligatory CPE in professions has increased since 1970 as regulatory agencies looked to build accountability into practice (Cervero & Daley, 2010). There are no federally mandated requirements for completion of CPE hours for educators in the United States, but there have been a number of federal programs (such as No Child Left Behind, Race to the Top, Next Generation Science Standards, and Common Core State Standards) that incentivize the use of CPE through federal funding (Hoffman & Harris, n.d.). The majority of states in the United States require some amount of PD to successfully renew and maintain a teaching license past their initial certification out of college, but requirements vary by state (Hoffman & Harris, n.d.; Croley, 2015). For those states requiring it, the most common amount is six semester hours, or 180 contact hours, for a five-year license (Hoffman & Harris, n.d.). Approval of and implementation of CPE programs is generally left up to the individual school districts, which often form their own professional development committees to track and organize employee completion, promote outside CPE opportunities, plan in-house programs throughout the year, and assist in submitting relicensure (Hoffman & Harris, n.d.; Croley, 2015).

With a wide range of goals, providers, and delivery methods in CPE, a vast opportunity for targeted professional development is available to educators that fulfill various institutional and social agendas and meet individual needs and desires (Cervero & Daley, 2016). Local school districts, educational service centers or regional consortia, professional associations, higher education, non-profit organizations, and for-profit vendors are common providers of K-12 PD. Formal CPE for teachers is usually constructed as a one-time stand-alone program, such as one-day conferences or workshops (Cranton, 2016), and it often "focuses on an update of technical information so that the professional can return to their worksite with an increased understanding of new knowledge" (Cervero & Daley, 2010, p. 130). However, learning can take place in a range of contexts—formally structured by external provider, informally directed by the participant, or somewhere in between—any of which can have significant value to the learner (Beach, 2017).

Formal PD opportunities, such as face-to-face workshops, online courses in higher education, conferences, and seminars tend to focus on technical and instrumental knowledge, have clearly defined goals and expectations, are often highly structured and guided by an expert or instructor, and usually have a recognizable certificate of completion or credential (Beach, 2017; Cranton, 2016). Cranton (2016) stated that teachers often look to build specific technical skills through CPE, such as writing learning objectives, utilizing assessment data, or learning to use a new tool, which is why CPE providers advertise clear program outcomes and emphasize technical aspects of teaching. These formal experiences are sometimes less flexible with the learner—constrained by time, lacking ongoing support, and possibly not aligning with when instruction is needed most (Cranton, 2016; Jones & Dexter, 2014).

On the other end of the CPE spectrum, informal professional development is partially or fully constructed by the participant, can be open ended or ongoing, is flexible in time and place, and likely aligns with a teacher's needs and interests (Beach, 2017). Activities such as conversations with colleagues, involvement in education-oriented websites such as Edutopia.org, completing online training like that found on Lynda.com, completion of courses on a MOOC site, or participating in a focused social media network, group, or chat provides the participant with on-demand access to a self-directed pathway for learning and the ability to connect with others for support as needed (Beach, 2017; Prestridge, 2016; Macià & García, 2016). Referencing a number of studies, Trust (2016) stated that educators participate in these networks to "acquire and exchange professional knowledge, including teaching strategies, resources, ideas, opinions, suggestions, and information about the advances in the field of education" (p. 291). Moreover, the support and collective knowledge found through informal PD is not bound by physical building, organizational structure, preset timing, or participants as is found in more formal learning activities (Jones & Dexter, 2014).

An alternative to the formal one-size-fits-all prescribed model of teacher PD became imperative with the exponential rise of technology in the classroom, decreasing planning time for teachers, ever-changing policies and mandates, and having a wide range of knowledge, skills, subject areas, and experience in a single school building (Jones & Dexter, 2014; Engelbrecht & Ankiewicz, 2015). Many traditional teacher PD programs are disconnected from practical classroom application and not designed with adult learning principles in mind, leading to frequent dissatisfaction (Collins & Liang, 2015), whereas informal online options provide a motivating, self-directed experience and have increased with the emergence of social networking and Web 2.0 tools (Beach, 2017; Prestridge, 2016).

Collins and Liang (2015) found that 61% of teachers surveyed indicated that learning online better fit their schedule. Online professional development, whether formal or informal, removes many situational barriers that constrain traditional face-to-face PD, such as time, location, experience, cost, and current knowledge or skill level with a topic (Jones & Dexter, 2014; Beach, 2017; Booth & Kellogg, 2014). By increasing equitable access to like-minded peers and resources that aren't locally available, online CPE lends itself to greater learner control and therefore increases intrinsic motivation in the process (Booth & Kellogg, 2014; Jones & Dexter, 2014; Beach, 2017). Online communities also allow connections between pre-service teachers (student teachers) and in-service teachers, for an exchange of valuable information on both ends of the continuum of experience (Macià & García, 2016).

Studies have found that online PD community members are mainly motivated by desires to improve their teaching practice, and therefore student achievement and engagement in learning (Macià & García, 2016; Trust, 2016). Teachers also mention that online collaboration provides insights into their strengths and weaknesses as a professional (Acar & Yildiz, 2016), and that seeing actual lessons delivered in the classroom through other members' video posts allowed for meaningful reflection on how to effectively implement new instructional strategies or activities in their own classroom (Beach, 2017; Acar & Yildiz, 2016). Duncan-Howell (2010) found that 77% of teachers surveyed had been exposed to new ideas or resources through online communities that they later implemented in their classroom. The types of activities that educators engage with in an online CPE space include, but are not limited to: (a) finding and sharing knowledge, such as strategies, resources, ideas, opinions, suggestions; (b) sharing experiences and stories; (c) reflecting on personal practice; (d) asking or answering questions; (e) seeking emotional support and camaraderie; and (f) viewing information on new initiatives, trends, and policies (Trust, 2016; Macià & García, 2016; Booth & Kellogg, 2014; Duncan-Howell, 2010; Saifuddin & Strange, 2016). Always-present resources and activities in online communities allow for much greater time for reflection and contribution, which often results in more participation and generally a more meaningful experience, as discussions and content do not disappear and are readily available when needed most (Cranton, 2016).

Other Professions

Originating in the 1970s from a lack of accountability mechanisms, states began mandating participation in CPE as a requirement for relicensure and now, nearly every profession uses compulsory continuing education (Cervero & Daley, 2010). Referencing an AFL-CIO study from 2015, Cervero and Daley (2016) estimated that there are 81 million working professionals in the United States (51% of the total workforce). "These professionals provide healthcare services, educate children and adults, deliver rehabilitation services, supply legal support, and design the architectural infrastructure of our lives" (Cervero & Daley, 2016, p. 10). CPE is essential, especially for workers who perform highly skilled functions or professionals who are involved in public safety. Aviation and law enforcement personnel are two good examples to discuss here. It is critical for them to keep their knowledge and skills current because they have to deal with urgent—sometimes life-threatening—situations, and their job performance may affect others' safety and put themselves or others at risk. Continuing training and consistent education play an important role in assisting these professionals in adapting to any updates to their rules and regulations and competently serving in their fast-changing, labor-intensive work environments.

According to the Federal Aviation Administration, professional pilots are required to complete a proficiency check or simulator-based training, specifically on takeoffs and landings, before carrying passengers (Federal Aviation Administration 2016). CPE Requirements for law enforcement officers vary from state to state. For example, the Minnesota Board of Peace Officer Standards and Training specifies that peace officers must complete a minimum of 48 hours of continuing education within the three-year licensing period in order to maintain and renew their license (Minnesota Board of Peace Officer Standards and Training, n.d.). Missouri's new training standards taking effect in 2017 include 24 hours of annual continuing education training (Missouri Department of Public Safety, n.d.).

Aviation is especially notable in that it is one of the leading fields actively employing technology in CPE. Computer-based flight simulation dates back to the 1960s (Bonner, 2012), and has evolved to become an integral part of aviation. Not only does training in a flight simulator make a major contribution to improving safety, but it is also more effective than training in a real aircraft, reducing the training risk and achieving high levels of training transfer (Royal Aeronautical Society Flight Simulation Group, 2009). Simulation poses potential benefits in training law enforcement officers, as well. A variety of simulators have been used to train peace officers in their use of force, tactical judgment, firearms, and driving skills. The virtually simulated environment enhances the effects of training by replicating a realistic situation or creating an imaginary setting and allows the learner to effectively and efficiently develop fast-paced, high-intensity skills in lifelike contexts. Rapid advances in technology have dramatically transformed the way we train in aviation and law enforcement, and these fields have embraced technology as a powerful medium to deliver continuing education. The future will see consistent efforts to design and develop effective high tech-based CPE programs and a consequent increase in the use of online CPE, which will significantly contribute to the easy access to CPE.

Besides the aforementioned medical fields, nursing, education, aviation, and law enforcement, other professions requiring CPE include:

- Engineering, architecture.
- **Financial sector:** accountant, financial advisor, real estate agent, insurance agent, banking.
- **Legal sector:** attorney, judge, paralegal.
- **Social work:** social worker, child care provider, therapist.
- **Trade skills:** electrician, certain types of mechanic, HVAC technician, cosmetologist.

For the vast majority of professions, regulatory bodies (often a state department) set the CPE requirements and manage all licensing issues, while professional associations assist in distributing

information to their members and organize approved providers of CPE. Through the mid 2000s, a single instructor leading a large group of professionals on the most recent developments or trends was the predominant form of CPE (Cervero, 2000; Cervero & Daley, 2010), while recent advances in technology have allowed more flexibility in the process and autonomy for the learner.

Models and Forms of Continuing Professional Education

As technology advances and the needs of various professions change, so do the models and forms of CPE. Some models such as The Training Model (Kennedy, 2005), the Cascade Model (Gould, Papadopoulos, & Kelly, 2014), and the CoI model (Al-Balushi & Al-Abdali, 2015; Pellas & Boumpa, 2016) of CPE remain the same in terms of format, but the methods and delivery of those models change as new technologies become available. This section examines various models of CPE as they are used in the medical field and different levels of educator CPE, from K-12 to higher education.

Lack of resources continues to be a reason for the development of new models of CPE. The growth and reliability of webcam communication software has led to the development of online CPE programs for a variety of specialists in the medical field (Arora et al., 2016; Boatin et al., 2015). Project ECHO (The Extension for Community Healthcare Outcomes) is a model developed at the University of New Mexico Health Sciences Center to provide ongoing consultation to providers working with chronic diseases in under-served areas (Arora et al., 2016). Project ECHO presents practitioners with patient cases and examines best practices using a telementoring system. The topics and cases within the presentations are modified based on practitioner needs.

The Teleconference Program focuses on connecting rural populations of physicians, particularly obstetricians and gynecologists, with professional skill development in hospitals in the United States. The Teleconference Program was formed to partner a hospital in southwest Uganda with the Massachusetts General Hospital in Boston, USA. The program uses a combination of PowerPoint, Dropbox, Ventrilo, and Skype to connect the two groups of practitioners (Boatin et al., 2015). Working with professionals in remote locations is a form of CPE that is still in testing phases, but technology is making it possible to overcome the distance so that patients can receive care from top physicians who are remotely trained by expert practitioners. Researchers of the Teleconference Program report that the only issues they had were with Internet connectivity: "Six of thirty lectures had to be canceled due to failed connections or technical issues" (Boatin et al., 2015, p. 759).

Similar to the Teleconference Program, insofar as using scenarios meant to reflect actual events in order to improve problem-solving skills, the Compass program for nursing education is designed to improve a variety of aspects of nursing (Al-Balushi & Al-Abdali, 2015). Specifically, it helps nurses to better understand how to navigate through various problems of healthcare (Basol, Hilleren-Listerud, & Chmielewski, 2015). The Compass program is considered a mixed model because it utilizes PowerPoint to establish the complexity of nursing and videos based on a patient's story along with mentoring and hands-on learning. Many models in this section contain a combination of online technology mixed with onsite, hands-on practice. It appears that skill building through online CPE and then applying those skills in the physical workplace is a desired practice for many of the professions examined in this chapter (Ackland & Swinney, 2015; Al-Balushi & Al-Abdali, 2015; Cervero & Daley, 2010; Mast, Rahman, Schatzman, Bridges, & Horsley, 2015).

A continuing trend that appears in many forms of distance education in CPE is a combination of multiple technologies to achieve the desired skills development. The Queensland University of Technology (QUT) Distance Learning Program, "contain[s] a document with 'instructive text' supported by recommended readings and weblinks, vodcasts, reflection points, further readings and a glossary" (Lewis et al., 2016, p. 61). The QUT Distance Learning Program contains six modules that focus on three topics: learning and teaching, curriculum, and clinical teaching geared toward updating and improving the national nursing curriculum in Australia. Participants in the program view it

favorably and see direct applications to their professional practice, which is the main goal of all online CPE programs (Mast et al., 2015).

The Cascade Model focusing mostly on midwives was "designed to enhance learning opportunities for practitioners studying alone without immediate tutorial support in the spirit of traditional distance learning which does not allow for group discussion, sharing ideas or group support as would be available in the community of enquiry" (Gould et al., 2014, p. 617). The researchers argue that "CPD (continuing professional development) for qualified practitioners goes beyond the acquisition of skills and knowledge as its aims are to enhance competence and performance in practice, with the ultimate goal of improving patient care" (Gould et al., 2014, p. 614). The Cascade Model uses "a website and online learning materials to equip health visitors to deliver screening results during the usual course of their work" (Gould et al., 2014, p. 614). Several researchers found that to be successful, the model must consistently encourage the transfer of attained skills to actual practice (Ackland & Swinney, 2015; Al-Balushi & Al-Abdali, 2015; Cervero & Daley, 2010; Mast et al., 2015).

Though different skills are defined and enhanced, online CPE is also a preferred method of CPE within the field of education. Models are quite comparable in regards to structure, goals, and use of technology. Both medical professions and education professions use learning management systems (LMS) such as Blackboard, Canvas, and Moodle for hosting and delivering CPE content. In regards to using Blackboard, Johnson et al. (2017) state, "Learners in diverse professional settings articulate their own inquiries and experiences" (p. 23). The learner has more control over the form of skill development, which is a role reversal from previous models discussed in this section. The Moodle Professional Development Program on Teaching for Creativity uses an LMS to "nurtur[e] teachers' ability to design and implement classroom activities, techniques and methods that are intended to foster students' creativity" (Al-Balushi & Al-Abdali, 2015, p. 464). Al-Balushi and Al-Abdali (2015) cite Dougiamas et al. (2002, 2003) and Hellmig (2008) when explaining the benefits of a learning management system: "Research findings show that distance training through Moodle helps teachers to improve their knowledge and their reflective practices" (p. 464). Other online CPE models are dependent upon a user or users guiding the experience for the learners, but LMSs allow the learner to set the pace and even the direction of learning, placing responsibility on the learner.

The CoI (community of inquiry) model is used throughout various subject areas in K-12 education. Al-Balushi and Al-Abdali (2015) cite the framework developed by Garrison and Arbaugh (2007), explaining that some CoI models "utilize the cognitive presence, teaching presence, and social presence to design collaborative environments for practitioners" (Al-Balushi & Al-Abdali, 2015, p. 464). CoI frameworks have been around for decades, but secondary education is using the framework in new and advanced ways. Foreign language teachers are using the CoI model to focus on user interaction in 3D multi-user worlds, which can "positively influence the acquisition of user's motor and verbal skills, improving the retention and transfer of these skills beyond the initial learning situation, and second because they can enhance the educational activities, something that also increases their professionalism" (Pellas & Boumpa, 2016, p. 410). CoI models use programs such as Open Sim and Sloodle (Simulation Linked Object Oriented Dynamic Learning Environment) to replicate real-life classroom situations. Researchers found that the "advantages were mainly focused on visualization, interactivity, and collaboration which can enhance users' motivation and participation" (Pellas & Boumpa, 2016, p. 415).

In higher education, Actor-Network Theory (ANT), "elucidates the notion that actors—human and non-human—perform together to create an effect" (Ackland & Swinney, 2015, p. 12). ANT utilizes Google Hangout videocall functions, communities function for closed group commenting, photo and link sharing, and recorded and live chats (Johnson et al., 2017). The technologies allow the learner to make his or her learning public and share with a learning group, or the learning can be private and the learner can move through the course with little to no interaction with an instructor

or other users. The benefits to ANT are that the learner has more choice but still receives group guidance from other users.

The many models and forms of distance learning within CPE are growing each year, and as skill requirements change in various professions, so too will the models of CPE. Many models mix expert guidance with individual and group learning, but provide the option for the learner to move at his or her own pace, mostly for convenience. Many of the models also utilize a variety of technologies in order to enrich and enhance the learning experience for users. All models surveyed in this section take into consideration the importance of transferring learned skills directly into professional practice, without which models are rendered ineffective (Kennedy, Laurillard, Horan, & Charlton, 2015).

Promises and Issues With Distance Education Based Continuing Education

Online CPE contains many benefits to learners and professional organizations such as low cost, high quality, flexibility, and efficiency, but along with those advantages are hidden issues. Technical glitches, gaps between content and practice, and lack of technical skills on the part of the learner are some of the limitations in online CPE, but organizations have realized the restrictions of some online programs and have developed evaluation systems to identify and remedy those issues.

The costs of CPE often overshadow the value afforded by quality collaboration and skill building that CPE offers. Online CPE reduces cost in many areas, which is why both CPE companies and individual professionals are turning to online programs for their CPE needs. Poirier and Wilhelm (2015) state that pharmacists often travel to several expensive conferences every year in order to network and improve their knowledge base, but virtual conferences are much more cost-effective than attending a face-to-face conference, especially when including the cost of travel and accommodations. Not only is the low cost of online CPE beneficial to learners, but it is also beneficial for organizations developing online CPE trainings (Abrahams, 2014; Yates, 2014).

Deming, Goldin, Katz, and Yuchtman (2015) focus on the labor cost of CPE, and they claim that the reduced labor costs of online CPE makes online learning more cost effective for organizations. Because of advances in technology, more organizations are being drawn to online CPE as a replacement for face-to-face CPE. Abrahams (2014) states that one appealing feature of online CPE is, "The low cost and ease of use of new software and platforms that give lay instructors the tools to create and distribute quality educational material to target audiences" (p. 697). Though costs of online CPE are dropping, quality of online CPE is on the rise, in part because of evaluation systems that organizations are putting in place to ensure learners receive a high-quality experience.

Many online CPE programs are of high quality and are competitive with proven face-to-face CPE. Farahmand et al. (2016) reference studies done with medical interns where one group (control group) experiences traditional training while the experimental group experiences distance learning. Farahmand et al. (2016) found that the distance learning groups studying trauma scenarios consistently performed better than the control groups. Pellas and Boumpa (2016) argue that one reason why distance learners are able to perform well when compared to traditional learners is due to online tools such as Open Sim and Sloodle that provide learners with more interactive activities that correlate with skills necessary for professional practice. Some online CPE programs do not require live instructors and simply utilize recordings of quality instructors. One limitation of face-to-face CPE is the consistent lack of access to quality instructors, so a single recording of a quality instructor can reach an indefinite amount of learners (Abrahams, 2014).

Flexibility and the ability to self-pace are two of the most appealing features of online CPE (Erol, Upton, & Upton, 2016; Owen, 2015; Yates, 2014). In regards to online CPE in the nursing field, Carter et al. (2015) state, "The draw of such programs is their flexibility, which permits nurses to work, study, and manage family life at the same time" (p. 3). Individual learning has been found to be

a beneficial component to online CPE. Farahmand et al. (2016) state, "The students have the opportunity to learn without being physically present in classrooms and could study at their own pace, thus individualizing the learning process" (p. 600). Universities have even made online CPE available on mobile devices in order to coordinate with outside organizations and make CPE more convenient for learners (Johnson et al., 2017). Time is not only valuable for learners; it is also valuable for the organizations requiring employees to partake in CPE (Gould et al., 2014). Employees do not have to take time off work to attend training, so online CPE saves organizations the trouble of finding qualified replacements while their employees attend workshops and conferences. Yates (2014) has found that participants of online training enjoy the efficiency it offers with minimal disruptions.

Along with the many benefits of online CPE, there are limitations, which cause some resistance among learners. Some online CPE programs are still disconnected from enhancing applicable skills that can be immediately implemented into the daily tasks of learners (Battat et al., 2016; Hosey, Kalula, & Voss, 2016; Johnson et al., 2017; Pettersson & Olofsson, 2015). Researchers have found that when an online CPE program does not have clear skills crossover directly into the learner's job, dropout rates increase significantly (Carter et al., 2015; de Castro E Lima Baesse et al., 2016; Reichart, Elvidge, & Elvidge, 2015). Another reason for high dropout rates from online CPE programs is learner accountability. For some learners, online CPE can become challenging because the onus is placed directly on the learner.

Self-efficacy plays a large role in the success of online CPE, because many programs place the weight of learning on the learner. Learners can show a lack of interest or concern based on the amount of effort they put into posts and online conversations (Owen, 2015). Johnson et al. (2017) state, "Fundamentally, deep discussion, inquiry and learning about the complex environments each of us coordinates depends not on tools, but on interpersonal trust and shared expectations" (p. 26). Collaboration with other learners and with instructors is one way online CPE programs are combatting low self-efficacy and high learner dropout rates (Xia, 2015; Yates, 2014). In addition to learner motivation, lack of technology skills also plays a significant role in learner dropout rates (Colella & Beery, 2014; Erol et al., 2016; Hosey et al., 2016; Şenyuva & Taşocak, 2014; Yates, 2014). Systems are now being tested to analyze learner satisfaction and evaluate learner needs so that courses can cater to the unique requirements of each learner.

Several observations and recommendations to implement effective online CPE programs were discovered in reviewing literature on CPE for educators, such as:

- Material is (or can be) related to participant's interest and current situation (Beach, 2017) and is flexible and self-directed (Collins & Liang, 2015).
- Encourages application or "try-outs" to contextualize information and conversations and can be supported by a work-based learning community (Prestridge, 2016; Macià & García, 2016).
- Allows active sharing and communication (Barnett, Harwood, Keating, & Saam, 2002; Saifuddin & Strange, 2016).
- Program is led or moderated by a knowledgeable practitioner (Barnett et al., 2002; Saifuddin & Strange, 2016).
- Includes opportunity for practical, theoretical, and especially reflective experiences (Engelbrecht & Ankiewicz, 2015; Prestridge, 2016; Cranton, 2016).
- Incorporates research-based principles of adult learning, online learning, and content-specific learning (Collins & Liang, 2015).
- Builds a sense of community and trust, develops a clear purpose and collective identity (Macià & García, 2016).
- Provides: (a) structured activities with other members of the community; (b) tangible products for use in the workplace; (c) leadership opportunities to grow and assume ownership; and (d) tools and resource repositories with efficient tagging and search capability (Booth & Kellogg, 2014).

Engelbrecht and Ankiewicz (2015) summarized the correlation of elements of quality CPE for educators in stating that:

> It is necessary to link the practical, theoretical and reflective experience of teachers because it gives them the opportunity to make explicit connections between the professional development activities aimed at developing their school, discipline and pedagogical knowledge and making it a part of their personal subject construct.
>
> *(p. 280)*

These elements of effective online CPE for educators are worth mentioning here as there is application in all forms for CPE (formal, informal, distance, face-to-face) for all professions and builders of CPE would be wise to incorporate the above features.

Collins and Liang (2015) identified several key indicators that can evaluate high-quality online CPE for educators: "(1) content relevancy, (2) online features and delivery quality, (3) online participation and duration, (4) transformational learning for instructional practices, and (5) adult learning theory" (p. 21). Evaluation systems not only measure learner satisfaction, but the systems also analyze the tools online CPE programs are using and the methods of instructional delivery being implemented. Evaluation systems such as Course Resource Appraisal Model (CRAM) are being used to evaluate online CPE courses and programs (Kennedy et al., 2015). The evaluation tool defines course details and estimates teacher preparation needs. Through collaboration with wider education committees, Owen (2015) identified the need for virtual mentoring programs in online CPE. Hosey et al. (2016) evaluated online CPE for nurses and midwives and found that CPE programs needed to implement partners in the CPE organization process and make activities more relevant to practice, as well as establish better communication between learners and instructors. Online CPE programs are motivated to use evaluative software to identify deficiencies within the program so that they can better cater to learner needs.

Conclusion

Online CPE is a growing option for practitioners and professionals in a large variety of fields. Technological issues continue to arise as CPE organizers test new methods and incorporate new technologies into online CPE practices. Şenyuva & Taşocak (2014) note that "Distance education practices, which are limited but rapidly increasing, have become a requirement in educational activities relating to professions which face problems due to a lack of economic, political and physical resources, and inadequate numbers of instructors" (p. 2). Research has shown that online CPE is not only a viable option for learners, but that online CPE is quickly gaining prominence in the fields of education and medicine as studies show that learners are utilizing the ability to review material through online videos and even hone their skills through interactive activities. Online CPE is moving past simple Web pages with hyperlinks—and to ensure that online CPE develops to meet the complex needs of each learner, evaluation systems are being developed to ensure that each program undergoes scrutiny to meet high standards of knowledge and skill development.

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DISTANCE EDUCATION IN THE ARMED FORCES

Peggy L. Kenyon and Timothy Flora

The United States Armed Forces have been interested and active in the field of distance learning (DL), with the earliest examples seen in the publication of training materials for use in battlefield locations during World War I. In the ensuing years, military distance education has become a reliable method of bringing access to training and education for the men and women in uniformed and civilian service, anytime and anywhere it is needed. With the introduction of mobile learning, distributed learning has now pushed access to knowledge to the point of need.

Military Distance Learning

The Army Correspondence Course Program

Until 1978, Army distance learning consisted mainly of the distribution of training materials to the soldiers in the field or while on duty at home. Even though it did tremendous service to enhance learning, there was little student support and the program was not accredited. Around that same period, The Army Correspondence Course Program (ACCP) came to be managed by the Army Institute of Professional Development (AIPD) and received its first accreditation by the Distance Education Training Council. The AIPD was recognized as an institution that incorporated best business practices which offered student support and other services to assists students in achieving their educational goals.

This early, formal, and newly accredited program consisted of text-based instructional material used to train, assess, and award credit (Duncan, 2005). Each day, thousands of books bound in yellow jackets were mailed to students who completed the material and then returned specific items to be hand-scored. Despite the formal name of ACCP, to many soldiers, it was known simply as the "yellow books" and was an important tool in career progression. For soldiers, the points gained toward promotion, and the courses completed, became a part of their official military personnel file and served to highlight personal commitment to professional self-development.

The Army Correspondence Course Program was changed for the digital age around 1990, when an initiative was born to offer the program as Web-based content. As technology began to mature, and computers became prominent in the workplace as well as the soldier's home, the design of distance learning began to change. With a mission to establish "classrooms without walls," hundreds of hours of content were digitized for Web delivery (Duncan, 2005).

A second move to modernize the program occurred in 2007 to make the Web-based content more student-centered, engaging and interactive. This current movement makes the best use of guided simulations, gaming scenarios, and real-time feedback. This effort is still under way.

In 2012, the fully accredited Army Correspondence Course Program offered both individual and group study options and was open to reserve and active duty Army components as well as to Department of the Army civilians. At one time, the program had over 100,000 annual enrollments and continued to be a successful way to train the force (Duncan, 2005).

In 2015, the number of ACCP courses had reduced to less than 30 and the program had lost the support of many of the training proponents. In 2016, a directive had been sent out to those same proponents advising them of plans to retire the program that was once known as the "yellow jacketed books."

The United States Armed Forces Institute

The Air Force was an early adopter of distance learning. In 1942, the United States Armed Forces Institute (USAFI) was established in Madison, Wisconsin. It worked with the University of Wisconsin and 70 other academic institutions to provide educational opportunities for thousands of members of the armed services, a mission of special significance during World War II and the post-war period. This allowed coursework to be completed, through distance learning, during the service member's actual duty day.

The Air Force definition of distance learning is one of physical distance between learner and instructor following a structured curriculum. Distance learning provided a means to deliver instruction to learners around the world by using traditional written material and one-way technology such as television, audio, and film.

The Air Force Extension Course Institute

The Extension Course Institute (ECI) and the United States Armed Forces Institute (USAFI) used the same course delivery model around 1950. The Air Force ECI was established to provide correspondence courses to airmen and was the only Air Force correspondence school. Similar to the Army's ACCP, the ECI's original mission was to provide non-resident career development courses (CDCs) for both active duty and reserve Air Force personnel. These included formal upgrade training, supplemental training, and career-broadening courses. Career advancement in the Air Force required airmen to complete ECI courses and on-the-job training (OJT) performance to be eligible for promotion.

During the early years, thousands of copies of each course were printed and stored in a warehouse at Gunter AFB, Alabama. The batch printing process required estimates of how many copies would be required, in fervent hope that there wouldn't be major changes in content before new copies needed to be ordered. As might be expected, ECI was an expensive program. Waste was unavoidable because requirements for copies changed frequently. Changes in content often generated out-of-cycle reprint requirements with additional postage dramatically increasing the cost. By the 1980s, processes were improved to allow printing on demand which drastically reduced the amount of material to be stored. Out-of-cycle reprints were minimized and the currency of the content was improved. While waste was minimized, postage remained a major expense.

The Air Force continued upgrading capabilities well into the late 1990s by converting ECI courses to CD-ROM delivery. The use of CDs allowed the use of video clips, complex graphics, and audio to greatly enhance the user experience. An additional benefit was a huge reduction in postage charges. Also during the latter part of this decade, and realizing the commonplace nature of

the computer and its benefits to the student, the Air Force Distance Learning Office (AFDLO) was established. At AFDLO, with a small staff of only seven people, standards and policy were established for Air Force distance learning, and they began championing the much-needed funding to implement a program of this magnitude.

In February 2000, the Air Force Institute for Advanced Distributed Learning (AFIADL) was formed out of a merger of ECI, the Air Force Distance Learning Office and the Air Technology Network. AFIADL emerged as an all-encompassing agency that enabled the Air Force to provide learning anytime, anywhere, through enterprise delivery and student management systems. The AFIADL worked diligently to make the necessary upgrades that would continue to modernize the program.

Converting CD-ROM delivery to an online format was a modernization effort that was completed in 2011. The 254 courses that were previously offered via CD were given residence on Air University's Advanced Distributed Learning Services (ADLS) site. These courses are in a PDF (portable document format)file that allows users to highlight, take notes, and print selected portions of the lesson. Additionally, students may download the entire course to DVD or their personal computer, so they can have access while away from ".mil" domains. The obvious advantages to updating content, providing anytime/anywhere access for users, and cost savings in terms of postage make this format an advantage.

The Navy's Center for Personal and Professional Development

Just as the Army and Air Force evolved from paper-based correspondence courses over the past 40 years, the Navy followed suit. The same distribution, postage, and updating issues appeared over the years and dissipated as technologies enabled content to be distributed, at first via CD-ROM, and then eventually online.

In the late 1990s, the Navy also entered the arena of technology-enabled distance learning. This endeavor was intended to deliver quality education and training to the right people at the right time as part of their career-long training continuum. As a result, a network of automated electronic classrooms, video tele-training, and learning resource centers was used to carry out these tasks. There were five phases to the implementation of this plan: developing an enterprise strategic plan, refining that plan, designing and developing system architecture to support it, evaluation of the prototype, and launching those enhancements. The five-phase program was eventually fielded in May of 2001 with the use of ".com" and ".mil" websites. There were also plans to have classified information on its own protected site.

In the meantime, courses were converted to the new format. In the beginning, 50 Navy-specific courses were converted, as were 580 general business and management courses and 800 other technical courses. It was a herculean—therefore slow—process. Housing the courses on the Navy's learning management system was part of this process.

By the year 2000, and in response to the increasing need for sailors to have access to higher education in pursuit of their GED and/or college degree, the Navy College's Distance Learning Partner program was developed. Since its inception, partnerships with colleges and universities have added to the distance learning opportunities, with each degree making maximum use of professional military training and experience to fulfill degree requirements.

On May 30, 2008, the Navy entered into its current distributed learning program which focuses on increasing efficiencies. The Center for Personal and Professional Development serves as the central authority for Navy training for leadership, professional, and personal development, as well as training and support. It provides the tools, opportunities, and solutions to foster an environment for each student to maximize their potential. With effective technology-driven training delivery, this organization provides the competencies needed in support of mission readiness.

Distance Learning vs. *Distributed* Learning

In the late 1990s, the Department of Defense (DoD), acting on a White House initiative, launched the Advanced Distributed Learning (ADL) program. This program changed the emphasis of distance learning, where teachers were physically separated from the learner, to distributed learning, where separation might occur but face-to-face classroom presence, on a limited basis, could also be part of the paradigm (Fletcher, Tobias, & Wisher, 2007). It has been called one of the most significant events in the DoD's commitment to distance education (Duncan, 2005). The ADL vision was for human knowledge, stored as digital content, to be accessible to all and have the ability to be used in a variety of instructional settings. The change marked a difference in the way distance learning would be designed, developed, and packaged for delivery. It marked the shift away from paper-based and television, to emerging technologies, including the use of the Internet.

The Advanced Distributed Learning Initiative

The White House's initiative, during the late 1990s, prompted the ADL to develop standards for Web-based content. Even though the DoD took months to update guidance for course developers, the intent was to provide a way for developers to share content, methods, and code, while ensuring tax dollars were not wasted on duplicated efforts. The intended outcome was to enable, and then maximize, reuse of content. The DoD planned for online search routines to discover content. The DoD also enlisted the ADL to publish the requirements for accessibility, interoperability, durability, and, ultimately, reusability of Web-based content. To implement DoD guidance, the ADL initiative developed an idea called the Shareable Content Object Reference Model (SCORM). This model allowed execution of these search routines and also provided the accessibility, interoperability, durability, and reusability that was required. Unfortunately, implementation was not easy. Even though the concept called for content to be separated into small pieces—such as lessons, topics, or tasks—which would allow pieces to be reassembled into different ways, the files ended up being too large. Keeping content pieces small has proven to be more difficult to implement than was anticipated by the DoD.

The early concept of course design with SCORM was compared to Lego blocks. Each piece would represent a small, standalone, reusable piece of instructional content. These small, "tagged" pieces would populate a database available for discovery by all other military services and government agencies. This way, the items that would be needed could be retrieved and reused by any of these entities, therefore saving time and money. Although a promising concept, the large database of reusable chunks has yet to be realized. All branches of the military have active programs producing SCORM-compliant courses; however, each implements the standards in different ways. The Army chose a business model that did not define the size or level of content tagging. As a result, most developers opted to tag at the course level. That meant reusability was limited and unlikely to be used by other services, or government agencies, at the large, full-course level.

For DoD, the acceptance and use of SCORM continues to be at issue. Therefore, the promise of interoperability between delivery systems and the hope of reusability have not been fully realized. The granularity, or size of learning objects to be shared, is not adequately defined or standardized among organizations. The governance and location of repositories for these learning objects has not been fully addressed. Even more fundamental has been the question of whether or not all Web-based content needs to be SCORM compliant. These issues have prompted a review and revision of DoD guidance. As of 2016, the DoD is still working to publish updated guidance, which was last published in June 2006.

The Army Distributed Learning Program

Gen. Dennis Reimer, the former Chief of Staff of the Army (now retired), approved the concept plan for The Army Distributed Learning Program (TADLP) on April 19, 1996. His vision was to look

into the possibility that, in time, resident courses would consist of officer and non-commissioned officer professional education courses. All other courses, which included military occupational specialties, would be presented by a combination of resident training and distributed learning. This program provided the overarching long-range programming, planning, funding, and acquisition strategy needed for DL to become a pillar of Army training.

The Army Distributed Learning Program combines resources of the active Army and reserve component to deliver instruction to soldiers worldwide. It uses information technology to develop, implement, and evaluate instruction, enhancing and extending traditional methods of learning. TADLP is an integral component of the institutional, operation, and self-development training domains.

The Army Distributed Learning Program is comprised of Army-wide courseware development, the Army e-learning program, The Army Learning Management System (ALMS), and distributed learning classrooms (fixed and deployable). TADLP supports the DoD intent to deliver "learner-centric" training, when and where required, increasing and sustaining readiness throughout the active Army and reserve component.

The Army National Guard had its own distributed learning initiative supporting the four pillars of its system: courseware, technology, instructor training, and learner support services. Their approach to the development of courseware differed from the Army in that they believed development should be designed specifically for the delivery platform (Bond, Poker, & Pugh, 1999). Today, this focus has shifted, as technology has evolved and delivery platforms have changed, which now offer greater flexibility.

Advanced Distributed Learning Service

The Air Force Advanced Distributed Learning Service (ADLS) was established in February of 2000 by combining three distinct organizations: the Air Force Distance Learning Office (AFDLO), the Extension Course Institute (ECI), and the Air Technology Network Program Management Office (ATN PMO). It served to carry out the mission to provide voluntary non-resident courses for both active duty and reserve Air Force personnel and providing career-broadening advanced distributed learning courses to people throughout the DoD and civil service. Having a place to control these learning products became important as demand grew.

Computer-based training was a vast improvement over publishing textbooks and mailing them to students. As more courses were delivered via CD-ROM, certain issues began to arise. One of the major problems was in version control. Whenever an update was needed, a new CD-ROM was produced and distributed to organizations. This resulted in improper filing of the old, outdated versions, with the unintentional result of users sometimes being given the wrong copy. With the emergence of the Internet, the challenges associated with publishing and mailing items to students were resolved. Upgrades in versioning software helped students get the most current versions of the training they required. Costs were lowered, and centralization of material helped everyone gain access to material, and have the ability to update it, quickly and more easily than ever.

The Air Force migrated into the e-learning era using distributed learning funds generated by the Air Technology Network (ATN). In October of 2004, the Air Education and Training Command (AETC) initiated an effort to deliver and track its courses online using a learning management system (LMS). The projected population was 44,000 users. Consequently, demand wildly exceeded expectations. By the end of 2005, over 100,000 users were actively pursuing their training requirements using this system. This success was noted by Air Staff and in June 2006, the ADLS was selected by Air Force Manpower, Personnel and Services as the enterprise system to host all computer-based Air Force ancillary and readiness/deployment training. By October 2007, the number of ADLS user lept to 640,000—coincident with the release of three new mandatory training courses required for

all airmen to complete annually. Unfortunately, the huge number of users over-stressed the system, which was only designed to support approximately 145,000 users, causing the service to crash. With heroic measures, service was restored within three days. Service architecture limitations caused access times to be slow and interruptions were frequent for many months until the program management office was able to apply remedies. Ultimately, service was adequately restored and improved with the addition and architectural reconfiguration of servers.

The Air Force's Air Force ADLS currently delivers, tracks, and reports SCORM-based course content 24 hours a day, seven days a week. After establishing an account from a ".mil" environment, content is accessible anytime, anywhere. ADLS also has a unique feature (site partners), which allows organizations or agencies to manage their own courses and users, thus behaving as stand-alone learning management systems. When a user logs on to one of these sites, they are accessing courses unique to that particular site. Typically, they contain content relating to functional career areas. Currently, ADLS has 18 site partners.

Management of ADLS is centrally administered with decentralized execution. Configuration control of ADLS is done in conjunction with its partners. If a change is desired, a user or manager submits a system change request (SCR), which is recorded by the ADLS program management staff. The change requests are prioritized and presented at a quarterly configuration control board meeting. The partners review the list and the prioritization, recommending approval or disapproval. The SCR list is then given to ADLS programmers to develop and implement. Constant communication ensures SCRs are clearly defined and that the submitter knows the status.

ADLS currently has approximately 760,000 active users and hosts over 2,300 courses. Course completions average about 800,000 per month. The staff to support this mission consists of four permanent employees and varying numbers of augmentees manning the help desk from 0630–2000 Monday–Friday, and 0730–1630 on Saturday.

The ADLS excels at delivering asynchronous learning content, but does not provide significant synchronous or collaborative learning capabilities. This capability gap hindered wider adoption of ADL across the Air Force for many years. Data calls in Air Force formal training programs during 2008–2010 sought to identify in-residence courses which could be converted to strictly asynchronous delivery. The data calls found that while many courses could benefit from conversion to blended learning, few were valid candidates for 100% conversions to asynchronous. Because the ADLS did not provide the required capabilities, very few conversion were executed.

During 2015–2016, the Air Force ADL program secured a solution to fill the gaps in the capabilities that would allow the conversion of more in-residence training courses to ADL. The Enterprise Blended Learning Service (EBLS) was established as a supplement to ADLS capabilities, utilizing the Software as a Service (SaaS) approach for access to commercial products that added Web-based synchronous and collaborative learning capabilities to the Air Force e-learning portfolio. This addition of capabilities allowed functional communities across the Air Force to renew efforts to convert more courses to ADL delivery.

Programs and Initiatives

The Future of Print and the use of Electronic Publications

For the Air Force, print will continue to be used extensively. In spite of a DoD drive to convert as many courses as possible to online, the Air University maintains that it will not select media that are less than optimal to reach its many learning objectives. For some objectives, print still offers the most effective way for students to read large amounts of text. It is believed by the university that print is truly the only "anytime-anywhere" medium. Security issues, DOD firewalls, computer-based instruction (CBI) development costs, and lack of bandwidth assure that print has a long future in

Air Force distance learning. It will continue to be used as a supporting medium for most courses, whether they are using interactive television (ITV), audio conferencing, CBI, or online. As soon as technology and quality control permits, some text materials will be delivered electronically for onsite printing and binding.

The Army's Interactive Digital Publications Initiative

The initiative known as Army Doctrine 2015 issued in new interest in interactive digital publications. This initiative supports the CG (Combined Arms Center guidance) to "bring doctrine to life" by augmenting the presentation of text and images with embedded interactive multimedia such as audio, video, animations, and simulations. Users can download enhanced electronic books (e2Books) using Web and mobile technology, resulting in timely, relevant content accessible at the point of need. The interactive multimedia will enhance the user's experience beyond the pages of the publication and across the human senses leading to an enriched learning experience and better comprehension of complex concepts.

During the first year of this initiative, the Army Publishing Directorate began hosting publications developed for eReaders to facilitate easier consumption of doctrine from small mobile handheld devices such as smartphones and tablets.

The Army adopted an eReader as part of its basic software load for all workplace computers. In addition, the Army awarded a centralized multi-year contract to help doctrine developers with the process of converting static doctrine to dynamic doctrine.

Satellite Delivery of Distance Learning

The Army's distance learning via one-way satellite delivery had evolved over the years. Like the Air Force's experience with emerging (and changing) technologies, the Army also experienced a period of time when instruction was broadcast via satellite, effectively. As technologies allowed other methods of more effective distance learning to occur, older technologies became less attractive, less effective, and less used. For example, with the advent of digital television transmission, analog service was no longer a viable option.

While the use of one-way satellite delivery for distance learning of resident training had declined, the opposite was true for distributed learning. The Army's Deployed Digital Training Campus (DDTC), a transportable networked classroom supporting 20 students simultaneously with workstations, uses network collaboration tools, Video Tele-training (VTT). This medium allows access to the Worldwide Web via satellite communications, Interactive Multimedia Instruction, and access to the Army Learning Management System and other Web-based training products and simulations.

The primary objective of the DDTC is to provide the same level of training capabilities to soldiers serving in deployed units as soldiers located at home station. The DDTC is a deployable system enabling group or individual instruction through VTT or collaboration. It allows professional development training through access to current distributed learning products and constructive simulations based training. The DDTC provides a means for the current institutional training base to deliver proponent approved Distributed Learning products and services to deployed forces. It also provides a flexible means to meet surge training requirements. The DDTC provides the capability to access structured formalized training (such as individual Web-based courses and VTT sessions), as well as access to unstructured training through live and online collaboration. It facilitates the transformation of the institutional training base from a centralized resident training environment to a blended resident and distributed training environment. This blended approach lays the foundation for a more flexible institutional training philosophy necessary to support the Army's current wartime training needs and ongoing future force transition.

As of 2016, the Army had reduced requirements for DDTC with no future plans to build more capability. Other technology is being reviewed as a potential replacement in order to keep all Soldiers up to date on training requirements.

The Army supports delivery of distributed learning to its reservists with its Digital Training Facilities (DTF) program. The original commitment was to provide a DTF within 50 miles of all reservists. Over time, and with the proliferation of the Internet, the program had to close some facilities, but still offers access to top-of-the-line equipment and connections allowing access to the Internet and training classes. At this time there are 223 DTFs at 91 installations in the United States, Germany, Belgium, Italy, and Korea.

Computer-Based Instruction

Computer-based instruction (CBI) is also known as interactive courseware (ICW), and interactive multimedia instruction (IMI). All branches of the military have programs using these modes of delivery. Most have evolved to Web-based delivery. With the demand for more and more multimedia, and the resulting strains on bandwidth with Web-based delivery, the program offers options using CD-ROM and digital video disc (DVD). The portable CBI option is also appealing to certain populations, such as Army reservists, who may not have access to computers with connectivity.

The Air Force also has found value in their CD-ROM/DVD offerings and will continue to use the courses that have already been produced. With the development of data-casting, many of these courses will be available for delivery by satellite to local servers without having to modify them to meet the constraints of public Internet delivery. It is expected, however, that with time and funding cuts, many of these legacy CD-ROM courses will migrate to SCORM standards.

E-Learning

The Army offers free, individual Army training for every active Army, National Guard, reservist, ROTC cadet and Department of the Army civilian, through its e-learning program. There are thousands of courses available. Some offer certification, are preparatory programs, or offer other learning opportunities in trade, business, or leadership skills. The program also provides subject matter experts and mentors to support students in their self-development. Other supportive services offered include access to digital books, e-libraries, and online research tools. Language training, one of the most popular features of the e-learning program, is also available to the student, whenever needed, 24 hours a day.

New Initiatives in Distributed Learning

Distributed learning content must be developed for delivery on a variety of platforms. It should contain reconfigurable items, such as video, game-based scenarios, digital tutors, and assessments that are tailored for learners. Content could incorporate the use of social media, massively multiplayer online games (MMOGs), and other emerging technologies. It leverages the power of information and communication technologies (such as simulation, interactive multimedia instruction (IMI), video tele-training, e-learning, and others), and can be either real time (synchronous) or non-real time (asynchronous).

Distributed learning will also continue to support stand-alone learning. IMIs that are self-paced, and offer learning without an instructor, need to serve soldiers and civilians positioned in remote areas, especially where there is little or no bandwidth. This type of delivery is now identified as auto-scoring, which means that either progress or scoring is done by the learning management system and reported using SCORM.

Virtual Worlds

In late 2008, the Air Force began to explore the capabilities of the virtual world with an initiative it christened MyBase. The military was interested in exploring virtual worlds to reduce the time and costs associated with bringing airmen into resident training and to create more realistic experiences for users than those provided by traditional IMI. The Navy Undersea Warfare Center also piloted the use of Second Life for operational testing, training, collaboration, product development, and design.

The National Guard developed its presence in Second Life as Emergency Management Nexus (EM Nexus), a training and preparedness program. EM Nexus is part of the Joint State Response Training System, aimed at civilian responders, emergency operations centers, and joint operations centers. It is a hybrid delivery that combines the functionality of a virtual world with the ability to link to external distance learning applications.

The United States Training and Doctrine Command (TRADOC) set up a virtual experience for civilians to explore a career in the Army. The virtual space included career counseling, presentations on military life, and school benefits. Although there is still interest in the efficacy of virtual worlds for military training, the level of interest is currently mixed.

Mobile Learning

The Army's mobile learning initiative began with the establishment of the Connecting Soldiers to Digital Applications pilot program in September 2009. The pilot was to explore the value of using smartphones to provide soldiers with applications for select administrative, training, and tactical functions. The CSDA set additional goals to evaluate new training approaches that allow Soldiers to learn anytime, anywhere.

The Army sees the next generation learner as part of the digital generation, totally comfortable with the latest media technology. Using this logical extension of distributed learning, there are plans by the Army to supplement classroom learning by extending and partially transferring training content into the soldier's hand through smartphone and other mobile technologies. It provides a means to augment traditional learning with hands-on application of new processes or procedures learned in residence. The Army believes that students learning from hand-held technologies are picking up the course material much faster and with greater retention, resulting in significantly higher graduating scores. This method of learning potentially saves time and money in training soldiers.

The program was widely accepted in the beginning, but slowed when questions of security, cost, content, and networks began to surface. In particular, the program is hampered by concerns about information assurance—to ensure information and data being carried in the smartphone is being protected from inadvertent loss or disclosure. Although most training content is unclassified, there is concern that the content, in aggregate, may be sensitive.

In 2015, the Army designated a capabilities manager for the mobile program. This position is responsible for mobile required capabilities and manages and integrates related deliverables across doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy areas. In addition, this position supports the development, validation, and life-cycle maintenance of mobile learning content, the development and certification of mobile learning applications, and the development and sustainment of the wireless infrastructure in support of Army learning.

As a result of a white paper published on Air Force Future Learning Technology, a number of areas of emerging technology were investigated for potential implementation into the Air Force distance learning capability. Among them were mobile learning and virtual worlds.

Handheld mobile devices have become the center of attention to supplement more traditional training methods. The Air Force has adopted mobile learning to a limited degree as a supplemental

training device. A planned upgrade of the ADLS software and hardware in the 2017–2019 timeframe will bring tremendous mobile access capabilities. Airmen will soon be able to accomplish asynchronous and synchronous learning, collaborate with other learners and employees, and access electronic job performance aids using mobile devices.

The Army Distance Learning Program Modernization

The modernization of The Army Distance Learning Program(TADLP) is an effort to revolutionize the way the Army develops and delivers training and education. This shift is an aggressive and ambitious endeavor that requires a significant change in the current culture. It will also take tremendous teamwork and coordination to adapt and move forward the capabilities that remain relevant while abandoning those that no longer support current and future learning requirements for soldiers and civilians.

The modernization of the Army's Distributed Learning Program is a bold strategy that establishes a continuum of learning throughout the career of the Army professional. It proposes new programs, plans, and policies, risk taking in leveraging new learning and neurosciences, learning strategies, and application of learning technologies in curriculum/courseware design and delivery that will enable the execution of rigorous, relevant, and tailored content at the point of need.

TADLP will offer a single portal to digital resources and connects learners to mentors. It also provides streamlined access to peer-based learning interactions, facilitators, and content repositories that provide learning that allows for career assignment, advancement, change, and the pursuit of personal educational goals.

The TADLP learning framework is learner-centric, provides a career-long continuum, is continuously accessible, offers transparent infrastructure to the user, and supports the learner with subject Matter experts (SMEs), facilitators, digitized learning media, Knowledge Management structures, policies, and resourcing models.

In recent years, the rapid development of computer and communication technologies has established new instructional opportunities in distributed learning. Disruptive technologies—the displacement of a previously used technology—have revolutionized advances and driven transformation, providing the learner with content self-discovery capability, peer-to-peer interaction, and dissemination of experience-based learning. TADLP will use these opportunities to allow active learning using automated and adaptive information extraction, assimilation, and other technology management, to provide soldiers the ability to become adaptive, critical thinkers, able to solve complex problems in uncertain operational environments.

TADLP facilitates the Army Learning Model (ALM) through its robust capability to develop and update engaging technology-delivered DL content. This content can be used in the schoolhouse as part of a blended learning approach, distributed for sustainment training, or accessed via performance support applications.

New Training and Education Models for Military Distributed Learning

The behaviorist pedagogy has focused the military learning model since the late 1960s. Behavioral learning theory begins with a concept of changing behaviors as a result of the soldiers' response to stimuli. This has been especially attractive for use in training (as opposed to educational) programs, as the learning outcomes associated with training are usually clearly measured and demonstrated behaviorally (Anderson & Dron, 2011). According to behaviorist theory, it is the desired outcome, the new behavior, or changes in behavior that is the focus of instruction. This definition fit the military's focus on training tasks: a specific, measurable response to a specific stimulus. These theoretical ideas led directly to instructional designs such as computer-assisted instruction and instructional systems designs.

In line with this behaviorist approach, the Army learning model for instructional development was the Systems Approach to Training (SAT). It served the needs of the Army from about 1973 until just recently, when the model was changed to the analysis, design, development, implementation, and evaluation (ADDIE) process. The previous SAT process followed similar standard design processes, but had an emphasis on the systems approach. To meet the needs of distributed learning with its emerging technologies and blended learning components, the ADDIE process offers emphasis in areas that require greater flexibility while keeping rigorous and relevant training and education needs paramount.

Integrating Social Media and Distance Learning

In the past, the model for military distance learning assumed learners chose DL because of their learning preference. The model was defined by a lack of social presence and the presentation was standalone, without teachers or other students considered.

The learners who chose DL were thought to be autonomous in their learning style, comfortable alone with a book or with computer-based learning. The model persisted for many years in spite of research that indicated the opposite. Anderson and Dron (2011) noted differences between the performance outcomes based on the interaction with an instructor or other learners; with high levels or low levels of social presence.

With the popularity of new Web technology, collaboration between teachers and students offers as much or as little social presences as is required by personal preference. For the first time in 40 years, the Army is changing from its favored behaviorist model of learning.

With the revolutionary Army Learning Concept for 2015, the Army asked: "How must the Army change its learning model from one that barely satisfies today's needs to one that promotes operational adaptability, engages learners, enables the Army to outpace adversaries, and meets the Army's learning requirements in 2015?" (Army Learning Concept, 2015). Anderson and Dron (2011) define this as the so-called fourth and fifth generation distance technologies that incorporate Web technology to create "intelligent flexible learning. It should be noted that none of these generations has been eliminated over time; rather, the repertoire of options available to DL designers and learners has increased.

The Army was searching for a new model to fit the:

> next generation learner [who] must be adaptive on several levels if it is to support the qualities of operational adaptability in the force. First, the Army learning model must develop adaptable Soldiers and leaders who have the cognitive, interpersonal, and cultural skills necessary to make sound judgments in complex environments, from the tactical to strategic level.
>
> *(USTDC Pamphlet 525–8–2, 2010)*

The Army's new learning model requires an "adaptive development and delivery system, not bound by brick and mortar, but one that extends knowledge to Soldiers at the operational edge is capable of updating learning content rapidly, and is responsive to Operational Army needs" (USTDC Pamphlet 525–8–2, 2010). The Army defines the operational edge in terms of placing learning content in the hands of the learner anytime, anywhere and at the time of need.

Perhaps the most challenging of all is the concept of sustained adaptation. This concept uses routine feedback from soldier performance to drive adjustments to curriculum content and learning products. This isn't an adjustment made by training developers; these are adjustments made by technology. Sustaining adaptation includes a capacity to routinely explore and integrate advanced technologies and learning methods to remain competitive and engage learners.

By design, the 2015 learning model must promote adaptable qualities in soldiers and leaders, and be sufficiently adaptable to adjust to shifting operational demands. The solution is a continuous adaptive learning model, a framework comprised of elements that together create a learner-centric, career-long continuum of learning that is continuously accessible and provides learning at the point of need in the learner's career. Transparent to the learner, but integral to the model, is a supporting infrastructure that includes subject matter experts and facilitators from the centers of excellence (CoEs), a digitized learning media production capability, knowledge management structures, and policies and resourcing models that are flexible enough to adapt to shifting operational and learner demands. The model's underlying infrastructure is critical to enabling the shift from a course-based, throughput-oriented, instructor-led model to one that is centered on the learner. Through this adaptive development and delivery infrastructure, the learning model provides maximum opportunities for individual learning that are grounded in schoolhouse experiences, and continue through the career span in a soldiers' career.

The Future of Military DL

Although distance learning has great potential to reduce training costs, provide more training events, and focus on specific training requirements, there are some who still resist its implementation. Often it is resource availability or policy gaps that delay the implementation of expanding distance learning content. Although there is a requirement and a desire for distance learning in many areas, the funding and manpower to make it always lags behind. In 2011, as a result of resource constraints, Army training and education developers were directed to increase the type and number of courses developed for distributed learning. It is likely the other services will also seek new ways to design and develop distributed learning and stay within a tightening budget.

In her comments to the Army training and education community, the TCM-TADLP commented on the state of DL. We are "embarking on a revolutionary modernization in the way the Army develops and delivers learning content . . . an aggressive and ambitious endeavor that requires a significant transformation of our current culture." She called on all stakeholders to adapt new and emerging technologies and be prepared to retain the relevant and abandon what no longer supports the new Army Learning Model. Military DL will remain efficient and effective while engaging soldiers, sailors, airmen, and civilians into the 21st century.

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TEACHING SCIENCE AT A DISTANCE

Dietmar Kennepohl

Introduction

There has been a well-documented and progressive decline in student participation in mathematics and science[1] at both school and university levels in several industrialized countries around the world (James, 2007; Falk et al., 2015). Nevertheless, the overall demand for learning science has also taken on a renewed urgency (Commission on Mathematics and Science Education, 2009; UNESCO Education Sector, 2011; Bradforth et al., 2015) and is globally exceeding the capacity of established educational routes. Together, the challenges of participation and capacity are becoming more pressing as we consider science education in the 21st century. Online distance delivery offers practical alternatives to traditional on-campus education, but teaching science online and at a distance can be more demanding than—and certainly is not as common as—many other disciplines. There is a variety of reasons for this, of which the most obvious is dealing with the practical and applied components (laboratory, clinic, fieldwork). This chapter will take a look at higher education teaching and learning in science with special emphasis on practical work.

Science Culture

Every discipline and sub-discipline has its particular epistemology, language, culture, and way of doing things. Students are not merely learning facts and concepts; they usually undergo an apprenticeship within their discipline. In other words, they effectively learn within the context of being, for example, an electrical engineer or a microbiologist or a mathematician. So, in considering teaching and learning in science, it becomes important to appreciate some features that may be particular to the science culture (Matthews, 1994).

Science is both content (body of knowledge) and process (way of knowing). The approach to teaching and learning often tries to reflect scientific methodology or process. That is, students are expected to state a problem, ask questions, make observations, keep records, offer explanations, create a design or carry out an experiment, and communicate findings with others. The vehicle to learning is problem solving and scientific inquiry, and this forms the model for navigating and dealing with hypotheses, facts, laws, and theories. It is therefore not surprising that the practical components are at the heart of most science programs, or that more research activities are being introduced at the undergraduate level (Taraban & Blanton, 2008). Still, this discovery-, problem- or inquiry-based

approach has always been difficult to do on a large scale without falling back into a more expository (demonstration) mode. However, the larger problem in science is the tyranny of content. Most science and engineering courses are packed with content, activities, multiple tasks, and choices that often lead to cognitive overload and an actual decrease in learning (Impelluso, 2009; Sweller, Ayres, & Kalyuga, 2011). This volume and complexity of content and concepts is a great challenge, but the actual order in which the learner tackles these is also important and, in some cases, can make learning more difficult (Smith, Mulhall, Gunstone, & Hart, 2015). The sciences have a long tradition of scaffolding and building up basic skills first before getting to the heart of and usually the interesting bits of the discipline itself. "The teaching of math and science suffers from being all scales and not enough music" (Tobias, 1990, p. 42).

The Approach to Learning Science

As suggested earlier, the teaching of science has a well-founded constructivist and experiential perspective (Bailey & Garratt, 2002). In the context of the aforementioned content and process components in science, science educators (both on campus and at a distance) use many of the same tactics for teaching and learning as their colleagues in other disciplines. That is, long-established principles like student engagement, interaction, prompt feedback, time on task, creating respectful/open learning environments, and clear expectations are valued and employed (Chickering & Gamson, 1987). A recent paper issued from the Australian Council of Deans of Science also provides a brief introduction to some current ideas from university-level science education research to improve the quality of learning and the student experience (Overton & Johnson, 2016). Still, doing this online and at a distance can present some additional challenges. Miller (2008) provides a good overview of some approaches and addresses myths surrounding online teaching in the sciences. However, there are three areas that warrant particular attention for the sciences, namely: (a) concept inventories and misconceptions; (b) integrating information and communication technologies (ICTs); and (c) laboratories.

Determining a student's concept knowledge was first made popular in the area of physics (Hestenes, Wells, & Swackhamer, 1992), but is now being actively investigated by science educators in numerous other disciplines. The idea of the concept inventory is to carry out measurements with a multiple-choice test before and after a course to identify where and how much learning has occurred. Surprisingly, in one physics course, some negative learning was actually reported (Savinainen & Scott, 2002). Nevertheless, both the culprit and opportunity is seen as learner misconceptions (Duit, 1999). The concept inventory provides the diagnostic window to target specific misconceptions in the course, which can eventually be turned into learning opportunities. The suggested approach is to lead learners through a sort of conceptual conflict (Hewson & Hewson, 1984) whereby they first predict what should happen, then are confronted with factual data, and finally, are asked to analyze and resolve any discrepancies with the original prediction. This process closely parallels scientific methodology. Success greatly depends on judging the amount of intervention by the teacher. Practice has shown that merely telling students what the correct concept entails, without having them work through it themselves, is ineffective (Guzzetti, Snyder, Glass, & Gamas, 1993). Conversely, having students figure it out themselves without some guidance can also be ineffective, and sometimes even reinforces misconceptions already held. There are certainly detractors of concept inventories, or at least ongoing discussions as to what it is actually being measured and how one can best use the information (Smith & Tanner, 2010). However, they have sparked interest within the science education community, which is emphasizing connections to learning outcomes, fundamental principles rather than just individual facts, and finding opportunities to incorporate the scientific process into the learning process.

There are several key areas where ICTs can significantly enhance the learning experience for the student in the sciences, including providing: (a) access to information and data; (b) networking and collaboration; and (c) automated feedback and assessment.

1. Today, information is ubiquitous, but quality and reliability can be variable. Learners need to know how to access and assess information, as well as how to manipulate large amounts of data. While these are desired 21st century skills for any area, research and development in the STEM disciplines builds directly on previous knowledge, such that ready and timely access is a particularly strong driver for ideas and innovation (Harnad, 2011).
2. Collaborative interactions supported through ICTs can help to develop and maintain scientific knowledge and research networks. For scientists, this can also extend to real-time sharing of data and instrumentation, which often also means pooling cost and effort. Networking and collaboration not only supports learning interactions, but it also becomes a precursor of how modern scientific research is done in the real world.
3. Finally, the power of ICTs to automate some functions can provide prompt feedback and assessments to reinforce skills and concepts, while giving the learner more working independence with drills, exercises, and self-tests. Some open universities (where course prerequisites are minimal) are exploring self-diagnostic tests to help guide and advise students and prospective students (Jordan, 2011; Kennepohl, Guay, & Thomas, 2010). Automation can be seen as part of an overall course delivery strategy to deal with the routine to make more time for high-touch interactions that involve more sophisticated and non-routine questions. While this approach is arguably true for any discipline, the number of concepts and skills (and sub-skills) potentially required makes automation well-suited in many science disciplines.

Role of the Teaching Laboratory[2]

The rationale for having practical work in the sciences, the role of the teaching laboratory, and its changing nature have been discussed and will continue to be discussed at length (Bennett & O'Neale, 1998; George, 2003; Lagowski, 2005; National Research Council, 2003; Jeschofnig & Jeschofnig, 2011). Examining the literature, one immediately realizes that science educators place great value on the teaching laboratory. Others, however, have suggested that laboratory work is nothing more than a rite of passage for students for whom it is often only a historical tour of the past (Kennepohl, 2007; Kirschner & Meester, 1988). According to this view, laboratory work becomes a requirement by nostalgic professors who had to do the same when they were undergraduates. Quite frankly, for distance educators, it would be much easier to deliver science courses without a laboratory component. Some teachers have also observed that their students, essentially motivated by marks, are uncomfortable doing practical work and view it as merely another form of assessment (Byers, 2002). This compels us to ask the first fundamental question: why do we require laboratory work?

The design of any laboratory component is often done to meet a variety of stated pedagogical aims. The most general one is the reinforcement of course concepts through illustration and "making it real" for the student. This is followed by the development of techniques and skills that are either cognitive or practical. It could include skills such as physical manipulations, making observations, problem solving, data handling, interpretation of results, time management, and dealing with errors. Finally, many teachers cite the laboratory environment as an opportunity to inspire students and make concepts impressive enough to remember (Boschmann, 2003; Casanova, Civelli, Kimbrough, Heath, & Reeves, 2006; Deacona & Hajek, 2011; Ross & Scanlon, 1995; Rudd, 1994).

Together, this forms the rationale—or, more precisely, the collective aspiration—of instructors who integrate laboratory components into their science courses. However, results have been variable,

and there is an ongoing debate as to what degree laboratories are successful at meeting the stated pedagogical aims listed earlier. Because laboratories are inherently difficult to deliver at a distance, how they are used—and even if they are needed—have always been pressing considerations for the distance educator. More recently, and especially with increased fiscal constraints, this discussion is now also including many teachers at residential institutions. In short, the second fundamental question we should be asking is: how can we make teaching laboratories more effective?

Designing the Laboratory Component

There is a lot of good information available on laboratory course design and approaches to teaching (Byers, 2002; Psillos & Niedderer, 2002; Sunal, Wright, & Sundberg, 2008), as well as integrating laboratory-based activities with the coursework (Mawn, Carrico, Charuk, Stote, & Lawrence, 2011). However, the majority of teaching laboratories are still set up as expository instruction or so-called cookbook science. Practicing science educators continually look for improvements in their laboratory components and regularly share experiments and approaches at conferences and in science education journals. However, at the post-secondary level, most instructors have no formal background in pedagogies, and so the number of learning theories, models, and even language used in education to describe laboratory design can be confusing and overwhelming. Indeed, it would be fair to say that most practicing educators in science see laboratory work as either being traditional (cookbook) or nontraditional (everything else). Domin (1999) provides a useful and simple taxonomy of laboratory instruction styles which bridges this gap. The four distinct styles suggested are expository, discovery, inquiry, and problem-based, such that each style is characterized by whether the approach is deductive or inductive, and whether procedures are generated by the student or the instructor. This is a helpful and symmetrical framework for science educators in considering incorporating laboratory work into a course. In addition, this taxonomy also mirrors the three-phase structure of scientific research as described by Kuhn (1970), whereby normal scientific research is associated with problem-based instruction, research validation as essentially expository instruction, and discovery research as both discovery and inquiry-based instruction. Domin argues that having the student only experience one or two instructional styles gives "an incomplete depiction of the scientific enterprise" and active participation in all three of Kuhn's phases is encouraged (Domin, 2009, p. 276).

A variety of methods is being used to deliver the practical components of a course to distance learners, including: (a) supervised face-to-face sessions offered in a concentrated format on campus or at regional sites or in the field; (b) home study laboratory kits; (c) virtual laboratories (includes video demonstrations); and (d) remote laboratories. The first type, with the exception of having more flexible locations and times, is almost exactly what one would find at a residential institution. However, the other three would be viewed by most science educators as alternative delivery modes.

The gold standard has essentially been the face-to-face model, and anything other than this traditional approach is subject to intense scrutiny. This perspective is commonly held despite reports in the literature that the alternative modes are essentially equivalent to—and in a few cases better than—face to face (Corter, Esche, Chassapis, Ma, & Nickerson, 2011; Doulgeri & Matiakis, 2006; Fiore & Ratti, 2007; Lindsay & Good, 2005; Smetana & Bell, 2011). Indeed, critics of alternate modes cite either a need for a "proper" laboratory environment, with all of its atmosphere, noises, smells, and the haptic experience of experimenting, or a supposed lack in alternative modes of direct student-student and student-instructor interactions. While both laboratory environment and human interaction can and do lead to both formal and informal learning, we know that other forms of interaction in other environments can equally well lead to learning (Anderson, 2003).

Home-Study Laboratories

One strategy is to have learners carry out laboratory work off-campus on their own. Examples of this include: (a) the use of laboratory kits; (b) practicing kitchen science (using common household items); and (c) undertaking self-directed fieldwork. The first two approaches are most common and have been used for some time around the globe, including in Australia (Hall, Jones, & Palmer, 2006; Lyall & Patti, 2010; Wright, Mosse, & Panther, 2016), Africa (Kriek & Grayson, 2009), the United Kingdom (Burnley, 2008; Ross & Scanlon, 1995, pp. 137–145), Canada (Al-Shamali & Connors, 2010; Kennepohl, 2007), and the United States (Jeschofnig & Jeschofnig, 2011; Reeves & Kimbrough, 2004). In contrast, self-directed fieldwork done in the earth sciences and some life sciences is not as common, but is gaining popularity (Downing, 2016; Reuter, 2016). One of the preferred approaches to fieldwork has been the "urban trail" model whereby students explore their local environments using some generic guidance (Dove, 1997). With the development of GPS technologies and access to mobile devices, there is an expectation that self-directed fieldwork will become a richer experience and increase in popularity.

Although home-study laboratories have many of the aims, concerns, and approaches in common with traditional residential laboratories, there are some notable differences. The most obvious is that they offer the learner great autonomy in space and time, which is consistent with the notion that distance learners tend to be self-directed, seeking control of their own learning outcomes (Moore, 1983; Paulsen, 1993). While students enjoy the freedom offered by home-study laboratories, they are also isolated. This brings us to the second notable difference. The home-study laboratories possess a strong student-content component, with student-teacher and student-student interactions being limited to remote communications (email and phone). Anderson's equivalency theorem suggests that deep and meaningful learning should still be supported with this type of mix (2003). The third notable difference is the context of the home-study laboratory itself. The teaching laboratory experience is not only an important vehicle for learning; it also contextualizes how a scientist might think and operate. Home-study experiments are brought directly into the home, and therefore science is no longer viewed as something that is only done in the laboratory. That science is all around us and a part of our world is an important message that a lot of science educators try to convey to their students. Home-study laboratory work is an excellent way of doing this and arguably should be part of any undergraduate science program.

In addition to these differences, there are other important factors to weigh when considering using home-study laboratories including cost, logistical complexity, added capacity, and experimental sophistication. It is often assumed that home study is substantially cheaper and easier compared with running residential laboratories. At least one audit of institutional costs for chemistry laboratories showed that the residential mode was more economical than the home-study mode (Shaw & Carmichael, 2010). The particular model of home study can also influence who carries the expense. For example, employing kitchen experiments or having students purchase commercially assembled kits provides savings for the institution, but moves the cost to the learner (Jeschofnig & Jeschofnig, 2011, pp. 57–65). While kitchen science can provide a solid non-threatening introduction to laboratory work, it is also particularly problematic if overused. It can be aggravating for the learner to assemble the needed materials (Jeschofnig & Jeschofnig, 2011, p. 58) and it may not meet the expected level of sophistication for a post-secondary science course (Kennepohl, 2007). Still, when compared with the face-to-face option, distance students seem to prefer the flexibility of doing laboratory work at home, which is reflected in reports of dramatic increases in course enrolment and laboratory participation when employing the home-study option (Al-Shamali & Connors, 2010).

For numerous reasons, including access to specific required equipment, facilities, chemicals, and specimens, as well as safety concerns, not all laboratory work can be accommodated through home study. However, other alternatives do exist.

Virtual Laboratories

Simulations have been with us since long before modern computers were on the scene, with a long history in such fields as medicine (Satava, 2008) and the military (Oriesek & Schwarz, 2008, pp. 10–11). However, it was the development of flight simulators that popularized the idea of using simulations for training and learning. Currently, training simulations are used in many areas including operating vehicles and marine craft, healthcare, air traffic control, different military applications, industrial processes, production, logistics, business, finance, economics, history, science, engineering, and education, among others. Some simulators are incredibly complex and realistic, but also very expensive. As educators, we are more interested in the affordable and accessible simulations available as learning tools for our students.

Many science educators have found this to be a great way to teach students (especially new students), because the overall cognitive load is smaller than in the equivalent real-life situation (Kirschner, 2002; Sweller et al., 2011). There is certainly a natural assumption that the more lifelike the virtual environment is (i.e., higher fidelity between real and virtual), the more learning will occur. While this is an intuitive assumption, it is not always true. A very realistic simulation is often better suited in training and challenging the expert, while the beginner is usually better off with a simplified version of reality. While this is good news for keeping costs down, some designers underscore the importance of having sufficient reality cues present in the simulation to engage the learner (Swan, 2008). In short, the challenge for the educator is to determine in specific situations exactly what subset of reality provides the desired learning environment. Potkonjak et al. (2016) provide an up to date critical review of virtual teaching laboratories in science, technology, and engineering.

A major strength of the virtual laboratory is that it allows a great deal of student autonomy. Computer simulations can provide continuous and automatic feedback, and the learner is in control within a safe environment—not just physically safe, but having the knowledge that work will not be lost, or can easily be redone. Furthermore, one can speed up or slow down different components of the work, which provides time to explore and relieves the student of tedious work not directly related to learning. In the "sandbox" of the virtual laboratory, one can explore all sorts of "what if " scenarios without consequence, which might be impractical in a real practicum. Many of the design features employed in gaming, especially those that engage the learner, can work quite well in the virtual laboratory, allowing opportunity to exploit the strong connection between play and learning (Kolb & Kolb, 2010). Other advantages of the virtual laboratory include increasing ICT literacy, the ability of the system to track students, and the potential automation of some of the assessment. Conversely, there are also several disadvantages. While there is room for exploration by the learner, a simulation cannot deal with alternate models because one is bound by what is programmed into the simulation. Often, some sort of technical and/or teacher support is required. As with the home-study laboratories, there is also isolation from direct human contact and, again, there is a limit to what can be accommodated (not everything is readily simulated). One curious disadvantage of the virtual laboratory is that it is very difficult to simulate non-ideal situations and errors that are so easily found in real life.

Remote Laboratories

Scientists and engineers not only employ remote control when an experiment or instrument is physically inaccessible (e.g., because of location or danger), they also find it an excellent method for sharing expensive equipment and facilities. Remote control over the Internet for teaching experiments was first established in the early 1990s (Cox & Baruch, 1994; Penfield & Larson, 1996). The number of examples of remote access for teaching laboratories in the natural and physical sciences is small, with the bulk of contributions coming from the areas of robotics, computing, and engineering.

A worldwide inventory of 355 remote controlled laboratory sites done in 2010 identified fewer than five remote experiments for teaching chemistry and biology, while the bulk were dedicated to engineering (64%) and physics (36%) (Gröber, Eckert, & Jodl, 2014). Together, a summary of remote laboratory sites found online (Le Couteur, 2009), a review of platforms and applications (Kolias, Anagnostopoulos, & Kayafas, 2008), and a review of observations and findings (Alkhaldi, Pranata, & Athauda, 2016) give a good initial overview of the range of teaching experiments available.

In contrast to virtual laboratories, remote access allows learners to physically carry out real experiments online. Students obtain real results using real substances and reach real conclusions, just as they would if they were in the laboratory with the equipment. Remote laboratories represent the best alternative to working in a real laboratory, and are being employed in four ways: (a) to allow observations of natural phenomenon or experiments; (b) to carry out measurements; (c) to manipulate instruments or physical objects in experiments; and (d) to facilitate collaborative work at a distance (Kennepohl, 2010).

Similar to the home study and virtual laboratories, the student-student and student-instructor interactions are usually reduced or altered in the remote laboratory. There is also the additional challenge of making the student comfortable and functional within the remote laboratory environment itself. Early accounts focused mostly on the technology, feasibility, and the ability to have the learner connect with and control an experiment remotely. In later studies, there was more emphasis on pedagogy and learning design. Teachers certainly have many of the same aims and employ many of the same strategies as they do in the traditional proximal laboratory. So, in addition to the necessary infrastructure (system architectures, policies, logistics), they also discovered that successful remote laboratories are self-contained, intuitive, and designed with a seamless pedagogical front end to facilitate the high level of student learning and skills development to allow experiments to be carried out at a distance (Azad, Auer, & Harward, 2011). The value of the opportunity to do real experiments—as opposed to simulations—cannot be overstated, and has often been stressed by researchers in the area (Cooper, 2005; Kennepohl, 2010; Machotka, Nedić, Nafalski, & Göl, 2010). Since these remote laboratories exist in the physical world with real experiments on real samples, there is also the possibility of operational problems, errors, and non-ideal results. In moderation, this is beneficial for the student and should be seen as an opportunity to encourage learning.

A common problem faced by science educators is securing the financial commitment to build and maintain remote laboratories. There are certainly examples of many initial efforts on various websites that reflect a keen interest. Unfortunately, the fact that many of those remote laboratory websites are currently not functional points to the exploratory nature of this mode of delivery and a history of serious underestimation of what is needed to maintain working experiments. Fortunately, various inter-institutional collaborations, communities, and consortia are emerging to share the cost and the benefits of remote laboratories, as well as some commercial interests offering remote laboratory services. For example, the STaRBURSTT (Science Teaching and Research Brings Undergraduate Research Strengths Through Technology; www.as.ysu.edu/~adhunter/STaRBURSTT/index.html) CyberInstrumentation Consortium in the United States has a network over several institutions of single crystal x-ray diffraction instruments. In Europe, LiLa (Library of Labs) is an initiative of eight universities and three enterprises (Richter, Tetour, & Boehringer, 2011) and RCL (Remote Control Laboratories), based at the University of Technology Kaiserslautern in Germany, in addition to providing physics experiments for its own students, is working with partners to do training and outreach (Eckert, Gröber, & Jodl, 2009). Other sites like MARVEL (Virtual Laboratory in Mechatronics: Access to Remote and Virtual e-learning) at the University of Bremen in Germany (Müller & Ferreira, 2005) and NetLab in Australia (Machotka et al., 2010) have opened their laboratories for others to use. Branan, Bennett, and Braithwaite (2016) provide an excellent review and assessment of how these networks can work successfully. Certainly, to avoid developing everything

from scratch and unnecessary duplication, one can envisage future networks of remote laboratories sharing or hosting experiments.

Getting the Right Mix of Laboratories

Studies indicate that particular components of learning are better suited to different modes of delivery (Lindsay & Good, 2005). In a comparative study of different laboratory models, Elawady and Tolba (2009, p. 92) describe the current situation as an "unresolved debate" with each type of laboratory having its own "advocates and detractors." A recent meta-study of traditional laboratories vs. nontraditional (virtual and remote) laboratories showed no substantive differences in learning outcome achievement (Brinson, 2015). While the question of "which is best?" may not be definitively settled, the more interesting and promising work is being done around combining the different modes to optimize convenience and learning (Corter et al., 2011; Ma & Nickerson, 2006; Pyatt & Sims, 2011). For example, students could prepare and leave samples on campus and then carry out the instrumental analysis from home as a remote laboratory, or they might carry out some initial experiments with a home-study kit and then complete the last few experiments on campus. However, the most common combination has been using computer simulations to prepare the student for the face-to-face laboratory, just like training a pilot with a flight simulator. The "virtual-plus-real" combination often works better than either on its own (Jaakkola & Nurmi, 2008; Zacharia, Olympiou, & Papaevripidou, 2008). It is interesting to note that the best order for the combination is not always from simulation to reality. In at least one case, switching the order, starting with reality and then carrying out virtual work afterwards, produced better results (Smith & Puntambekar, 2010).

On the Horizon

Many technological tools are emerging which not only can be employed directly by the science educator (Dede & Barab, 2009), but will fundamentally change our approach to learning. These include the increased availability of mobile devices and interest in mlearning (Chao, 2011; McCollum, 2016). Portable GPS-enabled gadgets have found strong support in areas such as health and medicine (Premkumar, 2011), and in several field sciences (Miyata, Ishigami, & Sannomiya, 2011; Collins, Davies, & Gaved, 2016), as well as occupations requiring both physical mobility and the ability to access and move information. Examples outside of these disciplines include mobile phones used as flash cards (Sauder et al., 2009) in biology and chemistry, and accessing remote laboratories (Orduña, García-Zubia, López-de-Ipiña, & Irurzun, 2011). It is certainly expected that as mobile devices and their networks become even more affordable and sophisticated, they will be further incorporated into science courses. One interesting development of mobile devices is their popularity in informal science settings (Scanlon, Jones, & Waycott, 2005; Crompton, Burke, Gregory, & Gräbe, 2016). Considering that the average university graduate's science knowledge already comes mostly from informal sources (outside the classroom), it will be curious to see the impact of mlearning on the science literacy of the general population.

Indeed, the aspiration to "science for all," with its goal of universal and open access to science, has really benefitted from distance education and new technologies. Of particular interest is the whole movement around open educational resources (OERs), which has presented us with a new way of doing things that should realize savings and increase access (Baraniuk, 2008; D'Antoni, 2009). Within science education, there are related movements that complement and reinforce OERs, including resource-sharing in remote laboratories (discussed earlier), as well as e-science (Bohle, 2013) and cyberinfrastructure-enhanced science initiatives (National Science Foundation, 2012). One subset of OERs that is worth noting is the often over-hyped massive open online course (MOOC). Spector (2017) provides a good review of MOOCs, wherein he also encourages the reader to view them not

as a new form of a courses but as "communities of subject-specific participants" (p. 135). Given the expense of creating or buying resources in the science-related disciplines, coupled with the fact that scientific principles are very transportable, OERs seem like a natural option.

Connectivity to both content and people in digital networks is very exciting (Jones & Sclater, 2010), and science educators are just now starting to explore the possibilities, with cautious optimism. The initial appeal here is student engagement and interest, because there is an impression that the new generation of learners are digital natives who are not only attracted to this, but are expecting it. However, the stronger draw for science educators is the ability to have students collaborate (and learn to collaborate) ideally using a scientific inquiry approach, which is analogous to what one would find in scientific research networks. At the same time, this digital connectivity affords the learner numerous opportunities and choices independent of many traditional barriers, well known to distance educators (Boschmann, 2010). However, there is concern here that without some framework or guidance, the high degree of freedom and large number of choices could potentially inhibit learning (especially at the undergraduate level).

One advantage of having learners in a digital environment is that the activities generate a lot of data that can be tracked and analyzed. Marketing and business firms have been collecting and analyzing information on their customers for years. The area of learning analytics is promising to offer teachers and institutions a similar way to inform their decisions around teaching and learning (Siemens & Long, 2011). The insight offered from actual performance, choices, and preferences of learners, in addition to instructor intuition or student evaluations, will be profound in shaping future learning environments. At the moment, learning analytics are being used in a rudimentary ways, such as determining an individual's preferred learning style or identifying students that are at risk in a course. However, we may not be that far away from having courses literally adapt to the student, rather than the other way around (El-Bishouty, Saito, Chang, & Graf, 2015).

Teaching science-related disciplines online and at a distance is both different and difficult. The approach needs to take into account the nature of science, the scientific community, as well as practical considerations for that crucial laboratory component, which for the distance educator may be the most challenging part. ICTs are having a great impact on how we teach and learn and the sciences are no different in that respect. The new technologies have become more than tools; they require us to change the way we teach—to do those things we have always wanted to do. We can move from content to activities and have self-directed learners who can collaborate and understand how to use information and not just memorize it. Together with the student, we have the opportunity to create flexible and accessible learning environments for the individual.

> I never teach my pupils; I only attempt to provide the conditions in which they can learn.
>
> —*Albert Einstein*

Notes

1. This chapter will use the term "science" to refer in general to all science- and technology-related disciplines, including health sciences and engineering.
2. Teaching laboratory includes any practical course component including clinical and fieldwork.

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35

PRIVATE AND FOR-PROFIT INSTITUTIONS

Evolution and Accountability

Shari L. Jorissen

Introduction

Higher education institutions have three functions, which are: (a) engaging in teaching students; (b) conducting research; and (c) serving the public good (Anderson & Taggart, 2016; Longden & Belanger, 2013; Kinser, 2006; Pucciarelli & Kaplan, 2016). While institutions have historically been able to conduct these activities funded by government entities and donations, the decreasing availability of public funds and increasing technology have resulted in a trend in higher education to operate more like businesses in order to continue to engage in these necessary functions of education in more efficient and effective ways. This ongoing evolution has resulted in additions to private higher education institution as well as the for-profit educational institution portion of the sector. According to Longden and Belanger (2013) and Pucciarelli and Kaplan (2016), the evolution of higher education has been similar to other industries (such as healthcare) whereby the benefit to the public good is emphasized, but there is also a need to cut costs and maintain profitability in order to remain self-sustaining.

Public, Private, and For-Profit Higher Education Institutions

Public, private, and for-profit educational institutions are similar in that they provide educational opportunities to students, but are different when it comes to how funding is procured, tax responsibility, and what is done with any "profit" that is made by the institution (Longden & Belanger, 2013; Morse, 2015; Sipley, 2011). Public institutions are considered "owned" by the state and include state universities, colleges, and community colleges. These institutions are generally 80–90% funded by the state, and students who are residents of the state pay a lower tuition rate to attend the institution than do residents of other states (Sipley, 2011). Non-profit entities, like public institutions, must abide by the concept of the *non-distribution restraint* (Shireman, 2016; Valentinov, 2008). The non-distribution restraint is a business concept that indicates that non-profit organizations must ensure that: (a) any donations will not be appropriated as profit; and (b) profits will not be taken by administrators of the institution, so it is implied that the organization will not cut corners on the quality of the services/products offered.

Private non-profit educational institutions are similar to public higher education institutions, as they are also generally non-profit, which means that they also follow the non-distribution restraint concept (Shireman, 2016; Valentinov, 2008). However, the main difference between private and

public institutions is that private institutions do not receive funding from the state (part of state's annual budget), although students may still be able to use federal financial aid funding to pay for educational expenses if the institution qualifies to receive these funds. The lack of state subsidies toward educational expenses may result in students being responsible for higher costs of attendance. Donations are often accepted by private institutions, as well, and these institutions may have substantial endowments, but they are not able to pay out these donations, and any profit made through tuition as "profit" and need to reinvest the funds into the operation of the institution so as to reduce the actual amount that students pay to attend the institution (Shireman, 2016; Valentinov, 2008).

For-profit education institutions have existed since the 1870s, and fall into one of two categories (Morse, 2015; Sipley, 2011). The first is much like the traditional university structure whereby the institution offers bachelor's, master's, specialist, and doctoral degrees; and the second are those that are often referred to as vocational/trade schools that offer programs in more applied trade education (Morse, 2015). For the purposes of this chapter, the first category of for-profits that runs parallel to the traditional university structure is discussed. One of the main differences between this sector and public and private institutions is that for-profits are not bound by the concept of non-distribution restraint. Instead, for-profit institutions are not only responsible for providing the three primary responsibilities of higher education (teaching, research, and serving the public good), but doing so while generating a profit that is distributed to stakeholders in the organization (Miller, 2013; Morse, 2015; Pucciarelli & Kaplan, 2016). Like private institutions, for-profit institutions do not receive state subsidies that would reduce cost to the student, but also do not have endowment funds like private institutions may have that could be used to reduce the cost to the student. For-profit institutions pass the cost of the student's education directly to the student so the overall cost can be seen as higher than other types of institutions if subsidies, scholarships, and application of endowments are not taken into consideration in the student cost of public and private non-profit education.

According to Iloh (2016), over 2 million students are enrolled in for-profit institutions and these students are "more likely to be older, women, students of color, and come from lower-income and less educated families" (p. 428). Marginalized by traditional post-secondary education options, these students have looked for an educational experience that meets their needs in regard to the offered educational experience and flexibility which has led them to the for-profit sector (Hodgman, 2014; Miller, 2013). For-profits (like public and private non-profits) have academic, business, and marketing entities in the organization that are responsible for different functions (Hodgman, 2014). The academics are responsible for ensuring academic quality in newly created programs, as well as continuous improvement of those programs (including traditional functions like accreditation—specialized and regional, academic program reviews, co-curricular reviews, learning outcomes assessment, etc.), the business portion of the organization focuses on costs, return on investment, profits, enrollment projections, and business analytics in these areas, and the marketing entities work with both the academic and business facets of the organization in order to do market research to determine programmatic needs and potential new programs, determine international areas to expand, and work with the marketing of the institution. While other types of institutions have these facets, as well, more emphasis may be placed on the business and marketing aspects of the institution (Miller, 2013) in order to ensure that the institution is operating while keeping cost savings and profit in mind, and the marketing in public and private institutions may focus more on branding of the institution in order to maintain public and alumni support.

Trends

According to de Boer et al. (2002), the three primary trends in higher education that may be related to the evolution of the types of institutions offering higher education are technology developments, marketization, and the globalization of higher education.

Technology

Technology available to education programs has been linked to three historical generations of distance education, including the first generation of correspondence study, the second generation of multimedia distance education, and the third generation of computer-mediated distance education (Nipper, 1989, as cited in Sumner, 2000). The third generation of computer-mediated distance education has been seen as one of the main catalysts for the rise of for-profit higher education institutions, as they have been willing to embrace technology, especially online education, in order to offer educational opportunities to individuals who may not have historically been able to engage in traditional higher education offerings due to access, scheduling, and work-life balance issues in traditional programs (Appel & Taylor, 2015; de Boer et al., 2002; Sumner, 2000).

Marketization

According to de Boer et al. (2002), marketization includes "the spread of the market discourse, the massification of higher education, the increasing number of private providers, the rise of (global) markets for education and research" (p. 12). Higher education institutions are increasingly expected to include not only students and society as a whole as part of the greater good that they serve, but are also expected to fulfill the needs of employers by providing training to students on skills needed by local employers (de Boer et al., 2002; Miller, 2013; Youssef, 2014). This has changed the direction of the historical view of four-year higher education institutions, and those that offer graduate level education, more toward the philosophy of vocational schools that have been more focused on skills needed by employers and to degrees that would result in more specific employment outcomes. Traditionally, for-profit and private institutions have focused more on these niches in education and provided more career-oriented education. However, this change in society's view of higher education, and the use of public funds to finance education, has also led to additional legislation by the federal government using employment outcomes to measure the success of higher education institutions (Hentschke & Parry, 2015; Hodgman, 2014; U.S. DOE, 2016b; U.S. Senate, 2012).

Globalization

Globalization and internationalization has continued to be a growing issue in higher education as the development of online distance education, and increased technology in other countries, has expanded the potential student base from those who live in the area of the institution to those who can reside anywhere in the world and still obtain a degree from the institution (de Boer et al., 2002; Youssef, 2014). Public institutions are attempting to have students attend their institutions from other states and countries through the use of online programs, but also do not necessarily want other public, private, and for-profit institutions to be able to offer their online (borderless) programs to their potential students. This has resulted in states regulating who can offer educational opportunities in their state, and may require institutions wishing to offer students from the state access to undergo an annual application/reporting process to continue to get permission to operate in the state.

Perceptions

The perceptions of higher education vary greatly depending on the level of degrees offered by the institution, enrollment size, history of the institution, and if they are a public, private, or for-profit institution (Sladek, 2014).

Employer and Public Perceptions

According to Deterding and Pedulla (2016), there are many hiring models that depend on using educational credentials as a way to be able to assess an applicant's skills and abilities, as well as their potential future job performance. Employers generally use degrees earned as a way to determine if a potential employee has the training necessary to do the job that they are hiring for, but this model depends on the skills and knowledge of graduates being the same, or very similar, no matter where the degree was earned. With so many institutions of different types (public, private, for-profit) in existence, it can be difficult for employers to understand: (a) what type of institution the degree was earned from; and (b) what the quality of the education the candidate received at that institution.

The public is also not sure how to evaluate the differences in institutions of higher education based on type, or what type the institution is, even though different organizations have attempted to develop ways for the public and potential students to weigh their options and the quality of these institutions (Anderson & Taggart, 2016; Appel & Taylor, 2015). Institutions of higher education have mandatory reporting that they participate in including submitting data to Integrated Postsecondary Education Data System (IPEDS), which is used to collect, validate, and track information on institutions that receive Title IV funding. One of the issues with this system is that the student population required to be reported in IPEDS may not be the primary population served by the institution, so the data reported to that system is limited. Many members of the public also depend on ratings that can be found in different publications such as the *U.S. News and World Report* college rankings (Eaton, 2012). The issue with this is that many for-profit institutions either choose not to participate in these ranking systems, the data that they collect may not apply to the institution, or the institution may not provide enough data to be ranked (Anderson & Taggart, 2016).

Cost and Funding

Approximately 96% of students who attend for-profit institutions access student loans in order to pay for their education which, in combination with the large numbers of students choosing the for-profit institution option, has brought focus to this sector of higher education and how federal financial aid, including the student loan system, is being used and what the return on investment is for the student and the government (Iloh, 2016; Morse, 2015; Shireman, 2016). While private institutions also cost more than public institutions and the students may also draw on federal financial aid, private institutions may not be under the same level of scrutiny as for-profits due to the perceived level of quality, more restrictive admission requirements, as well as their non-profit status.

Many researchers have focused on the negative perceptions of for-profit institutions (Anderson & Taggart, 2016; Lindgrensavage, 2016; Nelson, 2014; Shireman, 2016; Sipley, 2011), but this has not always been the case. For-profit institutions were initially founded in the late 1800s as providers of business and manufacturing education (Sipley, 2011). Federal financial aid funds were only allowed to be used at public and private non-profit institutions, but this was changed in 1972, resulting in an influx of institutions in the for-profit education sector (Anderson & Taggart, 2016; Hodgman, 2014; Lindgrensavage, 2016). The funds that became available under the GI Bill also added to the funds available to students who wanted to further their education (Nelson, 2014). In the 1970s, a number of for-profit institutions were identified by the government as "diploma mills" that were not accredited and did not provide education, but instead awarded degrees based on self-reported student experience. The FBI worked to eliminate these institutions in the 1980s, and the for-profit educational institution sector did not begin to grow again until the 2000s. The for-profit educational industry now accounts for approximately 25% of the country's educational institutions (Hodgman, 2014; Lindgrensavage, 2016; Sipley, 2011).

Attrition

Many institutions are now under scrutiny based on graduation rates for their students. According to Ginder and Kelley-Reid (2013), the graduation rates for four-year institutions for cohort years 2006 and 2009 were 54.8% for public institutions, 64.6% for private non-profit institutions, and 33.6% for for-profit institutions. However, for two-year institutions, the graduation rates were 21.2% for public institutions, 62.3% for private non-profits, and 63.0% for for-profit institutions. An ongoing focus has been placed on attrition from higher education institutions by the government and public. College students are borrowing more in student loans, and those who drop out of college before attaining their degrees are employed at lower rates, at lower incomes, and are more likely to default on student loan payments than those who have completed their education (Jobe & Lenio, 2014). According to Jobe and Lenio (2014), researchers have focused their studies primarily on different demographics of students in order to determine what barriers those specific students may be facing in order to suggest interventions that institutions may try with those groups of students in order to increase retention and graduation rates. However, the students that are served in public, private non-profit, and for-profit institutions vary so there is not a "one-size-fits-all" approach that may fit all types of institutions and the populations that they serve.

Regulation

According to the U.S. Senate Committee on Health, Education, Labor, and Pensions, 96% of students who attend for-profit institutions take out student loans; in comparison, 13% of community college students, 48% of students at four-year public institutions, and 57% of students at private non-profit institutions use student loans to pay for their education (U.S. Senate, 2012, p. 9). Overall, the results of this investigation do not bode well for the for-profit sector, as there were many problems related to high levels of recruitment in these organizations, promises of student services that were not available once the student enrolled, higher total costs of programs when compared to comparable programs at other types of institutions, low graduation rates, and students leaving the institution (with or without degrees) with high amounts of student debt in fields where future pay may be limited. While other things were found by the committee that studied for-profits, and some for-profit institutions fared better in the report than others, the overall impact of the report was additional regulations developed by the Department of Education to control perceived ethical issues and lack of regulation in the sector in order to protect students from predatory institutions.

Gainful Employment (GE) Regulations

One of the primary results was the gainful employment (GE) regulations. These regulations were primarily put in to effect to attempt to regulate the for-profit education institutions by ensuring that: (a) a sufficient number of students are graduating from the program; (b) graduates must be making progress on paying off the debt that they incurred due to being enrolled in the program; and (c) graduates must be able to obtain employment that pertains to their degree field, and their salaries must be at a level such that they will be able to pay off their educational debts according to the debt agreements (Hentschke & Parry, 2015; Nelson, 2014). These regulations apply to education offered by for-profit institutions, as well as certificate and vocational programs at non-profit institutions. Legal appeals to the regulations in 2012 caused some of the GE regulations to be rolled back, and not all three of the original parts of the regulations were implemented (Hentschke & Parry, 2015; Nelson, 2014). However, student loan cohort default rates is one area of the original regulations that apply and are being tracked by the U.S. Department of Education to determine if institutions should

continue to be eligible for federal financial aid. The three-year federal student loan cohort default rate for students who entered repayment between 2012 and 2013 were as follows (US DOE, 2016b):

- Public institution cohort default rates dropped from 11.7% (fiscal year [FY] 2012) to 11.3% (FY 2013).
- Private institution cohort default rates rose from 6.8% (FY 2012) to 7.0% (FY 2013).
- For-profit institution cohort default rates dropped from 15.8% (FY 2012) to 15.0% (FY 2013).

Institutions who have 30+% cohort default rates for three consecutive years, or 40+% cohort default rates for the most recent year, or both, are in danger of losing their eligibility for federal student aid. In September 2016, ten institutions received sanctions including nine for-profit institutions and one private non-profit institution.

90/10 Rule

Another rule that applies primarily to for-profit institutions is the 90/10 rule (Hentschke & Parry, 2015; Morse, 2015; Nelson, 2014). This rule states that for its programs to remain eligible for students to receive federal financial aid, an institution must secure at least 10% of its revenue from funding sources other than Title IV funding (direct from students, bank loans, etc.). This is generally not an issue for public and private institutions, as they generally have state funding, alumni donations, research income, and endowments to assist them in meeting this ratio. However, for-profit institutions generally do not have these other types of funding.

According to Hentschke and Parry (2015), the main concern for-profit institution administrators was that the combination of parts of the GE regulations and the 90/10 rule worked in opposition of each other, and that it may be difficult for institutions to find a balance between the two. These authors conducted a qualitative study to analyze administrator reactions to the GE regulations, and found that many were unsure about what exactly the government was looking for and they decided that they would wait to see what direction the regulations took and what data would be requested from the institution before doing too much planning. Those administrators who were looking at what could be done to help the institution comply with the regulations were looking at the possibility of things like limited financial aid, adding scholarships, and cost reductions, as well as looking at their admission practices in order to potentially raise the quality of the students being admitted to the institution, providing additional support to students who were admitted, and also looking at more direct job-related skills in coursework in order to potentially increase graduation rates as well as increase the probability that graduates would be hired.

Accreditation

One of the ways that higher education attempts to monitor quality in institutions that offer programs to students is through the use of regional and specialized accreditation (Eaton, 2012). According to Lindgrensavage (2016), accreditation is used to ensure that the programs offered are of quality, controlling access to funding from state and federal agencies, ensuring consistency in credentials earned, and ensuring that credits can be transferred between institutions. To be eligible to receive Title IV funding from the federal government, an institution must be accredited by one of the government-approved accreditors approved by the Secretary of Education (Lindgrensavage, 2016; US DOE, 2016a). The role of accreditors is to:

- Assess the quality of academic programs at institutions of higher education.
- Create a culture of continuous improvement of academic quality at colleges and universities and stimulate a general raising of standards among educational institutions.

- Involve faculty and staff comprehensively in institutional evaluation and planning.
- Establish criteria for professional certification and licensure and for upgrading courses offering such preparation. (US DOE, 2016a, para. 8)

While the specific criteria that the accrediting body would look at when reviewing the institution may vary from accreditor to accreditor, no matter the type of institution, it is held to the same standards by the accrediting body. This means, in theory, that public, private, and for-profit institutions that receive accreditation from a government-approved accrediting body will all offer at least the same minimal level of quality in their educational programs and practices as other institutions with the same accreditation. Unfortunately, the practices of accrediting bodies have been brought into question due to the fact that the institutions themselves are members of the accrediting bodies, and employees of those institutions work for the accreditors as peer reviewers of other institutions (Bollag, 2006). It should be noted that not all institutions choose to obtain accreditation and become Title IV eligible (Riegg Cellini & Goldin, 2014). According to Riegg Cellini and Goldin (2014) some of the reasons that institutions decide not to participate in the accreditation process include that the cost to the institution may be deemed too high, that there would not be enough of a financial benefit to the institution, or that the program(s) would not qualify for accreditation.

Regional accreditation is an expensive and time-consuming process, and accreditors were recently criticized as their policies allowed for-profit organizations/investors to purchase struggling accredited institutions and subsume their regional accreditation status under the larger organization (Sladek, 2014). This basically allowed the larger organization to become regionally accredited without the entire organization being evaluated by the accrediting agency. Because of the response by the higher education community and government, the Higher Learning Commission (HLC), a regional accrediting body in the Midwest, began to closely scrutinize proposed purchases of accredited institutions by for-profit organizations and investors (Sladek, 2014). The result is that it is much more difficult for these types of purchases to be made.

Summary

Higher education continues to change and evolve as there are changes in technology, marketization, and globalization. Unmet needs of students have caused developments in the public, private nonprofit, and for-profit education sectors, as well as the technology that they use. In addition, as the sectors grow and change, there have also been changes to public and employer perceptions of higher education, as well as changes in the levels of scrutiny by accreditors and the government. Higher education is not a static entity, and will continue to change and develop as additional issues are identified and problems are solved.

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36

DISTANCE EDUCATION AND TRAINING IN THE CORPORATE SECTOR

Saul Carliner

Education and training activities in the corporate sector generally refers to efforts by employers to prepare workers for their jobs. All employers engage in these efforts, whether they are for-profit corporations, government agencies, or non-profit and non-governmental organizations.

Common activities include (Carliner, 2012):

- Helping workers perform the basic tasks of their jobs, preparing coffee at Starbucks, processing unemployment claims in a state benefits office, testing software at Microsoft, conducting a performance evaluation in a federal agency, and selling pharmaceuticals. Such training usually includes instruction on the most relevant policies and processes followed, and introductions to key products and services.
- Orienting workers to the culture of the employer, including its mission and vision, history, key people and places, and benefits and advantages of working for the employer.
- Helping workers perform their jobs more effectively and efficiently, such as providing tricks and tips for performing processes more efficiently, and frameworks of thinking about how to approach complex tasks for which no formal process exists (like troubleshooting problems).
- Preparing workers to expand the scope of work they can perform, either by cross-training workers for other roles in their work team or by adding to the skills that a worker can employ in a current position.
- Preparing workers for major changes in work processes, the introduction of new products and technologies, and mergers and reorganizations.
- Preparing workers for their next jobs by providing workers with the conceptual overview of those jobs, as well as developing the skills needed for those jobs.

Employers develop these skills in a variety of ways. One is structured on-the-job training (Jacobs, 2003), in which workers develop these skills on their own under the guidance of another worker and, usually, some formal instructional materials. Another is informally, with the assistance of colleagues and on-the-job resource materials (Cross, 2011; Eraut, 2004; Marsick & Watkins, 2001). The means most commonly associated with employer-provided training is formal courses.

Distance techniques play a role in all three means of delivering training in the workplace. This chapter explores the research on distance education in this sector. To establish a context for the chapter, it first provides a general background on distance learning in the corporate sector. Then it summarizes key themes in the research.

Background

The first key to studying distance education and training in the corporate sector is clarifying terminology. One pertains to the name of the sector. Although many often refer to the workplace as *corporate*, most workers do not, especially educational professionals who specialize in this sector. In the workplace, corporate refers exclusively to for-profit employers. In the United States, nearly 15.6% of workers are employed by federal, state, or local government agencies (Kiersz, 2015) and another 10% work in the non-profit sector (U.S. Bureau of Labor Statistics, 2014). Education professionals who specialize in this sector typically use the term workplace.

Furthermore, learning in the workplace only accounts for a part of job-related training. Several other sources of work-related instruction exist, but are not being considered in this chapter. These include (Carliner & Driscoll, 2018):

- Professional education, which refers to degree programs offered by universities for licensed professions, such as doctors, nurses, attorneys, accountants, engineers, and architects. The authorization that requires licenses for professions also provides the profession with an exclusive right to control all education for the profession. Professions usually control this education by permitting certain institutions to offer degrees in the field and requiring that their programs go through period reviews and approvals (called accrediting).
- Continuing professional education, which is controlled by the profession, too. A broader range of providers beyond universities can offer this education, but it usually happens outside of the scope of the employer. For example, if an accountant works for an aircraft manufacturer, the accountant would receive continuing professional education in accounting from a group approved by the accounting profession. Such programs are usually covered under discussions of continuing education and higher education, or in specialist literature on the pedagogy of a particular profession, such as engineering education, business education, and medical education.

Note that many unlicensed professions try to mimic the structure of licensed professions, including project management, computer specialties, and training and development. Such programs are usually covered under discussions of continuing education and adult education.

- Continuing education programs offered by universities. In many instances, employers contract with continuing education units to provide training in the workplace. In those instances, the training is considered to be offered by the employer. When workers enroll in these programs individually through the institution, they are considered outside of the scope of workplace learning, although such programs are usually eligible for tuition reimbursement by those employers who reimburse workers for tuition to work-related programs (Carliner & Savard, 2013). Such programs are usually covered under discussions of continuing education and adult education.
- Job training programs, such as programs offered by community colleges and vocational and technical centers. In many instances, employers underwrite the costs of such programs or provide other material support. But the learners are rarely employed at the time they go through such programs, and therefore, these programs are considered to be outside of the scope of workplace learning because these programs are offered to people who are not yet employed by the organization. Such programs are usually covered under discussions of workforce development and adult and vocational education.

Another distinction in terminology has to do with the name of the task of providing learning in the workplace. The name most commonly associated with the work is training or training and development (Carliner & Price, 2015). Although this "brand name" is the one that is most widely

recognized outside of the field, training professionals do not like the name and have made repeated attempts to rebrand over the past half century. Alternative terms include human resource development introduced in the late 1960s (Jamieson, 1982; Nadler, 1974), human performance technology (Reiser & Dempsey, 2012) introduced in the early 1980s, workplace learning and performance introduced in the early 2000s, learning and development introduced in the early 2000s, and talent development introduced in the 2010s (Carliner & Price, 2015). Although each of these terms has its own unique definition and each is intended to express a differentiation with training, on a practical level, the primary activity to which all refer is training. All of these terms are in use, along with training and development.

Furthermore, the packaging of instructional programs for the workplace substantially differs from their packaging in other contexts. In schools and universities, courses are part of a formal curriculum leading to a degree or diploma. They typically have several sessions over an extended period, such as daily for a school year or once a week for a semester. These courses also involve pre-class preparation, tests, and similar assessments to determine whether learners mastered the material, and grades to record the extent of student performance. Most workplace learning programs are short (as short as 15 minutes) and packaged to be taken either at a single sitting or over a period of days. Many workplace learning programs do not include a formal assessment (Arthur, Bennett, Edens, & Bell, 2003) because of previous litigation that requires that assessments used to make hiring and promotion decisions be validated for cultural bias to ensure that all workers have an opportunity to demonstrate their worthiness for a position (Huff, 1974). In other words, the concept of a course in the workplace differs a bit from its conception in other contexts.

But perhaps most relevant to this chapter is the terminology around distance education in the workplace. Generally, the term is not used at all, and a search on the term would yield few results. When researching the phenomenon in the workplace, researchers typically use the terms e-*learning*, *online learning*, *technology-delivered learning*, and *technology-enabled learning* (Ho, Jones, Julien, & Body, 2016). Although I use distance education in this chapter, recognize that, in this sector, that the term is not widely used in practice.

Forms and Extent of Digital Learning in the Workplace

In the workplace, digital or technology-delivered learning accounts for 41% of all employer-sponsored training (Ho et al., 2016). It is offered synchronously (15.27% of all workplace learning, about two-thirds of which is through online virtual classrooms and the rest by separate video systems) and asynchronously (27.4% of all workplace learning, about two-thirds of which is delivered through the Internet, one-sixth delivered by fixed media like DVDs and the remaining delivered in print). After a quick rise in adoption in the early to mid-2000s, adoption has leveled off in recent years. The ATD State of the Industry Report tracked the roles of various media in the total portfolio of training and showed a steady increase in the role of technology-based training between 2002 and 2009, reaching 36% of all workplace learning in 2009. Since then, the total percentage of workplace learning has fluctuated, going as low as 29% in 2011 and as high as 41% of all workplace learning in 2015 and 2016 (Ho et al., 2016).

Research provides insights into the reasons for this quick, and strong adoption of technology-delivered learning. For example, Bello, Bhatti, Pangil, and Battour (2015) found that cost, the increasingly widespread availability of computers, the technology infrastructure to efficiently deliver programs, and upper management support for doing so all contributed to adoption of e-learning. Although they studied adoption in a developing world, the same reasons have been offered for adoption of e-learning in developed countries like the United States and Canada (Rosenberg & Foshay, 2002). In fact, per-employee spending figures on workplace learning suggest that the larger the organization, the more likely it is to receive the benefits of technology-delivered training. Smaller

organizations, with fewer than 500 employees, spend an average of $2,122 per employee per on training, while those with 10,000 or more employees spend an average of just US$700 (Ho et al., 2016).

In the past decade, one of the technologies of learning that has received the most attention in the trade press is mobile learning. Mobile learning can refer to the mobility of the device—that is, a portable device like a laptop computer, tablet, phone, e-book reader—or to the mobility of the learner—that is, the extent to which the learner can access the materials in many places—or to the mobility of the material—that is, the ability to access the instructional material wherever the learner likes (Driscoll & Van Barneveld, 2015).

For most organizations, the primary benefit of mobile learning is the flexibility it offers, because learners can take it on a variety of devices in a variety of locations. Supporting mobile learning is cloud computing, because it makes materials available widely and because it usually offers bookmarks such that learners start a program on one device and continue it at a different time on a different device at the point where they left off. Through policies called Bring Your Own Device (BYOD), some employers encourage workers to access instructional materials on their own devices whenever the need arises. Partly because of security concerns, partly because the workers might be hourly (and eligible for compensation for learning taken after hours) or contractors (and, therefore, not employees), other employers limit their BYOD policies (Carliner & Price, 2017).

For the most part, mobile learning in the corporate context pertains to using the mobile device as a viewing platform, similar to using a desktop computer to view materials over the Web. But some organizations have sponsored programs specifically designed for small mobile devices like mobile phones and tablets, and that support performance within the context of the job (Ahmad & Orton, 2010).

When considered solely from the perspective of growth, the attention on mobile technology seems warranted. Mobile technology as a percentage of all workplace learning grew 83% between 2010 and 2016, and 24% between 2015 and 2016 alone (Ho, Jones, Julien, & Body, 2016). But mobile is not yet a significant part of workplace learning, representing only 2.72% of all workplace learning (Ho et al., 2016).

Teaching Digitally

Although employers have been using computer-based instruction to train workers since the 1970s; questions persist about its effectiveness. In the higher education sector, Bernard et al. (20045) concluded in their definitive meta-analysis in 2004 that the two are essentially equally effective. That is, online instruction is as effective as classroom instruction. But that study and similar ones focused on higher education, not the workplace. Sitzmann, Kraiger, Stewart, and Wisher's (2006) meta-analysis reached essentially the same conclusion for workplace learning. Sitzmann and her colleagues essentially concluded that computer-based instruction is more effective than the face-to-face classroom for teaching declarative knowledge, and the two are equally effective with procedural knowledge.

In more recent years, the focus has shifted away from whether digital learning in general is effective to specific approaches that work in a digital environment. At the core of recent research on digital learning in the workplace are issues associated with teaching online. Specific issues of interest to researchers are their learners, instructional techniques that work in an online setting, and the role of the traditional formal course in a digital world. The following sections explore each of these lines of research.

Online Learners

Like other branches of education, the corporate sector has a strong interest in the instructional preferences of millennials (those born between 1980 and 1996). For example, Gutierrez (2016)

commented that millennials are always online and that techniques like gamification and simulation engage these learners. However, Hoffman, Franks, and Edson (2015) define the issue not as one of techniques but as one of generational differences, requiring an awareness of the culture of the generation and addressing that, rather than a matter of teaching techniques. Much of the focus of this attention is on integrating these young workers into the workforce for their first jobs.

Receiving less attention, however, are the learning preferences and issues of older workers, especially those over the age of 50. As some workforce development specialists comment, the overwhelming majority of the workforce of 2030 is already in the workforce. Furthermore, one of the fastest-growing demographics of workers is older workers as people eschew full retirement for personal or financial reasons (Schlosser, Zinni, & Armstrong-Stassen, 2012). In terms of learning with technology, Miscio (2014) suggests that older workers could face a more challenging time learning to use technology than younger workers while Wolfson and Kraiger (2014) suggest, too, that age is a factor in instructional design for technical training, and found that younger and older learners responded differently to some instructional design devices, such as advance organizers (they aided older learners' learning more than younger learners), while other devices like instructional coherence had similar effects on both age groups.

Instructional Techniques That Work Online

Partly because of concerns about reaching millennials and partly out of fear of producing page-turners—courses that simply involve reading pages of online text or sitting through narrated slides, with minimal interaction—many designers of online learning for the workplace have expressed interest in adopting specific techniques to engage learners. The most popular are games, simulation, personalization, and social learning. What should be noted, however, is that these topics have always held interest for designers of learning for the workplace. For example, topics like personalization, games, simulations, social learning, and accessibility have received coverage in the training literature since at least as early as the 1960s.

Games, Simulations, and Gaming-Simulations

Games refer to situations in which learners have the opportunity to act and experience the consequences of their action (Greenblat, 1988). A related concept is gamification, which refers to the application of game-like approaches to engage learners (Kapp, 2012).

By contrast, a simulation is a model of the most salient features of a real-world situation. A *gaming-simulation* provides learners with the opportunity to act in a simulated environment and experience the implications of their actions (Greenblat, 1988). Most educational uses of simulations online are actually gaming-simulations.

Research has pursued three paths. The first explores the overall effectiveness of teaching with games and simulations. In their 2011 meta-analysis of teaching with games in a workplace training context, Sitzmann and Ely (2011) found that simulation games led to an 18% increase in post-training self-efficacy, 12% increase in declarative knowledge, 14% increase in procedural knowledge, and 9% increase in retention. However, they found that certain characteristics of simulation games contributed to results like these, including: using active rather than passive teaching techniques, providing learners with unlimited time to practice with the simulation-gaming activity, and supplementing other types of instruction with the simulation-game rather than the simulation-game standing on its own.

The second is the ability of simulations to reduce time to performance. That is, someone who has five months on the job can competently handle issues that typically require one year of experience because, through simulations, workers have been exposed to experiences they might not have

encountered naturally for several more months. Many of these studies are proprietary, with results only reported internally.

The other recent interest of researchers is virtual reality, which uses digital technology to provide a more immersive and realistic simulation than what might be possible through other approaches, including continuing medical education. For example, Cates, Lönn, and Gallagher (2016), who found that virtual reality training led to significantly better performance for cardiologists trained in treating vascular issues; and in safety training, such as Grabowski and Jankowski (2015) who used virtual reality training for new miners and found that the program received wide acceptance by learners (no performance statistics provided). This research occurs at a time when the cost of virtual reality is significantly dropping as new equipment and software for creating and experiencing virtual reality hits the market (Bevione, 2017).

Personalization

Personalization involves the tailoring of pedagogy, content, and the learning environment to meet learners' needs and learning environments by learners for learners to meet their different learning needs and aspirations. (Carliner & Driscoll, unpublished manuscript). In terms of personalization, interests focus on two specific areas. One is true personalization, which involves presenting materials to the learners that relate to their interests. cMOOCs—which Bates (2014, Oct 13) defines as:

> a networked approach to learning based on autonomous learners connecting with each other across open and connected social media and sharing knowledge through their own personal contributions. There is no pre-set curriculum and no formal teacher-student relationship, either for delivery of content or for learner support. Participants learn from the contributions of others, from the meta-level knowledge generated through the community, and from self-reflection on their own contributions.

The other is adaptive learning, "an educational method which uses computers as interactive teaching devices, and to orchestrate the allocation of human and mediated resources according to the unique needs of each learner" (Wikipedia, n.d.). Because of the costs and lead time involved in developing adaptive learning, although interest exists in adaptive learning within workplace learning, the costs are prohibitive except in certain situations, such as military training.

Social learning

Social learning applies a traditional concept of adult learning called *popular learning* (Dahl, 2016) in which it is assumed that each adult has knowledge they can share with others and from which others benefit. The concept gained new relevance with the rise of social media, which makes sharing easy, and many workplace learning specialists sought ways to leverage social media for learning (Bingham & Conner, 2015; Bozarth, 2010), much as their counterparts in communications had found ways to leverage it for marketing, employee communication, and similar uses. One application of social learning in the workplace include user-generated and subject matter expert (SME)-generated content (Gentle, 2012), through which people who have expertise with a particular type of material share application tips that can help others transfer their learning to the workplace. Another application of social media is discussion forums, an application of the Communities of Practice framework (Wenger, McDermott, & Snyder, 2002), through which people who share a professional interest can learn from one another. Twitter chats let communities of practice interact through the microblogging platform, Twitter. For example, the #lrnchat group meets every Thursday online; a group

leader proposes a topic to discuss, which participants do through 280-character messages (though the character limit was 140 characters when this chapter was written).

Accessibility

Accessibility refers to the ability of people with disabilities to easily use instructional materials. It usually involves efforts to ensure that persons with visual, auditory, and movement disabilities can participate in courses. Section 508 of the Americans with Disabilities Act provides the legislative directive in the United States, and provides guidance to people in other jurisdictions.

The Role of Learning Online

As noted earlier, online learning is offered both synchronously and asynchronously in the workplace. Although synchronous learning represents 42% of all workplace learning (Ho, Jones, Julien, & Body, 2016), nearly all of the research has focused on asynchronous learning.

Because asynchronous online learning is available on demand at any time, many workplace learning specialists have proposed that instruction is shifting from single formal events to anywhere, anytime learning (such as Rosenberg, 2002, 2007). Porcello and Hsi (2013) add that digital learning can occur by curating a variety of digital resources from large repositories of information, open data, and videos. Jarche (Institute for Performance and Learning, 2016) takes an even more extreme approach, suggesting that the appropriate training is ABC: anything but courses.

Some economic data suggests that overall, as organizations have increased their reliance on digital learning, they have reduced their investments in workplace learning. Canada shows one of the most pronounced drops, from CDN$842 in 2006 down to CDN$648 in 2010, and only bouncing back to CDN$889 in 2017 (Cotsman & Hall, 2018). Although not as pronounced, the United States has reduced its investments in training. After adjusting for inflation, overall spending on training in the United States remained flat between 1986 and 2008, even though the workforce grew by 31% (Carliner & Bakir, 2010).

Massive open online courses (MOOCs) provide one means of picking up this slack. Although designed for higher education and originally intended to be used as lower-cost alternative to courses for academic credit, because few universities agreed to recognize credits earned in MOOCs for degree programs despite joining consortia to offer these courses, the major providers of MOOCs—Coursera and edX—shifted their attention to the corporate sector (Hill, 2016, 2017). They reduced the length of courses and packaged several courses together as certificates or mini-master's (also known as *alternate credentials* because they provide an alternative to more familiar educational credentials such as degrees and continuing education units [CEUs]). Many of the packages offered by Coursera include a capstone that involves an application project. For a nominal fee, these MOOC providers offer validation that learners have successfully completed the package of courses so learners can list the programs on their résumés and qualify for jobs requiring the skills and knowledge taught. With employers increasingly focused on training immediately on the job, MOOCs have the potential to meet longer-term development needs. Some employers like Microsoft are actively collaborating with MOOC providers to offer the programs to their workers.

For the training that employers continue to offer, however, the training community is seriously promoting alternatives to the traditional course. The community has promoted three broad approaches. One is blended learning. Like its counterpart in other educational sectors, blended learning involves combining two or more media to create a comprehensive learning experience. One of the more common approaches is to combine classroom and self-study education. An

extremely basic implementation would involve requiring that student take an online course that covers either prerequisite material or conceptual material, pass a test, then attend a classroom version that builds on that material (Lewis & Orton, 2006). IBM's Sales and Management Schools use a more complex model. Its management school, which replaces a 40-hour classroom course that managers were required to attend within one month of assuming their first management position, involves a six-month asynchronous online course that begins immediately upon appointment. Managers are assigned to cohorts and work together asynchronously with their online colleagues to complete modules. The second-line manager is kept apprised of the progress of the new first-line manager. After completing the last online course with their cohort, the new manager attends a classroom course that builds on the online one (IBS Center for Management Research, 2003). The majority of those evaluations reported in the peer-reviewed and gray-market research are generally successful.

But for many, such lengthy courses are the problem, and they are looking for briefer learning experiences. A popular response has been microlearning, which consists of learning in small units—between 30 seconds and 20 minutes. Microlearning is an adaptation of the concept of spaced reinforcement. Thalheimer (2017) notes that organizations use microlearning to replace longer courses, augment other courses (either with special in-course activities, or as follow-ups), provide support for retrieving new knowledge and skills after training, offer just-in-time learning, and provide nudges or prompts to workers.

Some consultants in workplace learning question the need for any formal learning, claiming that, at best, only 10% of learning occurs formally. The claim that another 20% occurs through coaching and mentoring and the remaining 70% occurs on the job (Wroten, 2014), either through work-related experience or by consulting the digital materials mentioned earlier. As a result, organizations should simply focus on harnessing the informal learning that occurs naturally in organizations (Cross, 2011). These consultants claim the formula emerges from the research of the Center for Creative Leadership which, in turn, is based on the research of Allen Tough (such as his 2002 "Iceberg of Informal Adult Learning"). Most notably, these consultants market this concept as "70:20:10."

De Bruyckere, Kirschner, and Hulshof (2015) label 70:20:10 as an "urban myth" of education. Very little of the actual research on informal learning in the workplace specifically focused on digital media but, rather, broader processes. Marsick (2009), who has been studying informal learning for over a quarter of a century, concluded that formal and informal learning are interrelated. Eraut, who has studied informal learning at different stages of the career, notes that the role of informal learning adapts to the needs of the situation (2004), but concluded that formal learning is probably most effective and efficient for explicit concepts and informal learning is most appropriate for tacit learning (Eraut, 2004, 2008). More recent research by the Conference Board of Canada raises questions about the extent of informal learning work-related learning, finding that 45% of workers spent less than one hour a week of in learning and another 24% spending just 1–2 hours a week. These are comparable to the amounts of time most workers spend in formal learning—about 33.5 hours per year (Ho, Jones, Julien, & Body, 2016).

In addition to focusing on the role of learning online as part of a complete effort to develop workers, research has focused on the cultures of organizations that support learning in the workplace and ensure its success. Called a learning culture, it is a "set of organizational values, conventions, processes, and practices that encourage individuals—and the organization as a whole—to increase knowledge, competence, and performance" (Oracle Corporation, 2013). The Conference Board of Canada has operationalized the concept, identifying five constructs that contribute to overall learning culture: vision (extent to which the organization sees learning as central to its success), knowledge management ("systems and structures organizations have in place to ensure that important

knowledge is collected, collated, stored, and made available to those who need it"), organizational and learning culture (how the overall organizational culture supports learning), and learning dynamics ("actionable items that indicate the organization's capacity to challenge employees to think and act with a comprehensive, systematic approach, and to look at root causes, patterns, and interdependencies when solving problems and making decisions"), (Conference Board of Canada, n.d.). The board's research has determined that organizations which have a stronger learning culture have a significantly higher level of overall effectiveness. This cultural support is especially important for digital learning, especially in informal form, because other research has found that workers do not always feel supported in learning on the job and sometimes feel like they are wasting work time learning on the job, even if they cannot perform the task without making the effort (Conference Board of Canada, n.d.).

Evaluation

In addition to exploring ways to teach and present instructional materials online, trainers have explored ways to evaluate learning. Within the field of training, the Katzell-Kirkpatrick framework (Thalheimer, 2018) is the best-known framework for evaluating learning. It suggests that instruction can be evaluated on four levels:

1. **Reaction:** That is, how learners felt about the program.
2. **Learning:** That is, how learners performed on a criterion-referenced test offered immediately after the instructional event.
3. **Behavior:** That is, the extent to which the skills and knowledge mastered in the program have transferred into everyday use in the workplace after a period of time has elapsed.
4. **Impact:** That is, the benefit received by the organization that sponsored the program if learners have changed their on-the-job behaviors.

Although well-known among professional trainers, most organizations do not perform most of these types of evaluation, and the online environment poses additional challenges. Previous research suggests that only Level 1 evaluation is widely performed (Arthur et al., 2003); fewer than 40% of all programs are evaluated at level 2, and fewer than 10% evaluated at levels 3 and 4. Furthermore, response rates for level 1 evaluations of e-learning programs are significantly lower than those for classroom course (Sitzmann, Brown, Casper, Ely, & Zimmerman, 2008).

Because existing approaches are not widely used and because online systems track online behavior, digital learning has promoted an interest in alternative approaches to evaluation. One alternate approach is badging, which provides users with recognition for certain activities, such as completing a group of courses, contributing to an online community, mentoring others, and so forth. Users can post their badges in e-portfolios and on social media sites (Gibson, Ostashewski, Flintoff, Grant, & Knight, 2015). Some badges are proprietary, and their meaning is primarily limited to one organization; others are intended for recognition industry-wide. Research suggests that these badges could provide recognition of learning and skills, provided that a system of widespread recognition emerges (Finkelstein, Knight, & Manning, 2013).

Other efforts at evaluation are intended to facilitate the recognition of competence. The Experience Application Programming Interface (API), also known as Tin Can, is intended to track users' behavior and recognize completion of courses and demonstration of competence in particular areas through records kept in a Learning Record Store. In many ways, the Experience API is like digital badges (Poeppelman, Hruska, Long, & Amburn, 2015). Both recognize learning and competence, and both are intended to be transportable to other employers. The primary difference is that workers

must explicitly seek out a badge; when it is working optimally, the Experience API can recognize competence by a user's online behavior, without the worker formally requesting recognition.

Note: Since the discovery by Will Thalheimer that Raymond Katzell, not Donald Kirkpatrick, originated the four-level framework, the framework that was previously called the Kirkpatrick framework or model is now called the Katzell-Kirkpatrick Model, to provide credit to its originator.

Instructional Design Processes

Although research conducted through the decades has consistently shown that instructional designers take shortcuts in the instructional design process and do not perform activities to their fullest extent—especially in analysis and evaluation (York & Ertmer, 2011)—workplace learning professionals expressed increasing strong frustration with traditional waterfall (sequential) approaches to instructional design like the analysis, design, development, implementation, and evaluation (ADDIE) process because they are believed to unnecessarily prolong development cycles (Allen, 2012). Because of the speed with which materials can be published online, these processes seem increasingly prolonged.

So, researchers have sought to offer alternatives to address these concerns. Generating the most interest has been the Successive Approximation Model (SAM) (Allen, 2012). SAM adapts the agile methodology that has gained wide interest in the software development community. Agile refers to methodology originally devised for designing and developing software. Rather than characterizing design and development as a series of discrete activities that occur in sequence, agile approaches design and a development as a series of "sprints," during which one component of the program is designed, developed, and tested, and the lessons learned in one sprint carry forth to the next. SAM involves several brief phases in which instructional design teams develop one segment of a larger program at a time, then review and pilot test the segment, and use the feedback from that process to improve the segment and guide development of later segments of the program.

Carliner (2015) suggests that instructional designers begin projects by classifying them based on the complexity of a program and its scope of influence within the organization, and adjust the extent of work to match the nature of the project. For example, a revision to an existing program that involves adding one unit does not require a full analysis or a full design effort; it merely requires an analysis of the new material and an effort to ensure that the new material integrates seamlessly with the original material.

But perhaps most common is template-based learning, in which instructional designers develop materials to confirm to existing forms or "templates." A template is a type of form used to prepare courses, and identifies formats for particular types of material (like introductions, questions, and presentation of content), standardized text (like instructions for responding to quiz questions), and visual appearance (such as the type fonts and sizes used, location of corporate logos, and layout of screens). Templates speed development by leveraging previous design work, minimizing programming, and promoting consistency within and among programs (Jack, 2008).

Although much research on instructional design has focused on the process, some has also focused on the amount of time needed to produce different types of instructional materials. Consultant Bryan Chapman (2010) periodically conducts a "How long does it take?" study. He classifies different types of instructional programs as level 1 (slidecast), level 2 (text and graphics and some interaction), and Level 3 (full video and simulation). His results suggest why slidecasts—recorded narration over a PowerPoint slide show—probably dominate: they take significantly less time to produce than other types of e-learning (average of 79 hours of development for one finished hour of instruction vs. 194 for an average Level 2 program and 490 for an average Level 3 program).

Sources of Research on Distance Education in the Corporate Sector

Three key sources of research exist on distance education in the corporate sector. The first is research by private analysts, primarily for investment purposes. This type of research typically explores these issues:

- The size of a market for a particular type of technology-based product or service, such as the size of the market for learning management systems. Such research is commissioned by investment firms, so they can advise people who might be interested in investing in these companies.
- The health of particular companies in the sector, such as the health of a particular providers of course management systems. In addition to investors, such research is typically prepared for organizations who might be purchasing a system from one or more of these providers and want to determine whether the provider will be around after the purchase to provide continuing support and maintenance.

Market research is typically performed for products and services that involve six, seven, and eight-figure investments (such as learning management systems and course management systems) or entire industry segments (such as social media). They are not conducted as much for relatively inexpensive products such as authoring tools. Furthermore, such research is not in the public domain; in fact, it often costs US$1,000 or more to purchase a report.

The second type of research on distance education in the corporate sector is applied research conducted by professional and trade associations, think tanks, and trade publications. This research typically provides:

- Size of the entire training market and key segments within that market, including the total expenditures on training, the amount of training received by workers (averages usually provided in hours and dollars per year), the amount of different types of training provided such as sales, technical, and leadership development training, and the extent of training delivered by technology. The two best-known reports of this type are the *Training* magazine "Annual Industry Report" (launched in 1982 and conducted annually since) and the Association for Talent Development "State of the Industry Report" (launched in 1997 and conducted annually since). In Canada, the Conference Board publishes the bi-annual "Learning and Development Outlook" (launched in 1991 and conducted biannually since).
- Particular practices, usually around instructional design, authoring tools, and interest in particular topics. One source of such research is trade magazines such as *e-learning Industry* (published by e-learningIndustry.com), *Learning Solutions* (published by the e-learning Guild), and *Training and Training* magazine. Trade publishers usually make the reports available to readers of their publications. Another source is professional associations, such as the Association for Talent Development, and trade associations like the Conference Board. Associations usually make the research results available to members; others can purchase reports for a fee. A third source is private, membership-based organizations for corporate leaders, such as the Corporate Executive Board, and the Masie Center. Such research is usually available only to members.

The third source of research on distance education in the workplace is peer-reviewed publications, dissertations, and theses. Such research typically focuses on learning processes through distance education, and organizational and individual practices associated with distance learning. Research from students is

typically published as theses and dissertations; research from faculty and others is typically published in peer-reviewed journals.

Several types of journals typically publish research on distance education in the workplace. The most immediate are journals that focus on workplace learning, including *Advances in Developing Human Resources, European Journal of Training and Development*, *Human Resource Development Quarterly*, *Human Resource Development Review*, *Human Resource Development International*, *International Journal of Training and Development*, *Journal of Workplace Learning*, and *Performance Improvement Quarterly*. Other journals focus on management and industrial and organizational psychology, such as *Academy of Management Journal*, *Academy of Management Review*, *Human Resource Management Review*, and *Personnel Psychology*.

Some research appears in journals associated with educational technology, including the *British Journal of Educational Technology* and *Educational Technology Research and Development*. Occasionally, too, relevant research will appear in peer-reviewed publications on professional and technical communication, such as *IEEE Transactions on Professional Communication* and *Technical Communication*.

This chapter primarily reports research from the peer-reviewed literature, with some findings from professional and trade associations.

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THE LANDSCAPE OF K-12 ONLINE LEARNING

Examining What Is Known

Michael K. Barbour

The use of distance and online learning at the K-12 level is growing dramatically. However, the literature—and, in particular, the research—to support the effective design, delivery, and support of K-12 distance and online learning has not kept pace. This statement is a common phrase used by scholars in the field as they lament the state of research into K-12 distance and online learning. While there is some truth to this statement, the amount of research included in the overall body of literature continues to grow. It has become an unfortunate reality within the field that this growing body of research is largely unknown to practitioners (and, in many instances, scholars themselves). The use of non-research-based literature and tools to guide practice, as well as scholars failing to build upon the existing body of research, has been generally due to a lack of knowledge of the full corpus of research available.

The purpose of this chapter is to explore the literature and, in particular, the research in the field of K-12 distance and online learning. While this exploration is not designed to be a complete or comprehensive examination of the research in the field, it should provide the reader with an overall understanding of the current state of the field and the general themes within the literature. Astute readers, particularly those who are reading this chapter as a part of the overall *Handbook*, will notice specific takeaways based on the omissions or absence of themes they have become familiar in the more generalized chapters or those chapters that focus on adult populations. Finally, while the field of K-12 distance and online learning is often referred to as K-12 online and blended learning, or K-12 distance, online, and blended learning, this chapter will focus primarily on K-12 distance and online learning, with only passing reference to K-12 blended learning.

This chapter begins with a discussion of the history and evolution of K-12 distance learning, concluding with an overview of the current state of K-12 online learning. Next, the chapter will provide a short description of how K-12 distance and online learning is classified within the literature. Finally, the chapter will provide an overview of some themes from the literature and research, using a selection of representative literature. These themes will focus on the significant body of non-research literature, the continued use of media comparison studies by scholars, and the research into the design, delivery, support, and administration of K-12 distance and online learning.

History and Evolution of K-12 Distance Learning

The reality is that distance education at the K-12 or primary and secondary level has a history that is almost as long as distance education within higher education. Since the first edition of the

Handbook of Distance Education (Moore & Anderson, 2003), readers have had the opportunity to review the history and of K-12 distance education—at least in the United States. In the absence of Tom Clark's chapter in this edition of the *Handbook of Distance Education*, this chapter begins with a brief description of the history and evolution of K-12 distance learning. For a more detailed description of the history of K-12 distance and online learning in the United States, please consult Clark (2003, 2007, 2013).

The first documented use of K-12 distance learning in the United States was the use of instructional film around 1910 (Saettler, 2004). This initial distance medium was followed by the use of correspondence education in a program in Nebraska around 1923 (Broady, Platt, & Bell, 1931), and the use of educational radio through the Ohio School of the Air in 1921 (Saettler, 2004). While some educational radio programs continued to serve K-12 distance education students for some time, such as the Wisconsin School of the Air (Bianchi, 2002), as technology evolved, so did the medium for K-12 distance education. For example, Bramble (1988) described the use of an educational telephone system as the basis for the Learn Alaska Network. During the 1930s, there were several instances of educational television programming (Kurtz, 1959), although according to Clark (2000), it was rare for programs using this medium to offer full courses. In the 1960s, the use of educational satellites emerged as another generation of technology used for the delivery of K-12 distance learning (Jajkowski, 2004), which was used by programs in a variety of states to serve primarily rural areas (Howley & Harmon, 2000; Kirby, 1998; Pease & Tinsley, 1986). Beginning in the 1980s, audiographics or telematics networks began to be developed by several states, such as Iowa, Maine, and Utah (Hezel Associates, 1998).

K-12 online learning is a more recent phenomenon. In the United States, the first K-12 online learning program was developed by the private school Laurel Springs School, which began its online program around 1991 (Barbour, 2011a). Berge and Collins (1998) described how many K-12 distance learning programs, as well as some traditional face-to-face schools, were using various Internet tools to provide aspects of online classes. One of these earlier programs that experimented with these online tools was the Utah Electronic High School, although the majority of the Electronic High School's offerings were still delivered in a correspondence model (Clark, 2003). The first full-time cyber charter school, Choice 2000 in California, was established around 1994 (Darrow, 2010). The first entirely online supplemental[1] virtual schools were the Virtual High School Global Consortium (VHS) and the Florida Virtual School (FLVS), both created in 1997 (Friend & Johnston, 2005; Pape, Adams, & Ribeiro, 2005). Three years later, Clark (2000) reported that there were three existing statewide virtual schools (i.e., Florida, New Mexico, and Utah), and three more in the planning stages (i.e., Illinois, Kentucky, and Michigan). The following year, Clark (2001) indicated there were at least 14 states with existing or planned virtual schools. The growth in students participating in K-12 online learning has increased in a similar fashion. Clark (2001) estimated that there were approximately 40,000–50,000 students—representing less than 0.001% of the K-12 student population—enrolled in one or more K-12 online learning courses during the 2000–2001 school year. Ten years later, Watson, Murin, Vashaw, Gemin, and Rapp (2011) reported K-12 online learning activity in almost all 50 states, while Ambient Insights (2011) indicated that there were now approximately 4 million students—representing approximately 6% of the K-12 student population—enrolled in K-12 online learning courses during the 2010–2011 school year. K-12 online learning activity for the 2016–2017 school year range from conservative estimates of 2 million students to generous estimates of 8 million students.

Jurisdictions outside of the United States have seen similar patterns of development and growth. Barbour (2018) outlined how the K-12 distance learning technologies evolved from correspondence-based education to educational radio to instructional television to audiographic systems to online learning in countries such as Australia, Canada, and New Zealand. In fact, Barbour argued that the evolution of K-12 distance education is one of the familiar narratives in the United States that is mirrored in many international contexts. In terms of growth, in the first national examination

of K-12 online learning in Canada—as an example, the Canadian Teachers Federation (2000) estimated there were approximately 25,000 K-12 students—representing approximately 0.005% of the K-12 student population—enrolled in one or more online courses during the 1999–2000 school year. Just over 15 years later, Barbour and LaBonte (2017) indicated that there were approximately 277,603 students—representing approximately 5.4% of the K-12 student population—enrolled in one or more distance education courses[2] during the 2016–2017 school year. These figures were proportionally on par with the American estimates provided earlier.

Classifying K-12 Online Learning

Historically in the United States, there have been clear and specific descriptors for K-12 online learning. For example, traditionally, virtual schools have been programs whereby students took one or more courses in a supplemental manner, while cyber schools were programs that had students engaged in full-time online instruction (although the recent iNACOL Online Learning Definitions Project uses the terms synonymously). Over the past two decades, there have been several classifications of K-12 online learning programs, many of which have been based on the entity responsible for the administration of the program (Clark, 2000, 2001; Watson, Winograd, & Kalmon, 2004). However, even within the United States, it is becoming more difficult to place K-12 online learning programs into specific categories.

Beginning with the 2009 edition of the *Keeping Pace with K-12 Digital Learning* report, Watson, Gemin, Ryan, and Wicks (2009) introduced a matrix of dimensions for describing K-12 online learning programs (Table 37.1).

At present, it is these dimensions that are generally used to describe K-12 online learning programs (in both the United States and internationally, according to Barbour [2018]). It should be noted that while these dimensions are also often used to describe different types of K-12 blended learning programs, there is still a great deal of uncertainty and confusion about how to both define and describe K-12 blended learning (Molnar et al., 2017).

Literature and Research Related to K-12 Online Learning

While the use of online learning at the K-12 level has been practiced for approximately two decades, the availability of literature and, in particular, published research, to inform that practice has not kept pace. For example, Barbour (2011a) reviewed 262 articles from the main distance education journals for Australia, Canada, New Zealand, and the United States from 2005 to 2009, only 24 articles

Table 37.1 Watson et al.'s (2009) dimensions for describing K-12 online learning programs

Dimension	*Variables*
Comprehensiveness reach	District; multi-district; state; multi-state; national; global
Type	District; magnet; contract; charter; private; home
Location	School; home; other
Delivery	Asynchronous; synchronous
Operational control	Local board; consortium; regional authority; university, state; independent vendor
Type of instruction	Fully online; blending online and face-to-face; fully face-to-face
Grade level	Elementary; middle school; high school
Teacher-student interaction	High; moderate; low
Student-student interaction	High; moderate; low

(or less than 10%) related to K-12 distance and online learning. However, this lack of published research is changing. Cavanaugh, Barbour, and Clark (2009) indicated that of the 226 publications included in their review of the literature, there were only 29 items were from 1997 to 2000, but there were 69 items published from 2006 to 2009.

It should be noted that much of the published literature and research that has been conducted into K-12 online learning has focused on the experience in the United States. Barbour's (2011a) review found that a little more half of the 24 articles focused on K-12 distance and online learning in the United States. More recently, Barbour (2018) reported the results of his analysis of the *Journal of Online Learning Research*, which was established in 2015 by the Association for the Advancement of Computing in Education (and managed by the leadership of the Society for Information Technology and Teacher Education's special interest group focused on K-12 online learning). While the journal claims to focus on K-12 online and blended learning worldwide (Kennedy & Archambault, 2015), Barbour's (2018) analysis found that only two of the 38 articles that had been published focused on research conducted in other countries—while one other article had a generalized, global focus and a second article was a conceptual article with no geographic focus. The remaining approximately 90% of the articles that had been published by the *Journal of Online Learning Research* focused on the United States.

At present, the former "Virtual Schools and Colleges" project (more commonly referred to as the VISCED project, which was funded by the European Commission) represents the largest international effort to explore K-12 online learning.[3] Additionally, the International Association for K-12 Online Learning (iNACOL) conducted international surveys of K-12 online and blended learning (see Barbour et al., 2011; Barbour, Hasler Waters, & Hunt, 2011; Powell & Patrick, 2006), although Barbour (2018) argued that these were based on American-defined understandings of the field. Beyond these isolated instances, much of the published literature and research has focused on the United States.

Literature on K-12 Online Learning

In their review of the open access literature, Cavanaugh et al. (2009) stated that the published literature related to K-12 online learning was primarily "based upon the personal experiences of those involved in the practice of virtual schooling" (para. 5). They further indicated this literature was largely based on the opinions and/or experiences of those involved with K-12 online learning, such as online teachers or administrators of online programs. Within this largely practitioner-focused literature, Cavanaugh et al. (2009) described it as being mainly literature about "statewide and consortium/multi-district virtual schools, the roles of teachers and administrators, the promise of virtual schooling and its initial rationale for implementation, administrative challenges, the technology utilized, and interact with students" ("Conclusions and Implications," para. 1). Although, as noted earlier, Cavanaugh et al. (2009) also indicated that the proportion of published research in the four most recent years of their analysis had substantially increased, as compared to the more general, practitioner-focused literature.

Having said that, in their book *Virtual Schools: Planning for Success*, Berge and Clark (2005) described five potential benefits of and five challenges facing to K-12 online learning.

- **Potential benefits:** higher levels of motivation, expanding educational access, providing high-quality learning opportunities, improving student outcomes and skills, allowing for educational choice, and administrative efficiency.
- **Challenges facing:** high start-up costs associated with virtual schools, access issues surrounding the digital divide, approval or accreditation of virtual schools, and student readiness issues and retention issues.

It is important to point out, as Barbour and Reeves (2009) did themselves, that the benefits listed by Berge and Clark were only potential benefits. As Barbour (2010) further underlined:

> [Barbour and Reeves] were careful to remind readers that while online learning may allow for educational improvements such as a high levels of learner motivation, high quality learning opportunities or improvement in student outcomes, it certainly did not guarantee any of these potential benefits would be realized simply by the introduction of online learning.
>
> *(p. 7)*

As the research to date has clearly shown, none of these potential benefits have been proven by empirical studies using reliable and valid methodology.

It is important for those in the field of K-12 online learning to distinguish between the published literature in the field and the literature that is actually based upon research. While there is a growing body of literature, Barbour and Reeves (2009) wrote that "there [had] been a deficit of rigorous reviews of the literature related to virtual schools" (p. 402), and that "much of the research [was] only available in unpublished Master's theses and Doctoral dissertations" (p. 403). This was similar to the conclusions draw by DiPietro, Ferdig, Black, and Preston (2008), who stated "research-based investigations into the teaching and learning process in this medium and at this level are still lacking" (p. 10). Finally, Rice (2006) was likely the most direct in her assessment of the research into K-12 online learning when she lamented that "a paucity of research exists when examining high school students enrolled in virtual schools, and the research base is smaller still when the population of students is further narrowed to the elementary grades" (p. 430). However, Cavanaugh et al. (2009) indicated:

> in many ways, this [was] indicative of the foundational descriptive work that often precedes experimentation in any scientific field. In other words, it is important to know how students in virtual school engage in their learning in this environment prior to conducting any rigorous examination of virtual schooling.
>
> *(Literature Review, para. 1)*

While this may be the case, given that K-12 online learning is now two decades old, has more than 4 million students enrolled in one or more courses, and has been adopted in the United States by the educational reform movement (Bush & Wise, 2010), shouldn't we expect there to be more evidence of the success of K-12 online learning and, in particular, the factors that ensure student success in the online environment?

There is general agreement about the themes that have been dominant in the limited amount of research conducted on K-12 online learning to date. Rice (2006) described the research into K-12 online learning as either being comparisons of student performance between those enrolled in online and face-to-face environments or examinations of the qualities and characteristics of the online learning experience; with the comparative research being the dominant of the two groups. Similarly, Cavanaugh et al. (2009) also indicated that the research into K-12 online learning fell into two categories: effectiveness and issues related to student readiness and retention. Cavanaugh and her colleagues also indicated that the majority of the research had focused on the effectiveness category.

Research on the Effectiveness of K-12 Online Learning

Given the amount of K-12 online learning research focused on comparing the student performance of students in various K-12 online learning environments to students in the traditional, brick-and-mortar classroom, it is important to critical examine this body of research. For example,

an examination of the findings related to the comparison of students in supplemental K-12 online learning environments and the traditional classroom has been mixed (Table 37.2).

However, these general findings do not tell the complete story. For example, Mulcahy and Barbour (2010) later speculated that weaker students may have been self-selecting a less rigorous curriculum in order to avoid taking online courses (a finding that was also supported by Mulcahy, Dibbon, and Norberg [2008]). This kind of skewing of the potential sample from the K-12 online learning is quite common in the studies listed earlier (Table 37.3).

This kind of student selectivity in the K-12 online learning samples should not be surprising to anyone familiar with its practice. With the exception of the past 3–5 years, the literature related to K-12 online learning has provided a fairly consistent description of K-12 online learners (Table 37.4).

Rice (2006) summarized this problem by indicating the research into the effectiveness of K-12 online learning as being "challenged with issues of small sample size, *dissimilar comparison groups*, and differences in instructor experience and training" (p. 431, emphasis added). She concluded "that the

Table 37.2 Summary of research related to the effectiveness of supplemental K-12 online learning

Study	*Finding*
Ballas and Belyk (2000)	Performance of virtual and classroom students in Alberta were similar in English and social studies courses, but that classroom students performed better overall in all other subject areas
Bigbie and McCarroll (2000)	Over half of the students who completed FLVS courses scored an A in their course and only 7% received a failing grade
Barker and Wendel (2001)	Students in the six virtual schools in three different provinces performed no worse than the students from the three conventional schools
Cavanaugh, Gillan, Bosnick, Hess, and Scott (2005)	FLVS students performed better on a non-mandatory assessment tool than students from the traditional classroom
McLeod, Hughes, Brown, Choi, and Maeda (2005)	FLVS students performed better on an assessment of algebraic understanding than their classroom counterparts
Barbour and Mulcahy (2008)	Little difference in the overall performance of students based upon delivery model
Barbour and Mulcahy (2009a)	No difference in student performance based upon method of course delivery
Chingos and Schwerdt (2014)	FLVS students perform about the same or somewhat better on state tests once their pre-high-school characteristics are taken into account.

Table 37.3 Methodological issues with the supplemental K-12 online learning samples in comparative studies

Study	*Sample*
Ballas and Belyk (2000)	Participation rate in the assessment among virtual students ranged from 65% to 75% compared to 90% to 96% for the classroom-based students
Bigbie and McCarroll (2000)	Between 25% and 50% of students had dropped out of their FLVS courses over the previous two-year period
Cavanaugh et al. (2005)	Speculated that the virtual school students who did take the assessment may have been more academically motivated and naturally higher achieving students
McLeod et al. (2005)	Results of the student performance were due to the high dropout rate in virtual school courses

Table 37.4 Description of supplemental K-12 online learner from the research

Study	*Sample*
Kozma, Zucker, and Espinoza (1998)	Vast majority of VHS students in their courses were planning to attend a four-year college
Espinoza, Dove, Zucker, and Kozma (1999)	VHS courses are predominantly designated as "honors," and students enrolled are mostly college bound
Haughey and Muirhead (1999)	Preferred characteristics include the highly motivated, self-directed, self-disciplined, independent learner who could read and write well, and who also had a strong interest in or ability with technology
Roblyer and Elbaum (2000)	Only students with a high need to control and structure their own learning may choose distance formats freely
Clark, Lewis, Oyer, and Schreiber (2002)	Illinois Virtual High School students were highly motivated, high achieving, self-directed and/or who liked to work independently
Mills (2003)	Typical online student was an A or B student
Watkins (2005)	Forty-five percent of the students who participated in e-learning opportunities in Michigan were either advanced placement or academically advanced students

effectiveness of distance education appears to have more to do with who is teaching, *who is learning*, and how that learning is accomplished, and less to do with the medium" (p. 440, emphasis added). While Cavanaugh (2013) concludes that the research into the effectiveness of K-12 online learning "suggests that as distance education is currently practiced, student learning on average in well-designed online elementary and secondary environments appears to be equivalent to learning in a well-designed classroom environment" (p. 172). Essentially, it is the differences in how K-12 online learning is designed, delivered, and supported—along with the characteristics of the individual student—that account for whether the online students perform at comparable levels as traditional classroom students.

The issue of the student selectivity in the comparative studies focused on supplemental K-12 online learning is particularly true when many have indicated a growing segment of online learners who fall into the category of at-risk students (Barbour, 2009, 2011a; Klein, 2006; Rapp, Eckes, & Plurker, 2006; Watson, Gemin, & Ryan, 2008). Many students identified as at-risk students are engaged in online credit recovery, which has seen several recent studies examining the performance of students enrolled in online credit recovery situations (Table 37.5).

While each of these studies found that online credit recovery could be an effective way for at-risk students to make up courses that they had initially failed (or at least as effective as other forms of credit recovery), both Heppen et al. (2016) and Stallings et al. (2016) found that the online credit recovery actually hindered students' long-term understanding or success. These findings continue the pattern that it is often *who* is learning online or *how* that online learning is designed, delivered, and/or supported that account for whether the online learning is as effective as face-to-face instruction.

While this discussion thus far has focused on the effectiveness (or lack thereof) of supplemental forms of K-12 online learning, it is interesting to note that full-time forms of K-12 online learning have been found to be even less effective compared to face-to-face instruction. Over the past five years, the National Education Policy Center—through their annual *Virtual Schools in the US* reports—have documented how full-time K-12 online learning have underperformed brick-and-mortar or traditional face-to-face schools on a consistent basis (Miron & Gulosino, 2016; Molnar et al., 2013, 2014, 2015, 2017). These annual findings have been consistent with the existing research into the effectiveness of full-time K-12 online learning—regardless if that research has come from

Table 37.5 Research into student performance in online credit recovery

Study	*Finding*
Hughes, Zhou, and Petscher (2015)	• Likelihood of a student earning a grade of C or better was higher when a course was taken online than when taken face to face
Heppen et al. (2016)	• Students stated online course more difficult and had more negative attitudes about mathematics • Online students had lower algebra assessment scores, grades, and credit recovery rates • Long-term outcomes were not significantly different
Stevens, Frazelle, Bisht, and Hamilton (2016)	• Fewer than 60% of online students received passing grade • Online students had lower passing rates than those who take multiple courses in a semester
Stallings et al. (2016)	• Little difference between success rates of online credit recovery and other credit recovery options • Online students who did not subsequently drop out were more likely than other credit recovery students to graduate on time

empirical studies, think tanks or policy centers, investigative journalists, or legislative audits. Even the National Alliance for Public Charter Schools (2016), an advocacy organization that supports school choice initiatives, concluded that full-time online charters and the students that attend them perform worse than traditional public schools.

Examining K-12 Online Learning Teacher Roles

Another area of K-12 online learning that scholars have agreed upon is the fact that the growth of K-12 online learning has resulted in changes to the traditional role of the teacher. In a traditional classroom environment, the teacher is responsible for designing the instructional activities that get employed with the students, presenting the content or actually teaching the material, and helping to facilitate students while they are completing any independent work. However, in an online environment, it is often the case that different individuals perform each of these tasks. The "Teacher Education Goes Into Virtual Schooling" (TEGIVS) project introduced these diffused roles in the K-12 online learning environment as: virtual school designer, virtual school teacher, and virtual school site facilitator (Davis, 2007). In a special issue of the *Journal of Technology and Teacher Education* devoted to K-12 online learning, Ferdig, Cavanaugh, DiPietro, Black and Dawson (2009) further delineated the different roles that teachers might undertake in the K-12 online learning environment into eight separate responsibilities. The Davis (2007) and Ferdig et al. (2009) K-12 online learning teacher roles are described, and compared, in Table 37.6.

While the Ferdig et al. (2009) classification is the more developed, within the literature the Davis (2007) has become the more commonly used. For the purposes of this chapter, the following sub-sections will explore the literature related to K-12 online learning through the lens of the virtual school designer, the virtual school teacher, the virtual school designer, and the virtual school administrator.

Research Into the Design of K-12 Online Learning

There are still only a handful of studies that have examined the design and delivery of virtual schooling, most with methodological limitations. For example, Barbour (2005, 2007) first proposed ten—and

Table 37.6 Teacher roles in online learning environments

Davis' roles	*Davis' responsibilities*	*Ferdig et al.'s roles*	*Ferdig et al.' responsibilities*
Designer	Designs instructional materials. Works in team with teachers and a virtual school to construct the online course, etc.	**Instructional Designer**	The creator of the online course in accordance with content standards using effective strategies for the learners and the content.
Teacher	Presents activities, manages pacing, rigor, etc. Interacts with students and their facilitators. Undertakes assessment, grading, etc.	**Teacher**	The educator with primary responsibility for student instruction within an online course including interaction with students and assigning course grades.
		Online Facilitator	The person who supports students in a virtual school program. The facilitator may interact with students online or may facilitate at the physical site where students access their online courses.
Facilitator	Acts as local mentor and advocate for students(s). Proctors and records grades, etc.	**Local Key Contact**	The professional who assists students in registering and otherwise accessing virtual courses.
		Mentor	The academic tutor or course assistant for students.
		Technology Coordinator	The person who facilitates technical support for educators and students.
		Guidance Counselor	The academic advisor for students.
		Administrator	The instructional leader of the virtual school.

later seven—principles of effective online course design for adolescent learners (such as those found in K-12 online learning environments). These principles were developed based on interviews with six course developers and teachers in a single Canadian virtual school. The researcher did not analyze any of the asynchronous course content to determine if the developers and teachers implemented any of the "principles" that they discussed. The researcher also did not interview students to gauge their opinions on whether the principles were perceived as effective by the adolescents themselves. Essentially, Barbour did not undertake any additional data collection and analysis that would have allowed him to triangulate his findings. It is also important to note the virtual school where Barbour conducted this study used a primarily synchronous form of delivery (almost unique among K-12 online learning programs in North America), where teachers and students rarely use the asynchronous course content (Barbour & Hill, 2011). Similar complaints could be made about the set of instructional design competencies defined by Rozitis (2017), which were based on a Delphi model using the perceptions of practitioners, instructional design academics, university pre-service instructors, online school administrators, and practicing instructional designers.

In a separate line of inquiry, Barbour and Cooze (Barbour & Cooze, 2004; Cooze & Barbour, 2005, 2007) examined the potential for designers of K-12 online courses to focus on specific student learning styles. The researchers concluded that students who were visual learners (traditional modalities) possessed interpersonal, bodily kinesthetic, logical-mathematical, and visual-spatial intelligences

(Gardner's multiple intelligences), or were assimilators (Kolb's theory of experiential learning), and were naturally the better online learning; and that course designers should focus on including course elements that would assist learners who did not posses these characteristics. Unfortunately, research into learning styles has been found to be quite unreliable (Coffield, Moseley, Hall, & Ecclestone, 2004), and is seen by most researchers as a form of pseudo-science (Reeves, 2008). Similarly, Keeler (2006) also focused on the influence of learning styles on online course design for secondary students.

Further, Keeler, Richter, Anderson-Inman, Horney, and Ditson (2007) discussed the principle that online learning should be accessible, and how differentiated instruction and universal design could be used to create a course for students with learning disabilities. The following year, Grabinger, Aplin, and Ponnappa-Brenner (2008) also described how universal design in online learning environments could be used to address the unique needs of students with cognitive impairments. In one of the few examples of empirical research, Keeler and Horney (2007) analyzed 22 online high school courses using the validated Instrument of Instructional Design Elements of High School Online Courses (Keeler, 2003). Their analysis found 38 design elements from five categories (accessibility, website design, technologies used, instructional methodologies, and support systems) were important in online instruction for students with disabilities (Keeler, 2004). However, their instrument was limited to description of the online course (i.e., asynchronous curricular material), and failed to account for the quality of that material.

To address these limitations, and the need to serve a wider range of students because of online learning graduation requirements, iNACOL (as the professional association representing K-12 online learning programs) conducted a review of published K-12 online course design standards that resulted in the release of the *National Standards for Quality Online Courses* (iNACOL, 2007a).[4] In the introduction to these standards, it is stated:

> In partnership with the Southern Regional Education Board (SREB), NACOL is adopting the Standards for Quality Online Courses as a primary source, with an additional rubric for inclusion of 21st century skills, with reference to the Partnership for 21st Century Skills.
>
> *(p. 2)*

The Partnership for 21st Century Skills is in reference to a report on *Virtual Schools and 21st Century Skills* that was commissioned by iNACOL and the Partnership for 21st Century Skills in 2006 (see iNACOL & Partnership for 21st Century Skills, 2006). To date, in the only research to test the validity and reliability of the iNACOL standards, Adelstein and Barbour (2016a, 2016b, 2017), found that the standards—and the associated rubric—did not meet the threshold of a reliable and valid instrument based on a review of research and literature, an expert review panel, and an application of the revised rubric using existing K-12 online courses. However, even though these standards have not been subjected to the rigorous process on multiple instances that most "national standards" undergo, jurisdictions such as the states of California, Michigan, and Texas have adopted these standards for the design of their K-12 online learning programs (Adelstein & Barbour, 2016c).

Research Into the Delivery of K-12 Online Learning

Interestingly, within the field of K-12 online learning, there has been almost universal agreement that while there are some similarities, the practice of teaching in an online environment is different and requires a different set of skills than teaching in a traditional face-to-face environment (Davis et al., 2007; Easton, 2003; Lowes, 2005; Morris, 2002; Roblyer & McKenzie, 2000). Unfortunately, the available research into the delivery of K-12 online learning has yet to fully define on what constitutes effective online teaching. In her chapter in the third edition of this *Handbook*, Cavanaugh (2013) described research into student characteristics, course design factors, teacher preparation and

development, course facilitation, and technological approaches; all have implications for the effective delivery of K-12 online learning opportunities. However, there has yet to be a volume of research into teaching in a K-12 online learning environment that has been able to define the unique set of skills for K-12 online teaching; even though this is the area of K-12 online learning that has probably seen the most published research.

One of the reasons for this lack of definition is that the research into the delivery of K-12 online learning has similar methodological limitations that were found in the research on effective design of K-12 online learning. For example, DiPietro et al. (2008) reported best practices in asynchronous teaching based upon the perceptions of online teachers at a single statewide, supplemental virtual school. These perception self-reports were not validated through observation of their teaching or through student performance in their courses. Also, the teachers who were interviewed were those that had been identified by the virtual school itself as being "good online teachers." Later, DiPietro (2010) described five beliefs of "successful" asynchronous pedagogic practices based on interviews with virtual school teachers, along with samples of course content shared by the teachers, at a single statewide supplemental virtual school. Similar to the earlier study, there was no independent verification that the beliefs of these teachers were actually acted upon in their online teaching, and students were again excluded from the data collection process. Another example of this methodologically limited line of inquiry comes from the work that Murphy and her colleagues have conducted on synchronous instruction in K-12 online learning environments (Murphy & Coffin, 2003; Murphy & Rodríguez-Manzanares, 2009a, 2009b; Murphy, Rodriguez-Manzanares & Barbour, 2011; Nippard & Murphy, 2007), while Archambault (2014) focused on the self-reported practices from a group of K-12 online teachers from a cyber charter school.

In addition to standards for online course design, iNACOL also conducted a review of published K-12 online teaching standards that resulted in the release of the *National Standards for Quality Online Teaching* (iNACOL, 2007b).[5] As with the association's other set of "national standards," there has been no research published to support the selection of the individual standards included. There has also yet to be any attempt to validate these standards using empirical research methods. Recently, authors have attempted to seek evidence from within the literature to support these national standards (e.g., Ferdig et al., 2009) or have surveyed online teachers to determine their perceptions of these national standards (e.g., Smith, 2009). However, there still has not been a systematic validation of these standards or the associated instruments to measure these standards released by iNACOL.

One of the few efforts to validate or ground the examination of in a larger theoretical or conceptual framework, McCombs and Vakili (2005) developed a learner-centered framework containing online learning practices based upon the American Psychology Association's (APA) 14 learner-centered principles (i.e., APA Work Group of the Board of Educational Affairs, 1997). In their review of the research literature related to the delivery of education using online learning, McCombs and Vakili used the APA's original four domains to propose 37 online learning practices: metacognitive and cognitive (ten practices), affective and motivational (ten practices), developmental and social (nine practices), and individual-differences factors (eight practices). However, like many of these proposed frameworks—particularly within the field of K-12 online learning—there has yet to be empirical research to validate any of these practices beyond the initial literature review.

One of the difficulties with these perception-based studies and online teaching standards and frameworks that have yet to be validated is that they do not provide guidance for initial teacher preparation and/or in-service teacher professional development. For example, both Archambault and Crippen (2009a, 2009b) and Rice and Dawley (2007, 2009) investigated the characteristics of those who are teaching online in different contexts; and each of these studies included aspects that focused on the knowledge, skills, and abilities that these teachers perceived were required for the K-12 online learning environment (Archambault, 2011; Dawley, Rice, & Hinck, 2010; Rice & Dawley, 2008). Similarly, Kennedy, Cavanaugh, and Dawson (2013) examined the perceptions of pre-service

teachers who undertook a field experience in a K-12 online learning environment. It is based on this kind of research that the limited number of programs has even engaged in the preparation of pre-service or in-service activities related to K-12 online learning. For example, Kennedy and Archambault (2012) found that that only 1.7% of responding teacher education programs in the United States offered any type of field experience in K-12 online learning environments, while a follow-up study found that number increased to 3.5% (Archambault et al., 2016). Essentially, those involved in the training of K-12 online learning professionals have little help on what should be included based on the available research. Even more unfortunate is the fact that, even without research supporting what constitutes effective K-12 online teaching, some states have begun to add online teaching endorsement to their teacher certification or licensure system (Archambault, DeBruler, & Freidhoff, 2014; McAllister & Graham, 2016).

Research Into the Support of K-12 Online Learning

Consistent with the research into the delivery of K-12 online learning, the research into effective strategies to support K-12 online learning has also grown since the last edition of the *Handbook of Distance Education*; although it also has some of the same methodologically limitations. One of the early lines of inquiry in this area was undertaken by Roblyer and her colleagues, who developed an instrument designed to predict whether an online learning student will be successful in their online course. The Educational Success Prediction Instrument (ESPRI), initially reported by Roblyer and Marshall (2002–2003), was developed to "help predict which high school students would be likely to succeed in online courses and provide a basis for counseling and support for other students interested in becoming online learners to help them become more successful" (p. 241). Roblyer and Marshall conducted a validation study of the ESPRI and found that the instrument had a reliability level of 0.92 with a sample of 135 online learning students, which included students with disabilities. In a follow-up to their initial study, Roblyer, Davis, Mills, Marshall, and Pape (2008) again found the ESPRI had a reliability level of 0.92, this time with a sample of 4,100 online learning students, which again included students with disabilities. Roblyer (2005) stated that the next step in this line of inquiry was "to develop preparation materials to help students whose ESPRI results indicate potential for problems in online learning" (para. 8). While the development of this validated instrument represented a positive step and is still one of the few validated instruments within the field of K-12 online learning, Roblyer et al. (2008) also found GPA to be as reliable a predictor of student success in the K-12 online learning environment as the ESPRI.

While there is a limited amount of research into the various roles facilitators or mentor teachers undertake, the research has indicated this individual has a critical role on students' success in online learning (Barbour & Mulcahy, 2004; Roblyer, Freeman, Stabler, & Schneidmiller, 2007). For example, Barbour and Mulcahy (2004) found that teachers at the school level provided substantial levels of support in a wide range of areas, including supervisory and administrative duties, technical troubleshooting, and providing content-based assistance. However, these findings were based on only five teachers performing this role in the first year of operation for a single Canadian virtual school. In a follow-up to that initial study, Barbour and Mulcahy (2009b) found that the amount of time these school-based teachers spent supporting the students engaged in online learning had actually increased. The authors also found that as students with a wider range of abilities are enrolling in online courses, the local school-based teachers have to spend more time monitoring students' progress and assisting the academically weaker students. Similarly, in their evaluation of a statewide virtual school, Roblyer et al. (2007) found that school-based teachers "directly working with students day by day [were] key to the success of the [K-12 online learning] program" (p. 11). However, beyond the findings in these two individual province-wide/statewide supplemental programs, there has no been additional research into the role of local teachers in supporting K-12 students engaged in online learning.

The most systematic investigation into the support for students engaged in K-12 online learning was lead by the National Center for Rural Education Support at the University of North Carolina-Chapel Hill. A team of researchers explored the impact of Web-based professional development for school-based facilitator personnel, and whether that training affected student performance and retention in the supplemental K-12 online learning environment. The online professional development focused on several issues identified as common challenges for virtual school facilitators (e.g., the first day of school, how to talk about and support online assignments, potential student fears, helping to develop time management skills, assisting with the problem of too much work, what to do when students become disengaged, how to ease students who are worried about their grades, etc.) (Irvin, Hannum, Farmer, de la Varre, & Keane, 2009). The multi-year study included students enrolled in a variety of K-12 online learning programs from multiple states. The researchers found online students that had facilitators who completed the professional development had a higher level of retention (Hannum, Irvin, Lei, & Farmer, 2008). Finally, the researchers also stated that effective facilitators should have "a good, working relationship, who were consistently responsive in their interactions with the teacher, and engaged with and interested in their students" (de la Varre, Keane, & Irvin, 2010, pp. 202–203), and facilitators should also assist the online teacher by projecting teacher presence (de la Varre, Keane, & Irvin, 2011).

In one of the few inquiries into the full-time K-12 online learning, Borup, Graham, and Davies (2013a, 2013b) explored interaction as a variable to describe the types of support students in online environments. This initial exploration led to the development of the Adolescent Community of Engagement (ACE) framework (Borup, West, Graham, & Davies, 2014), which has allowed Borup and his colleagues to examine the role of online teachers, parents (i.e., who perform the mentor or support role for students in the full-time online environment), and fellow students (Borup, 2016a, 2016b; Borup, Graham, & Drysdale, 2014; Borup & Stevens, 2016). Additional research using the ACE framework has explored support provided to both full-time and supplemental K-12 online learners (Borup & Stevens, 2017; Borup, Stevens, & Hasler Waters, 2015; Drysdale, Graham, & Borup, 2014, 2016; Freidhoff, Borup, Stimson, & DeBruler, 2015; Oviatt, Graham, Borup, & Davies, 2016). One of the unique aspects of the work by Borup and his colleagues is the fact that it is grounded in a particular conceptual framework, a trait not seen in most K-12 online learning research.

Research Into the Administration of K-12 Online Learning

Prior to the publication of the last edition of the *Handbook of Distance Education*, there was very little literature related to the administration of K-12 online learning—at least from the perspective of school leaders in the K-12 online learning environment. In fact, one of the only sources that explored the perceptions of school leaders in relation to K-12 online learning were the Sloan Consortium's reports based on surveys of U.S. school district administrators (Picciano & Seaman, 2007a, 2009). These surveys were designed explore the nature of online learning in K-12 schools based on the perceptions of school leaders, as well as their impressions of online learning planning, operational difficulties, and providers. The authors indicated that K-12 online learning might provide opportunities for small rural schools, and "that the blended model may prove to be attractive to K-12 schools, especially those that are struggling with issues of online learning quality, student readiness, and teacher professional development" (Picciano & Seaman, 2007b, p. 31). This lack of literature may explain the reason why even though Ferdig et al. (2009) had identified the virtual school administrator, this subsection was not included in this chapter in the previous edition of the *Handbook*.

Since the last edition of the *Handbook*, there have been studies into how virtual school teachers perceived school personnel practices and leadership (Beck & Maranto, 2014), the challenges faced by virtual school leaders (Richardson, LaFrance, & Beck, 2015), and the perceived differences between being a school leader in a virtual school environment compared to a brick-and-mortar environment

(Quilici & Joki, 2011; Richardson, Beck, LaFrance, & McLeod, 2016). Simply put, as McLeod and Richardson (2014) described, "there . . . are a few reports and studies that address the practices and preparation of leaders of virtual schools. These articles are insufficient, however, to paint a rich picture of virtual school leadership" (p. 290). This reality likely explains why LaFrance and Beck (2014) found that only 9% of school leadership programs provided exposure to K-12 online learning settings, and greater than 75% had no plans to provide opportunities for field experiences in online settings.

However, if the concept of the "administration of K-12 online learning" is expended to include how K-12 online learning is administered at the local, district, and state level than it opens itself up to a wider body of literature focused on issues related to the governance and policy of K-12 online learning. For example, the annual *Virtual Schools in the US* reports published by the National Education Policy Center feature a complete section that examines the legislative initiatives related to K-12 online and blended learning (Molnar et al., 2013, 2014, 2015, 2017). The Michigan Virtual Learning Research Institute has explored policies related to the initial approval and ongoing evaluation of K-12 online learning programs (Barbour, Clark, DeBruler, & Bruno, 2014), as well as undertaking case studies to examine state-level policy related to K-12 online learning (Archambault et al., 2015; Barbour, Miron, & Huerta, 2017; Clark, 2016). It should be noted that most of this literature has been descriptive in nature, and has tended to focus on full-time K-12 online learning (and in particular online or cyber charter schools).

Conclusions and Recommendations

The purpose of this chapter was to provide an overview of the state of research into K-12 distance and online learning, While not comprehensive in nature, the chapter describes many of main themes—as well as limitations—present in the research, in addition to many takeaways from the current body of literature. The first takeaway is that there is a growing body of literature and research, but the practice of K-12 distance and online learning is still outpacing both the availability and use of that research. The second takeaway is that there is still a significant body of literature that is not research based, or that is contrary to what is known based on the research, that guides practice. The third takeaway is that comparisons of student performance in the online environment vs. a face-to-face environment (i.e., media comparison studies) continue to a significant aspect of K-12 distance and online learning research. The final takeaway is that much of the published research is methodologically limited or the findings are limited to the individual program(s) where the research occurred.

At this stage of the development of the field, the continued focus of research on media comparison studies does little to further our understanding of K-12 online learning—both due to the skewed samples found in most of the online learning samples and because of the inherent difficulties in comparing student performance based solely on method of delivery without controlling for any additional factors. Beyond this body of comparative research, much of the research has been qualitative in nature (which can be quite useful for understanding K-12 online learning in a specific setting, but by definition is not generalizable to other jurisdictions). Further, a significant portion of the body of research suffers from the issue of overreaching (e.g., interviewing a group of hand-picked teachers or developers and using their opinions to generate "best practices"). These shortcomings in the current body of research provide scholars in the field with a specific path forward.

Future research in the field of K-12 distance and online learning needs to find ways to overcome these methodological limitations. For example, an astute reader of this chapter will have noticed that in describing the current body of research that there are numerous exploratory studies, but there is an almost complete absence of the use of validated instruments. In the previous edition of this *Handbook*, Saba (2013) wrote that "as needed and important as these [exploratory] studies are, their results are seldom subjected to experimental data-based research for determining the validity of newly surfaced constructs beyond their initial exploration" (p. 51). In addition to the use of validated

instruments, the use of theoretical and conceptual frameworks—such as those described in the first part of this handbook—can be used by researchers to help explain the relationships within an individual program or a specific system within that program. Again, a keen reader of this chapter would have also noticed few examples of research that was based on or that utilized theoretical or conceptual frameworks to explain relationships or guide the exploration of different variables. All of these shortcomings provide researchers with guidance for future research within the field of K-12 online and distance learning.

Notes

1. Terms such as full-time, supplemental, virtual school, and cyber school are described in the following section.
2. A significant portion of K-12 distance education in Canada is still delivered using correspondence, instructional televisions, and videoconferencing delivery models.
3. See the VISCED Project website at www.virtualschoolsandcolleges.info/ and the VISCED Project wiki at http://virtual-learning.referata.com/wiki/Main_Page
4. A second version of these standards has been released (see iNACOL, 2011a). These updated standards are supposedly based upon research conducted in the states of Texas and California; however, the standards document does not mention any specific details or findings from this research and there has yet to any formal presentation or publication of this "research."
5. iNACOL has also released an updated version of these "national standards" (see iNACOL, 2011b).

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DISTANCE EDUCATION IN LATIN AMERICA

Beatriz Fainholc

Today, distance education (DE) is well represented in Latin American countries—including Argentina, Mexico, Brazil, Colombia, Chile, and recently Uruguay—and to a lesser extent in some Caribbean countries. DE has a critical part to play, as all of these countries face structural and organizational problems for traditional students. This chapter provides an overview and analysis of the field in this region.

One of these problems is the dilemma of how to expand enrollment in basic and higher education levels, especially how to extend basic or technical education of quality through high-speed connectivity that is more prevalent in urban areas than in rural, isolated, and socially excluded areas. At the same time, factors associated with "elitism" as an effect of internationalization are more present in Latin American countries than in more developed economies (Knight, 2006), and it is recognized that DE is one of the best hopes for raising educational standards in this region where so many people cannot afford university education and lack the basic skills that are necessary to obtain admission or to find employment.

Research suggests that different regions of Latin America are not in equal positions concerning the distance phenomenon. For example, Bolivia, Peru, Paraguay, and the Caribbean countries have been identified as more sensitive to innovative programs such as massive open online courses (MOOCs). Another example is Mexico, which has created "intercultural virtual universities" grounded in local cultures in which students' diversity has contributed to the increasing popularity of distance education.

Tertiary colleges and online universities programs of the region are developing mostly e-learning, blended learning, open programs, and MOOCs modalities. And there is an expansion of the use of open source software (such as Moodle and others) in higher education institutions.

However, the main challenge of distance learning is the very high dropout rates, which have increased in some cities to as much as 56%, according to the National Information System of Higher Education of Colombia (Murcia y Ramírez, 2015). It should be emphasized, however, that in Latin America, high dropout rates are not exclusive of distance learning and also exist in face-to-face education. Some of the reasons for this are poverty, inequity and social exclusion.

Moreover, as elsewhere, to become a "distance learner" means to assume serious personal responsibilities: high motivation, self-discipline and perseverance, systematic dedication, autonomous learning abilities, an ability for interdependence and communication in groups, digital literacy, and so on.

Current Situation

The most important organizations and networks in the field of DE in Latin America are the following:

- Consorcio-Red de Educación a Distancia—CREAD (http://cread.org/index-esp.html) is hosted by Nova Southeastern University (USA) (www.nova.edu/).
- Asociación Iberoamericana de Educación Superior a Distancia—AIESAD (http://portal.uned.es/portal/page?_pageid=93,323073&_dad=portal&_schema=PORTAL) is based in the Universidad Nacional de Educación a Distancia (UNED) from Spain, which is a big market and partner with the main Latin American virtual universities/courses.
- Red Iberoamericana de Informática Educativa—RIBIE (www.ribiecol.org) based in Colombia, a joint venture among institutions and groups working with the development and application of information and communication technologies (ICT) in education. This network has a program called Programa Iberoamericano de Cooperación en Ciencia y Tecnología para el Desarrollo (CYTED) created in 1984, undersigned by 19 Latin American countries, Spain, and Portugal, and dedicated to technological development, innovation, and research to articulate digital and virtual resources in general in education.
- Portal Educativo de las Américas (OAS) (www.educoea.org) supported by the Latin American states, has a network of virtual classrooms as a resource for online education and training opportunities. The Portal, created in 2001, provides access to more than 4,500 distance learning courses offered by accredited universities in all academic disciplines and at all academic levels, expanded to four languages.
- In the same line is CITEL (Comisión Interamericana de Comunicaciones) (www.citelcomunicaciones.com.ar/), with diverse projects promoting the excellence in the regulation ICT infrastructure through regulations and courses.
- Latin America and the Caribbean also have an impact in the International Council for Open and Distance Education (ICDE) (www.icde.org/), with great influence in local universities, associated institutions, and individual members in the region.
- Similarly, Instituto Internacional de la UNESCO para la Educación Superior en America Latina y el Caribe—IESALC (www.iesalc.unesco.org.ve/index.php/en/home) assumes a significant role for virtual education in the region.
- Observatorio de la Educación Virtual en América Latina y el Caribe (http://virtualeduca.org/observatorio-que-es.htm) was created in 2006 as a part of Virtual Educa, (www.virtualeduca.org/), which has great presence in this geographic area. It is a multilateral initiative with the goal of innovation in education for social transformation and sustainable development, created in 2001 and converted to a global effort in 2016.

In addition, international MOOC offerings (with more than 100,000 enrolled students and many university providers for courses) are the current competitors to the local DE courses in Latin America today. Coursera and others offer not only lifelong learning but also includ master's degrees in many subject areas. MOOC providers have made a concerted push to extend their reach into Latin America. Instead of having its content translated and localized for the region, Coursera partnered with some Latin American universities—for example, UNAM–Universidad Nacional de Mexico (www.educaedu.com.mx)—to produce original content in Spanish, as well as learning applications.

An Overview of Distance Education in Latin American Countries

The following is a brief enumeration of DE offerings in almost every Latin American and Caribbean country.

Argentina

Before the 1990s, DE systems were developed through printed material, radio, and TV to teach many topics, such as technical education ("Tele-Escuela Técnica" for 30 years). Later on, the Ministry of Education developed distance education systems for rural areas to train agricultural technicians, as well as the Distance Education Project PROCADIS (1993) to achieve democratic and sustainable development of these areas.

In 1990, CEDIPROE Center (Center for the Design, Production and Evaluation of Multimedia Learning Resources), a non-governmental organization dedicated to training at the post-graduate level, using printed material in the beginning, and after that distance courses through the Internet, ICT, and associated formats, to form the future producers of educational material for DE.

At the same time, RUEDA (1998) (http://rueda.edu.ar/) was formed as the Argentinian network of DE public universities, as a political project to promote research and experimentation of DE methods.

Educ.ar, the National Educational Portal (www.educ.ar), is a national open network for primary and secondary schools, through computers and the Internet, with 5 million students in 2007. Most DE training is aimed at primary and secondary level teachers. Educ.ar is a member of RELPE—Red Latinoamericana de Portales Educativos (www.relpe.org/).

In 1999, Universidad Nacional de Quilmes created the first virtual classroom (www.uvq.edu.ar/). This university has grown in a sustainable way and has more than 6,500 Argentine and international students at the graduate and post-graduate levels.

In the beginning of the 21st century, with the disruption of ICT, Web 2.0, and virtual open environments that facilitate collaborative and distributed learning, a technological convergence with different material to upload and download (online or offline, in campus, at home, etc.), there was an increase in the amount of higher education proposals.

Today, there are many public and private higher education programs in Argentina. Each Argentinian province has a traditional public university which includes virtual modality, such as the UBA XXI Program to support the first year of the traditional university programs (pre-degree level) (www.uba.ar/academicos/uba21/index.php); and the historical Universidad Nacional de Córdoba (www.unc.edu.ar/english), with more than 7,916 courses and 275,976 users/students; and The Universidad Tecnológica Nacional (UTN Virtual) (https://campusvirtual.frsf.utn.edu.ar/) with 31 regional faculties.

The most recent public universities, created at the beginning of the 21st century, are a mix of traditional and electronic university platforms used for the administrative aspects, organizations of students, professors, and so on. Others have online programs, such as Universidad Nacional de San Martín, (www.unsam.edu.ar/unsamdigital/), and Universidad Tres de Febrero—UNTREF (www.untrefvirtual.edu.ar/).

Among the private universities, the oldest ones are Universidad del Salvador (www.usal.edu.ar/) and Universidad de Belgrano (www.ub.edu.ar/distribucion-carreras-distancia-fedev). Both are located in Buenos Aires and offer on-campus and online programs, technical studies, and post-graduate studies.

The on-campus/online Universidad Blas Pascal (www.ubp.edu.ar/modalidades/modalidad-distancia) and Universidad Siglo 21 (https://21.edu.ar/content/campus) are both located in the province of Cordoba.

The Catholic universities also have an important role in distance programs. Therefore, many private institutions have DE programs with meaningful presence. In Argentina these universities have approximately 140,000 distance students of the ages of between 25 and 40.

DE proposals became very popular for national organizations such as the army, the navy, syndicates, non-governmental organizations (NGOs), and others, with thousands of students in fully accredited

(degree) distance and blended courses. Most institutions—including the newest MOOC—have centralized management for distance learning programs. Nearly a quarter of the institutions seek to increase their investments in distance learning which are managed by non-profit and for-profit private institutions in comparison to public institutions, that use open source learning management systems customized by each institution and, in recent times, cloud-based systems.

The participation in DE programs is more than 35% of online students and 25% of the learning offers. A recent regulation—Resolution 2641-E/2017, issued by the Ministry of Education—revisits former national laws and updates designs, implementation, evaluation, accreditation, credits, and certificates. The regulation, which determines the profiles of DE programs, applies to universities and other higher education institutions.

In general, there is no detailed information about DE programs or actual figures of undergraduate and graduate students (Secretaría de Políticas Universitarias, Statistic Yearbook, 2015 http://informacionpresupuestaria.siu.edu.ar/DocumentosSPU/diu/Anuario%202015%20-%20ESTAD%C3%8DSTICAS%20UNIVERSITARIAS%20ARGENTINAS%20-%20SPU%20.pdf).

Brazil

ABED—Brazilian Association of Distance Education—has surveyed, in its eighth year, the distance learning proposals in Brazil (Deming, 2016), and produced a report available in both English and Portuguese. It presents a picture of trends with categories of institutions that work in a distance learning modality, types of courses offered, audiences they reach, their organization information, and even profitability and investments. The institutions accredited by the Brazilian National Education System are found at all levels: primary, technical, undergraduate and graduate, formal and informal educational institutions with e-learning and blended learning courses, defined by federal law as having up to 20% of the workload offered in distance learning mode. Corporations and companies that supply distance learning products and services are also included.

This survey also confirms the growth in the number of institutions and companies working in distance learning in 2015. 5,048,000 students were enrolled in e-learning and blended learning courses: 1.1 million were in fully accredited (degree) courses; 3.9 million were in corporate or non-corporate open courses; half (53%) were women, and almost half were aged between 31 and 40; 70% of the students were working as well as studying. The drop-out rates for accredited distance learning courses was high, averaging between 26% and 50% in 2016 in private institutions, and less compared to the public institutions, which can be explained by different levels of access to the Internet.

It is difficult to know how representative these figures for Brazil are. In spite of the tremendous socio-economic differences between the regions and groups, 15–25% of the institutions surveyed offered MOOC-like courses. More information can be found at www.tonybates.ca/2016/11/04/a-survey-of-distance-education-in-brazil/.

Mexico

Mexican distance education offerings cover undergraduate and graduate levels, including master's and doctorate degrees in public and private universities (Navarrete-Cazales & Manzanilla-Granados, 2017). This exponential growth started in the 1990s and continues with DE innovations. This telebachelor's program created as a virtual educational national program has 150,000 users who are, on average, 27–28 years old. (www.excelsior.com.mx/nacional/2017/04/11/1157197).

Among many Mexican public open online university organizations, ILCE (Instituto Latinoamericano de Comunicación Educativa) is well-known. It was created by the United Nations Educational,

Scientific, and Cultural Organization (UNESCO), in 1954. It works as an international organization, with autonomous management, and is devoted to educational technology, educational communication, and distance education, with the partnership of all Latin American countries. After many re-configurations, today it offers many virtual courses in the blended learning format and others in master's and doctorate levels through its Higher School of Educational Communication (www.ilce.edu.mx/campus/).

The public and free Universidad Abierta y a Distancia de México (UnADM), founded in 2012 based on the former ESAD (Escuela Superior Abierta y a Distancia, offers 23 courses at the college level, ten at the university level and 19 technical programs, in traditional and blended learning formats (www.unadmexico.mx/portal3/index.php/campus*)*.

Universidad Nacional Autónoma de México (UNAM), a public university founded in 1972, is the largest public university in Mexico (www.unam.mx). In its 45 years of history, it has developed many programs through SUAyED (Sistema de Universidad Abierta y Educación a Distancia [http://suayed.unam.mx/]), an advisory board, and CUAED (Coordinación de Universidad Abierta y Educación a Distancia [http://web.cuaed.unam.mx/]), to offer academic programs in open and distance modality with an interesting variety of open and virtual courses through its online campus.

UDG-Virtual Universidad de Guadalajara (UDGVirtual [www.udgvirtual.udg.mx/]), open and free, is an institution that is part of the Universidad de Guadalajara, in Jalisco, which designs and develops electronic higher education programs through its Sistema de Universidad Virtual (www.udgvirtual.udg.mx), with 3,907 students and 75 professors.

The private Universidad Virtual del Sistema Tecnológico de Monterrey-TEC (www.mty.itesm.mx) which has a well-known historical informatics training, offers online programs with degree levels ranging from master's to doctorates. Other Mexican virtual universities are delivering academic courses, programs, master's, and doctorates in e-learning and blended learning modality.

Universidad Veracruzana (www.uv.mx/) is a public university that delivers mainly business administration and anthropology programs, other courses, in virtual modality (www.uv.mx/docencia/programa/default.aspx?tipo=0&opcion=M*)*.

Universidad Autónoma de Aguas Calientes (UAA [www.uaa.mx/nu/]) was created in 1973 based on the historical Agriculture School, founded in 1867. Today, it designs and delivers distance courses and programs.

The exclusively online Universidad Mexicana de Educación a Distancia (www.umed.edu.mx/) in Cuernavaca, Morelos, offers many virtual undergraduate and graduate programs, including national and international MOOC courses.

Some very innovative DE programs in Mexico are Telebachillerato Comunitario (www.sems.gob.mx/telebachilleratos), Tele-Secundaria, and the PREPA, which offers online secondary education to students aged 25–26 years old. In 2017, it had 3,000 students and 23 modules (www.prepaenlinea.sep.gob.mx*)*.

Additional statistics are available at https://web.cuaed.unam.mx/wp-content/uploads/2015/09/PDF/educacionDistancia.pdf.

Chile

Since 1992, the pioneer of non-traditional education proposals is the national educational portal called ENLACES (Centro de Educación y Tecnología del Ministerio de Educación, [www.enlaces.cl]), which facilitates access and use of ICT with the aim to improve the quality of education. It is a part of the Ministry of Education in Chile. Since 1998, Enlaces Network has been working with World Links for Development Programs, a World Bank initiative, to generate virtual global environments for learning.

Open learning has impacted Chile, for instance, in Pontificia Universidad Católica de Chile (www.uc.cl/), Universidad de Valparaiso (www.uv.cl/), and Universidad Católica del Norte (www.ucn.cl/home/), with its Distance Education Center, combining a digital platform and face-to-face modality.

Pontificia Universidad Católica de Chile also offers MOOCs and other types of open courses through its Campus Virtual TELED, with a diversity of courses for training in many areas (www.teleduc.cl).

Universidad de Playa Ancha (www.upla.cl/portada/), Universidad de las Américas (www.udla.cl/), and INACAP (Universidad Tecnológica de Chile [www.inacap.cl/portal]) are institutions which have incorporated teaching methodologies and e-learning and blended learning courses for programs in higher education, as well as training courses in other areas. They deliver digital cultural and educational content, also offering general links of interest to the wider community.

Universidad de Concepción (www.udec.cl/pexterno/) and Universidad de Antofagasta (www.uantof.cl/) are well-known for their DE programs, and UNIACC (Universidad de Artes, Ciencias, y Comunicación [www.uniacc.cl/]) has interesting e-learning proposals with private funding for the post-secondary level. The latter has 3,000 students in three campuses interconnected by multimedia technology. It delivers 31 academic programs awarding undergraduate diplomas and master's degrees, and it has a radio and TV station that broadcasts educational and recreational programs.

Many are exposing some serious problems related to DE in Chile. Some of them are the movement toward privatization, the strengthening of a domestic marketization oriented toward selling educational programs as commodities to students within the country, and the international commercialization as an indicative expansion by domestic and foreign institutions to provide distance education through foreign Internet sites for higher education levels.

As a result of these processes that happened after the emergence of the General Agreement on Trade in Services (GATS) in the framework of the World Trade Organization (WTO), higher education institutions in Chile and in many Latin American countries experienced considerable growth. While some organizations are more vulnerable to foreign influence, they also have opportunities to broaden their role and to be competitive in the global higher education market.

Colombia

Colombia has a long tradition in distance education which began with radio schools, radio networks, and Radio Sutatenza, addressed to the rural population.

Various universities were pioneers, such as Universidad Santo Tomás (www.ustadistancia.edu.co), and have wide experience.

Universidad Nacional Abierta y a Distancia (UNAD [www.unad.edu.co/]) was created in 1982 under the name of UNISUR. It delivers its programs throughout the country exclusively in open and distance modality.

Red Iberoamericana de Informática Educativa (RIBIE [http://cetics.org/ribie-col/]) has a leading role in the field of informatics. It is devoted to the inclusion of ICT, artificial intelligence, etc., into education, and in particular to distance learning. Since 2005, and with previous collaborations with organizations such as Universidad Central, Servicio Nacional de Aprendizaje (SENA), New Horizons, Acción Internacional, Instituto para la Investigación Educativa y el Desarrollo Pedagógico (IDEP), and Asociación Colombiana de Usuarios de Informática y Comunicaciones (ACUC), it became a corporation dedicated to design, development, and research of virtual educational environments. Colombia Aprende (http://aprende.colombiaaprende.edu.co/es/cainicio), the national educational portal, is included in this consortium.

Institute of Distance Education at Universidad del Tolima (IDEAD [www.ut.edu.co/]), based in the city of Ibague, is a public autonomous institution which manages its budget for several undergraduate

and graduate courses, in accordance to the Ministry of National Education. It is one of the largest and most important universities in Colombia, with regional centers in many cities: Ibague, Bogotá, El Tunal, Medellin, Cali, Pereira, Neiva, Armenia, among others.

Pontificia Universidad Javeriana (www.javeriana.edu.co) is a private Catholic university founded in 1623, and is representative of good practices of distance programs.

Universidad Antonio Nariño (http://apoyovirtual.uan.edu.co/), using open source Moodle, designs courses for retraining faculty and staff competencies.

Universidad De Los Andes (www.uniandes.edu.co) is one of the best private universities in Colombia, founded in 1948. Currently, it has over 12,000 students with over 1,100 professors. It has made an association with Coursera to promote massive virtual curses and expand the educational offerings to Latin America through 80 new virtual curses in Spanish and 70 captioned courses in English.

Colegio Virtual Siglo XXI (https://colegiovirtualsigloxxi.edu.co/) was founded in 1998 in Bogotá to provide students with primary and secondary education. Students may attend the school in person once a week for support, sports and cultural activities. It is recognized by SENA (Servicio Nacional de Aprendizaje [www.sena.edu.co/es-co/Paginas/Portada/virtual-educa32.aspx]).

Other important universities are Universidad Nacional de Colombia (www.unal.edu.co), Universidad Tecnológica de Pereira (www.utp.edu.co), and Universidad Industrial de Santander (www.uis.edu.co).

Universidad Pedagógica Nacional (www.pedagogica.edu.co/), Universidad del Valle (www.univalle.edu.co/), and Universidad Santiago de Cali (www.usc.edu.co/index.php/academico/educacion-virtual), all have virtual programs and post-study courses. Also the Universidad Autonoma de Manizales (www.autonoma.edu.co) has an interesting offer of Distance Education and the Universidad Autónoma Virtual de Bucaramanga (UNAB Virtual [www.unabvirtual.edu.co/]), Center for Technological Development at Virtual Campus, and the NGO EDUTEKA (Fundación Gabriel Piedrahita Uribe), with the aim to help educators to include virtual educational environments, through virtual free courses, content, tutorials, etc. (http://eduteka.icesi.edu.co/).

Among other universities operating in the country right now are Universidad de Santander (UDES), created in 2015, [www.udes.edu.co/]); Universidad EAN (created in 2016) in Bogotá (www.universidadean.edu.co); Universidad de la Sabana (Unisabana, created in 2016, www.unisabana.edu.co/]).

Uruguay

The Universidad de la República (www.universidad.edu.uy/) is the oldest and most traditional national face-to-face university in Uruguay. It has a few distance education courses.

A very revolutionary educational transformation mediated by technology for teacher education took place as a result of the national political governmental decisions to implement the Education Connectivity of Basic Online Learning (E-learning) Education called PLAN CEIBAL (www.uruguayeduca.edu.uy; www.ceibal.edu.uy) (Camerlati, 2012; Stanley, 2015).

The decision was made to provide connectivity and give each student a netbook so as to reach an impact on all of society, reducing the digital gap.

The plan to give access to digital information arises from the association OLPC (One Laptop Per Child). The pilot project was for all boys, girls, and teachers in primary public schools across the country, and is currently extending to higher media and technical education, and the national network of tutoring teachers.

But this program presents serious problems, like in many Latin American countries:

- Students who use borrowed machines, or have broken ones, cannot continue their homework, and others cannot connect to the educational portal due to lack of connectivity at home.

- Teachers are not trained enough in e-learning.
- 2009–2010 saw an increased percentage of computers that did not work and were not sent for repair.
- Anecdotal student evidence suggests that intensive use of technology in the classroom (three or more days a week) decreased between 2009 and 2010 and there is no data to determine whether this issue remained the same.

CEIBAL Plan has been committed to overcome these limitations through the following programs: FOR.MA.R.TE. Plan (Plan para la Formación del Maestro Referente Tecnológico, 2016), and ATENEA Plan (Atención Tecnológica-Educativa based on current needs), to accompany teachers for "in situ" management of virtual courses.

The CEIBAL English program began in 2012 through videoconferencing and student numbers increased from 1,000 to 25,000 in 2013, 50,000 in 2014, 77,000 in 2015, and 85,000 in 2016. In 2017, the program has reached 93% of learners in fourth to sixth year in urban primary and secondary schools. Plan CEIBAL designed the PAM (Plataforma Adaptativa de Matemática) that contains thousands of didactic activities, the CREA Virtual Platform and network for courses, repositories, etc. (http://cctenacional2014.wixsite.com/departamento-ceibal).

Universidad ORT de Uruguay (www.ort.edu.uy/) is the country's largest private university, founded in 1942 as a tertiary institution for vocational studies, and becoming a university in 1996. It is a member of the international network World ORT, founded in 1880 by the Jewish community in Saint Petersburg, Russia. It has 1,400 professors and 12,000 students in its face-to-face faculties and a rate of 8.6 students per professor. It includes distance education by videoconferencing. Universidad Católica del Uruguay (https://ucu.edu.uy/es) works along the same line.

Costa Rica

Costa Rica is a small country, very committed to DE. The main effort was in the 1970s with Universidad Nacional de Costa Rica (UNED [www.una.ac.cr/]). In the 1990s, it opted for a virtual course delivery format due to the massive enrollment of students (Rama & Bonilla, 2017): the Central Region of San Jose with 625 students, 184 students in Cartago, and Heredia Palmares with 181.

The high number of graduates per academic unit—2011 to 2012—shows an increase of enrollment and stability in the graduation rate. The figures show a higher percentage of unemployed professionals graduated in the UNED: more women than men (www.uned.ac.cr/2-uned/25-esta disticas-uned). Costa Rica (Bonilla) decided to emphasize DE systems, by public policies; this contribution should be imitated by the rest of Latin American countries.

Peru

Generally, in Peru, by the end of the 1990s, the inhabitants did not attend secondary school, and only a small part of the married women finished primary school. Due to the fact that employers have a lot of problems hiring qualified workers, distance learning begins to be a solution to obtain high school education and credentials necessary for employment.

HUASCARAN—the national primary and secondary school network—was created in 2001, and worked through computers and the Internet. With 2.53 million students and 48,267 teachers in 2005, the project ended in 2007. Although the project had several failures, it played an important role in compensating for profound illiteracy, especially among different ethnic groups (www.unicef.org/argentina/spanish/Peru_ok.pdf).

In addition, there are several joint projects among different Latin American countries aimed at improving the educational level of the Peruvian population through the new electronic technology, although exact numbers and figures were not be found at this time.

Nowadays, there are more private higher education programs in Peru. Nevertheless, the public Escuela Universitaria de Educación a Distancia (http://euded.unfv.edu.pe/) and Universidad Nacional Hermilio Valdizán has remarkable offerings, as do Programa de Educación a Distancia no Estatal (https://www.altillo.com/universidades/peru/online/Programa_de_Educacion_a_Distancia_no_Estatal.asp) and Asociación Nacional de Educación a Distancia (www.anced.org.pe/)—all of them are very young virtual programs.

Among the private institutions, the Catholic Church established the Panamericana Teleducación in 1961, the first Telescuela (teleschool), using television programs to complement formal education. In 1964, the public INTE (National Institute of Teleducation), was formed; it provided radio and television distance-education projects, until its closing in 1990.

Other universities that have higher studies in distance modality include: Universidad Alas Peruanas (www.uap.edu.pe/), Pontificia Universidad Católica del Perú (www.pucp.edu.pe/), Universidad Jose Carlos Mariategui (http://ujcm.edu.pe/), Universidad Antonio Ruiz of Montoya (www.uarm.edu.pe/), Universidad Católica de Santa Maria (www.ucsm.edu.pe/), Universidad Católica Sedes Sapientiae (www.ucss.edu.pe/), Universidad Peruana Los Andes (http://upla.edu.pe/web/), Universidad Peruana de Ciencias Aplicadas (www.upc.edu.pe/), and University San Martin de Porres (www.usmp.edu.pe/). The Universidad Privada de Tacna (www.upt.edu.pe/upt/web/index.php) and the Universidad Católica Los Ángeles de Chimbote (UDALECH) (www.uladech.edu.pe/) are conventional universities, like San Ignacio Loyola University (www.usil.edu.pe/), both with virtual campuses for regular programs and post-studies courses. There are no updated figures about these institutions on their websites.

There is great unevenness among these institutions in regards to access, management, technological infrastructure, teaching and learning strategies, and others. For example, in 2011) the application forms at Universidad Inca Garcilaso de la Vega (www.uigv.edu.pe/wp/) are on paper, and the institution is always delay, sometimes takes a couple of months to process those application forms.

Ecuador

Universidad Técnica Particular de Loja, UTPL (1971) (www.utpl.edu.ec/) is a private Catholic educational benchmark institution, which offers face-to-face, open, and distance learning. CALED (Instituto Latinoamericano y del Caribe de Calidad en Educación Superior a Distancia [www.caledead.org/]), as a part of this university, contributes to improving the quality of higher education with the mission of defining criteria for quality in DE courses.

Bolivia

As in many countries, traditional universities in Bolivia have begun offering DE programs in online programs and virtual courses. Such is the case of Universidad Católica Boliviana San Pablo (www.ucbscz.edu.bo/es/EaD_2017), the public university of the Escuela Militar de Ingeniería (EMI [www.emi.edu.bo/]); the private Universidad Nacional SigloXX (UNSXX [http://unsxx.edu.bo/]), Universidad Virtual de la Armada Boliviana (www.egnvirtual.net/), Universidad Autónoma Juan Misael Saracho (UAJMS [www.uajms.edu.bo/]), Universidad Privada De Santa Cruz De La Sierra (UPSA [www.upsa.edu.bo/]), and Universidad Privada San Francisco de Asís (USFA [www.usfa.edu.bo/]).

There is no data available from their webpages in regards to enrollment, completion rates, or other statistical data.

Venezuela

This country has traditional universities such as Universidad Central de Venezuela (www.ucv.ve/). A full pioneer DE university—UNA (Universidad Nacional Abierta [www.una.edu.ve/])—was created in 1982.

In the end of the 1990s, many other universities adopted electronic technology to innovate in the educational administration, such as Universidad Rafael Belloso Chacín (www.urbe.edu/index.jsp), Universidad Católica Cecilio Acosta (www.unica.edu.ve/), Universidad Nueva Esparta (http://une.edu.ve/une/), Universidad Católica Andrés Bello (www.ucab.edu.ve/), and Universidad Yacambú (www.uny.edu.ve/), with academic programs and courses online and on campus. They specialize in teacher training, in the same way as Universidad Pedagógica Experimental Libertador (www.upel.edu.ve/), a 63-year-old institution.

Nowadays, the Ministry of Education has centralized the decisions about the dynamics of distance learning, and it controls its delivery. Therefore, every university has to ask for permission to have a virtual platform to offer distance education, in times of great demand for e-learning programs.

The deficit and absence of funding and electronic infrastructure in general limit public universities in expanding DE programs today.

Honduras

It is a small country with 8.6 million inhabitants. The intention of different social and educational reforms and initiatives is not only to democratize but also increase the general educational access, since the access rate is one of the lowest in Central America as of 2014.

According to a 2010 report by the Honduran Commission of Human Rights, approximately 220,000 young people, roughly 10% of the population between the ages of 5 and 17 have no access to the education system. Among these children, 75.3% live in rural areas, and as a result, many pupils at the age of 13 leave school to start work in the fields. To help overcome this problem, the Instituto Hondureño de Educación is working in a distance learning radio project IHER (www.honduras.elmaestroencasa.com/), and the enrollment has been increasing in rural youth of 18–24 years old who are outside system: here the DE begins to be crucial.

Panama

Universidad Abierta y a Distancia de Panamá; (https://unadp.ac.pa/; www.coneaupa.edu.pa/?q=content/universidad-abierta-y-distancia-de-panam%C3%A1) and UTP Virtual (Universidad Tecnológica Virtual de Panamá [www.utp.ac.pa/]) are the main programs running today in Panama, offering public vocational, tertiary, and university online courses.

An Overview of Distance Education in Caribbean Countries

Cuba, Dominican Republic, Puerto Rico, Honduras, Guatemala, Panama, and some small Caribbean islands, show nowadays strong demand for and, thus, growth in the enrollment in online distance learning and blended learning modalities.

Cuba

In 1959, the Cuban Revolution led to the creation of the Sistema Nacional de Educación aimed at providing basic literacy education. The traditional Universidad de La Habana (University of Havana,

or UH) was founded in 1728. Its development was supported by UNED from Spain in 1979, and the faculty of education with distance education and educational technological innovations, in 1994.

The online EDU (Cuba Educa [www.cubaeduca.cu/]) is for training university professors. In 2006, 10,000 distance students were enrolled in programs called "directed education," centralized in the Secretary of the Ministry (http://eddist.udg.co.cu; retrieved December 16, 20 17), with 15 centers for post-study virtual courses.

Other universities include Universidad Virtual de Salud Cubana (UVS [www.sld.cu/uvs/]), Instituto Superior de Medicina (specializing in medical sciences) in Havana (UCMH [http://instituciones.sld.cu/ucmh/]), Vladimir Ilich Lenin University, in Las Tunas, created in 1979 (www.ecured.cu/Universidad_%E2%80%9CVladimir_Ilich_Lenin%E2%80%9D_de_Las_Tunas), Universidad de Granma (UDG [www.udg.co.cu/index.php]), Universidad of Camagüey (www.reduc.edu.cu/pregrado), and the well-known Universidad de Ciencias Informáticas (UCI [www.uci.cu/universidad/campus]).

In general, the students are younger than 35 years old, but there are no exact data about student characteristics or course completion in Cuban distance education courses.

Dominican Republic

The Global Distance Learning Project of the World Bank (http://documents.worldbank.org/curated/en/517771468248707621/Dominican-Republic-Global-Distance-Learning-Project), in 2006 states that the DE proposal was satisfactory for this country, but the institutional development and impact was modest and the performance was unsatisfactory.

Most distance learning proposals are religious, with more private than public offerings. The institutions have diverse conditions to accredit and license DE undergraduate degrees (bachelor's degrees), and/or postgraduate degrees (master's or doctoral degrees). The courses predominantly are in non-distance education format, though this is changing currently: the Universidad Autónoma de Santo Domingo (http://uasd.edu.do/index.php; http://virtual.uasd.edu.do/; http://hoy.com.do/uasd-transita-hacia-un-nuevo-modelo-educativoaula-virtual/).

The private Pontificia Universidad Católica Madre y Maestra, created in 1962 (PUCMM [www.pucmm.edu.do]) offers degree and post-study in face-to-face and online courses (https://campusvirtual.pucmm.edu.do//moodle/).

Instituto Tecnológico de Santo Domingo (www.intec.edu.do/), Universidad APEC (https://unapec.edu.do/) (with its online secondary school), Universidad Tecnológica de Santiago (www.utesa.edu/webutesa/home.htm), Universidad Iberoamericana (www.unibe.edu.do/es), Instituto Tecnológico de las Américas (www.itla.edu.do/), Universidad Interamericana (www.unica.edu.do), Universidad Nacional Tecnológica (www.unnatec.do/), and Universidad Central del Este (https://sp.uce.edu.do/SitePages/Home.aspx) are among recent virtual educational institutions in the country. Because they are relatively new establishments in the area, it is difficult to obtain student and performance data at the moment.

Puerto Rico

Puerto Rico shows a confluence and symbiosis between the face-to-face and distance education programs. Students enrollment in total or partial distance education programs is low and is confined, in general, to private universities. All of them are in a process of expansion, currently,

beyond their political dependence to the United States, with many online programs (but in English).

Small Caribbean Islands

Online education growth requires significant changes in the organizational culture and methods of teaching and learning, and political decision for open campuses, for secondary and tertiary levels.

The University of the West Indies (UWI [www.uwi.edu/index.asp]) is coping with some transitional challenges caused by the shift from traditional education delivery to online courses. It serves 16 developing countries in the Anglophone Caribbean area and has been providing distance education since 1978 (Marrett & Harvey, 2001). The newest campus of UWI, the Open Campus, was created to increase access to education (Thurab-Nkosi & Marshall, 2010) by leveraging the opportunities offered by the Internet.

U.K. transnational education (TNE) delivered by U.K. universities offers higher education programs overseas, by opening branch campuses and employing local Caribbean staff (TNE Report, 2015).

Guyana is currently working on the Guyana In-Service Distance Education (GUIDE) to improve the quality of secondary education training for untrained, unqualified, practicing teachers using a mix of distance education methods and face-to-face sessions with tutors (Guyana Ministry of Education, 2013).

Since 2006, the University of Guyana (www.uog.edu.gy) and the Anton de Kom University (www.uvs.edu) of Suriname are part of the Caribbean Universities Project for Integrated Education (CUPIDE [http://cupide.dec.uwi.edu/]), a joint project of UNESCO and the University of West Indies, to improve human resources abilities via DE programs. (ECLAC, 2006).

Besides a UNESCO pilot project, there is little or no data found for distance education in Suriname, Trinidad and Tobago, Aruba, or Jamaica.

Conclusion

There has been a great expansion in the growth of DE—mainly in the higher education sector—with a surprisingly high enrollment of low income students. However, almost 50% of the students do not finish their programs and get a diploma.

It is recognized that the flexibility and ease of access of ICT and Internet networks offer numerous educational opportunities in Latin American and Caribbean countries. However, DE also encounters a lot of problems, especially in providing a real commitment to social change, and overcoming economic and social limitations.

Having a clear vision of the array of the DE offerings can help to address these challenges and increase online provision of higher education to the peoples of Latin America, the Caribbean region, and beyond.

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39
DISTANCE EDUCATION IN ASIA
Indonesia and Philippines

Tian Belawati and Melinda dela Peña Bandalaria

Contextual Background

Asia is one of the biggest continents in the world with a population of over 4.2 billion people, which constitutes 55.1% of the world population (InternetWorldStats, 2017). Asia is also a region with the highest Internet users (over 2 billion people). This has ranked Asia as first in the number of Internet users in the world (48%), significantly above Europe at 17%, which is ranked second. However, Asia's average penetration rate is only at 48.1%, which is still behind North America (95%) and Europe (85.2%). Nevertheless, several Asia countries such as Brunei Darussalam, Japan, and Sourth Korea have penetration rates comparable to the most wired countries in the world at above 90%. Figure 39.1 shows the number of Internet users and the Internet penetration in Asia compared to the other continents.

With such a large population, human resource development has become a challenge and a major issue for the majority of Asian countries due to gaps in access to the education system. Hence, it is logical that many countries adopt the system of distance education to accelerate their human resource development. As we know, distance education has been proven effective in widening access to education and accelerating the capacity building of the ample human resources, especially at the tertiary level.

At the tertiary level, the most significant distance education providers in Asia are the open universities, which offer both degree and continuing education programs entirely through distance education. These open universities adopt different models of distance education and also range widely in the size of operations depending on the number of students. The Asian Association of Open Universities (AAOU) has on its membership roster 45 distance education institutions. Of the 62 largest mega open universities, eight are located in Asia and are serving nearly 10 million students (Wikipedia, 2018). These mega open universities are presented in Table 39.1 with their respective number of students.

Distance Education in Indonesia

Indonesia is one of the key players and providers of distance tertiary education in Asia. With over 50 million students and 2.6 million teachers in more than 250,000 schools, Indonesian educational system is the third largest education system in Asia and the fourth largest in the world behind only China, India and the United States (The World Bank, 2014). The Indonesian educational

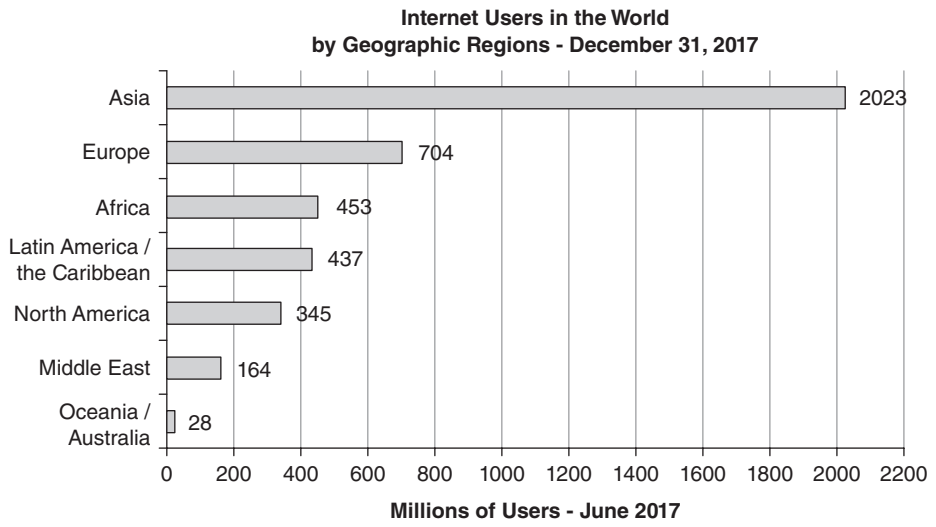


Figure 39.1 Internet users and Internet penetration in Asia compared to other geographic regions

Table 39.1 Asian mega open universities

No	*Institution*	*Country*	*Founded*	*Enrollment*
1.	Indira Gandhi National Open University	Delhi, India	1985	4,000,000+
2.	Anadolu University	Eskisehir, Turkey	1958	1,974,343
3.	Allama Iqbal Open University	Islamabad, ICT, Pakistan	1974	1,326,948
4.	Payame Noor University	Tehran, Iran	1987	800,000
5.	Bangladesh Open University	Gazipur, Bangladesh	1992	650,000
6.	Dr. B R Ambedkar Open University	Telangana, India	1982	450,000
7.	Universitas Terbuka	Jakarta, Indonesia	1984	300,000
8.	Korea National Open University	South Korea	1972	210,978

Source: based on Wikipedia, 2018 (except for Universitas Terbuka, the number of enrollments has been corrected)

system is based on the Law of National Education which has been in effect since 2003, initially under the responsibilities of two ministries—namely, the Ministry of National Education and the Ministry of Religious Affairs. In 2015, the Ministry of National Education—which was responsible for managing all public education from kindergarten to higher education—was recognized and was mandated to only cover the early childhood education up to secondary education. The management of higher education shifted to the Ministry of Research and Technology, which was then renamed as the Ministry of Research, Technology, and Higher Education.

In Indonesia, the formal basic education starts with six years of primary schooling and three years of junior secondary education, which are compulsory. At the high secondary education level, Indonesia has two streams: one is aimed at those who intend to attend higher education institutions, and the other is for those who plan to find jobs right away (vocational). At the tertiary level, there are several types of higher education providers, including universities, academies, polytechnics, and institutes, each focusing on different objectives of education. At present, there are about 2,276 higher education institutions in Indonesia, but only about 120 are government owned (Kementrian Riset, Teknologi, dan Pendidikan Tinggi, 2017).

Realizing the challenge for developing its ample human resources, Indonesia has embraced a multidimensional approach to educating its people, including in the nonformal and formal education sectors. In the non-formal education sector, distance education is used to provide out-of-school education (known as Pendidikan Luar Sekolah or PLS) to people who did not have the chance to go to regular school when they were of school age. This program was packaged as Paket A (equivalent of primary school), Paket B (equivalent of lower secondary school), and Paket C (equivalent of senior secondary school). Since 1991, these programs have been successful in accelerating education. The certificates of Paket A, B, and C are legally accepted as equal to those obtained from regular schools. Therefore, many graduates of these Pakets A, B, and C eventually go to regular higher education programs and graduates as Sarjana (bachelor's).

In the formal education sector, distance education is employed at both secondary and tertiary/higher education levels. Heterogeneity of the population (socio-economical, geographical, and demographic) have forced Indonesia to adopt different and flexible pathways using various educational technologies to educate its people. However, variations in quality of both educational infrastructures and human resources (e.g., teachers) have also led to variations in quality of the educational process. In spite of this reality, the government of Indonesia has committed to capitalizing on distance education (using information and communication technologies) as stated in the National Education Law (UU no. 20/2003) and the Higher Education Law (UU no. 12/2012). Especially at the higher education level, the commitment is further elaborated in the National Higher Education Standards (Permendikbud no. 49/2014) and the Government Regulation on Higher Education Governance (PP no 4/2014). All laws and regulations in principle confirm and legalize the use of distance education, technology-enhanced education, and online education as part of the national education system.

At the secondary education level, the government founded an Open Junior Secondary School (OJSS) in 1978–1979 and Open Senior Secondary School (OSSS) in 2014. The OJSS was based on the blended model: pre-produced printed materials were studied independently and complimented with compulsory face-to-face meeting every week in the so-called Mother Schools during the weekend. The first phase of the OJSS was conducted from 1978–1979 until 1983–1984. Although there were several challenges faced, the OJSS was continued and is still operating. While inspired by the OJSS, the OSSS combined pre-produced learning materials, online discussions, and face-to-face meetings. There are three types of interaction methods: predominantly online (80% online and 20% face to face), balanced (50% for both online and face to face), and predominantly face to face (20% online and 80% face to face). Since it is still in its initial stage, the OSSS is currently being offered only in seven locations (mother schools) and has only around 960 students (http://smaterbuka.kemdikbud.go.id/web/).

At the higher education level, distance education cannot be separated from teacher education and training. With a long history of the implementation of distance education in Indonesia, the most significant applications are those for the teacher education/training and for higher education in general. Therefore, this chapter will focus on distance education for teacher education and training, distance education at higher education level, and Universitas Terbuka as the biggest distance education program in the country.

Distance Education, Teacher Education/Training, and Higher Education

Although distance education has been used since the early 1950s for some training programs, it was not until 1984 when the Open University (better known as Universitas Terbuka or UT) was established that distance education system started to play a significant role in the Indonesian higher education system and be known by the general public.

At the secondary education level, distance education practice was marked by the establishment of Open Junior Secondary School in 1979. The instructional system of the Open Junior Secondary

School was based on pre-produced learning materials supplemented with audio programs and some face-to-face counseling during the weekend in the so-called Mother School (Sekolah Induk). Following this model but employing more online approach, an open high secondary school was established in 2014. Partnering with around 50 regular high secondary schools, the open high school has now almost 1,000 students throughout the country (http://smaterbuka.kemdikbud.go.id).

At higher education level, the first distance higher education program was the Education Radio Broadcast Program (Siaran Radio Pendidikan, or SRP) in 1952, which was designed for the returning soldiers who left their schools because of the war. Later, in 1955, the government set up a correspondence teacher training program (known as Balai Pendidikan Guru, or BPG Tertulis) aimed at improving the knowledge and skills of practicing teachers and upgrading the competency of teachers who were not yet qualified to teach certain levels (Siahaan, 1999). It is this program that gave birth to the long relationship between distance education and teacher training/education in Indonesia.

In 1970, the government revitalized the SRP Program in several areas to deliver in-service training for primary education teachers, which was considered successful and was later formalized as a collaborative program between the Ministry of Education and Culture and the Ministry of Information that is responsible for the national radio networks. This program was broadcasted twice a day on Radio Republik Indonesia (RRI) and relayed by local radio stations, both government and privately owned. The broadcast was supplemented by a study guideline and learning materials containing the title, introduction, instructional objectives, and summary of the content. The participants were grouped to make the learning process easier and facilitated by the respective local schools where they were teaching. It is this correspondence teacher training and the SRP programs that later inspired the establishment of the Open University (Universitas Terbuka) in 1984.

Universitas Terbuka was designed to widen the access of people to higher education and to upgrade the qualification of practicing teachers. Since the beginning, aside from the regular university study programs, UT offered various bachelor's programs for in-service junior and senior secondary school teachers. As a further effort to accelerate the speed of teachers' qualification upgrading, the government in early 1990 instructed Universitas Terbuka (UT) to run a special project offering two-year (D2) and three-year (D3) Diploma Programs for practicing primary and secondary school teachers at a distance. In 1992, the government also transformed the SRP Program into a two-year diploma program by the name Diklat SRP. Graduates of both UT and the Diklat SRP were granted diploma equivalent of D2 and D3 certificates. Naturally, with time, the formal Diklat SRP Program was ceased, and teachers' qualifications were upgraded by UT only. In 2002, UT also started offering bachelor's programs for in-service primary education teachers, and since 2007, for in-service early childhood education teachers known as S1-PGSD and S1-PGPAUD.

In the early 1980s, the government also created a distance education program aiming at enhancing university lecturers' competency in instructional design and pedagogy. The program, which was known as Akta Mengajar V, started in 1981 and then was transferred to UT in 1984 until 1986. The program was revised and was re-launched as face-to-face training programs known as Applied Approach (AA) and PEKERTI conducted by several universities while UT mainly provides coaching and advice to the training instructors and facilitators.

The issue of teachers' quality and qualification has been the focus of the government of Indonesia for quite some time. Many policies and regulations are designed and launched aiming at enhancing teachers' competency and professionalism. The last Law on Teachers and Lecturers (UU no. 14/2005) requires all teachers to hold a minimum qualification of a bachelor's degree. This law created for Indonesia a huge challenge to certify about 66% of teachers (2.7 million) to qualify for teaching positions; 1.1 million of them are primary education teachers (Pannen, Riyanti, & Pramuki, 2007). Therefore, to accelerate the teacher certification process conducted by UT, the government—through the Directorate General of Quality Improvement of Teachers and Education Personnel (DGQITEP) and Directorate General of Higher Education (DGHE)—launched the

HYLITE Program, which is Hybrid Learning for Indonesian Teachers, in January 2007. Facilitated by SEAMOLEC, an ASEAN intergovenmental organization focused on open learning, the program employs hybrid learning with a strong information and communication technologies (ICT)-based learning component and is implemented by a consortium of 23 teacher universities. By the time of writing this chapter, UT alone has upgraded the qualification of over 1.3 million practicing primary and secondary school teachers into D2, D3, and S1 levels. The HYLITE Program, through its 23 teacher universities, has upgraded the qualification of almost 7,000 primary school teachers.

As mentioned, Universitas Terbuka was the first university to offer all of its programs entirely at a distance. Since its establishment in 1984, UT was the only university that was given a permit to offer distance education. Other universities were not allowed to deliver their courses at a distance until 2001, when the Ministry of National Education launched a Ministerial Decree allowing other universities to offer distance courses. Nevertheless, no other university voluntarily offers any distance learning programs except the teacher universities that are involved in the Government initiated HYLITE Program. Only after e-learning mode became widely known by Indonesian universities and after the launch of the Higher Education Law in 2012, which specifically acknowledged distance education as an accepted delivery mode and as an integral part on the national higher education system, did a few universities start to experiment distance/e-learning.

As the government does not allow any new establishment or conversion of regular universities into becoming an open university like UT, other universities offer e-learning courses as part of their regular campus-based programs, some as supplements/enrichments and some as replacement of the class meetings. Either way, their distance learning is best to categorize at a course level only. The government allows universities to offer distance learning courses without a special official permit only if they offer the maximum of 50% of the courses in any particular program's curriculum. Only if they offer more than 50% of the courses do they need to acquire the official permit from the Ministry of Research, Technology, and Higher Education. Failing to fulfill this requirement, the universities would not be allowed to grant credentials to their distance learning program graduates. There are no data available documenting the number of students and graduates of distance/e-learning program from those universities. It is perhaps because the graduates are still categorized as regular program graduates. However, some of the universities that are offering significant e-learning as parts of their teaching methodologies are the University of Indonesia (UI), Gajah Mada University (UGM), and Bina Nusantara University (UBINUS). UI and UGM are public universities, while UBINUS is a private university.

Universitas Terbuka

Universitas Terbuka (UT) is a state-owned university, established in 1984 and the only university in Indonesia that exclusively uses open and distance education systems. As mentioned, the mandate of the university is to widen access to higher education for all citizens and to upgrade in-service school teachers' qualification up to the full-teacher training degree (bachelor's). The university uses open and flexible distance learning systems to allow every Indonesian citizen to enroll without the restriction of age, residence, or duration of study. The only requirement is that students must have a high school certificate or its equivalent. With this system, UT has been able to reach a wide range of students and currently has about 300,000 registered students. This has made UT as the seventh biggest mega university in the world (Table 39.1). This has also placed UT as the biggest contributor to Indonesia's 28% higher education participation rate.

Following up on the given mandate that later became the university's mission, UT carefully designs its instructional system and selects the most appropriate technology to use. Understanding the characteristics of the students and of Indonesia's national ICT infrastructure, UT purposively maintains the

use of self-instructional and self-contained printed learning materials as the main learning medium. Nevertheless, all kind of educational media are also being used to supplement and compliment the learning process. As the country's Internet penetration is increasing, UT also increases the use of online materials and student support services as parts of the official instructional system.

Currently, there are three categories of UT's learning schemes for students to choose in accordance with their own situations, preferences, and conveniences. The first and the modest scheme is that students study independently (alone or in study groups), following the pre-produced learning materials which now come as a multimedia package (printed books and audio/video programs). They may also access the online supplementary materials provided by the university's digital library through the UT learning portal. The online supplementary materials include those produced in-house and various open educational resources (OERs). The second scheme is the same as the first one, but also includes free online tutorials, which are facilitated by assigned online tutors. The online tutorials are similar to e-learning using a Moodle-based learning management system (LMS). The third scheme is also based on the first model but also includes face-to-face tutorials (eight meetings per semester except in some cases) which are organized in the regions by UT's 39 Regional Offices. Figure 39.2 lays out these three alternative learning schemes. It is also worth stating that most teacher training programs make face-to-face tutorials compulsory. Furthermore, laboratory work and field practical work which are required by the courses are also compulsory regardless of the learning scheme chosen. And, for graduate programs, online and face-to-face tutorials (four meetings per semester) are also obligatory.

Within this framework, students may select the learning scheme that best suits their situations. It is important to note that students may also participate in both online and face-to-face tutorials for either the same or different courses. Therefore, it is difficult to categorize students by their chosen learning schemes. However, the number of students participating in online and face-to-face tutorials can give some indication on the popularity of the scheme.

The online examination, which has been available since 2006, is not intended to replace the face-to-face/pencil-and-paper examination, but rather to accommodate students who for some reason cannot attend the scheduled pencil-and-paper examination, need to do re-examination for past courses, or have conflicting examination sessions for some courses. The use of online examination

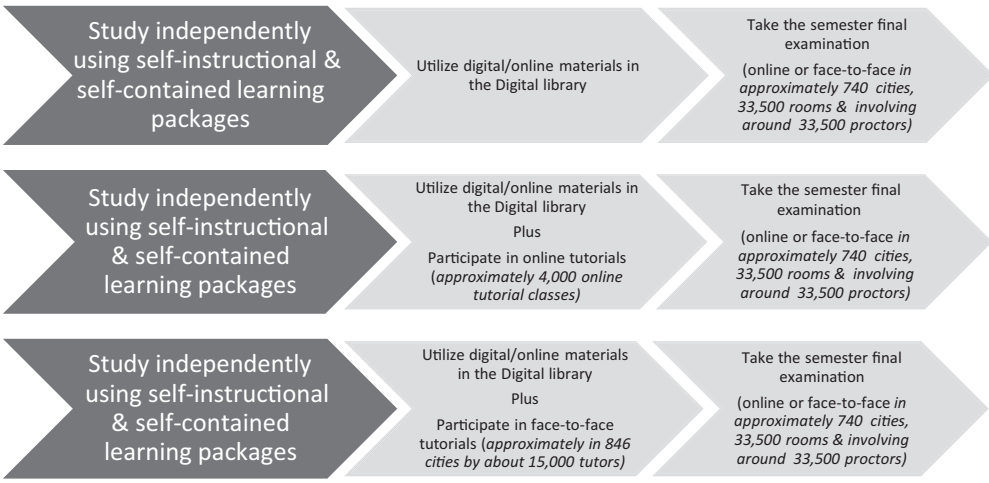


Figure 39.2 Learning schemes at Universitas Terbuka

Table 39.2 Number of registered students by learning scheme (semester 2016.2)

Tutorial	*Number of Students*	*Number of Student-Course Examinations*
Online	83,816	459,441
Face to face	158,799	411,923

Source: Universitas Terbuka (2016)

by students has also been increasing. The data show that in Semester 2015.2, there were 7,772 online examination takers with a total of 12,169 student-course examinations (Universitas Terbuka, 2016). These data of online tutorials and examinations provide some indications that most UT students still prefer the more conventional distance learning scheme. This is partly due to the fact that Internet penetration in Indonesia is still low (about 30.5%) and unevenly distributed throughout the country (InternetWorldStat, 2017).

With the increasing number of younger students (about 46% are under 30 years old); UT has also embraced social media and integrated it into the online learning system. Young students, who generally just graduated from high school, usually need more guidance and are more dependent, psychologically and emotionally, and also need social interactions. It is for this reason that UT is now providing several programs and learning tools to assist and help students cope with the distance education environment (Prasetyo & Belawati, 2014). The key is personalization of services within the mass education system, including the use of the simplest technology such as short message services (SMS) system with which UT regularly sends personalized messages such as birthday greetings, season greetings, and motivational messages. Feedback from students shows that they appreciate the personalized greetings and reminders. Students expressed that they felt being treated as persons and not just as a statistic in a student database (Prasetyo & Belawati, 2014). SMS is also considered ideal because the mobile phone penetration in Indonesia is very high (around 120%), and that information gets right into the students' hands.

Taking advantage of this, UT online learning—i.e., the online tutorials—has also been made available using mobile applications since 2013 using the Moodle mobile apps.

The mobile version of online tutorials is well appreciated by students. A survey conducted by Padmo, Belawati, Idrus, and Ardiasih (2017), revealed that 94% of 767 surveyed students reported accessing the online tutorials through their mobile devices. The survey also found that students use different devices to access the online tutorials including smartphone, laptop, and tablet. However, almost 74% of them access the mobile tutorials through their simple mobile phones and smartphones. On the other hand, only about 27.4% of the surveyed students access the online tutorials through personal computers. This is in line with the high penetration rate of mobile devices in Indonesia, and indicates the potential use of mobile learning as an educational mode in the country (Figure 39.3).

In line with the advancement of social media, students expect UT to communicate with them through various social media such as Facebook, Twitter, Google+, and LinkedIn. Students—like any other social media users—are more honest and open in expressing themselves on social media sites (Prasetyo & Belawati, 2014). Therefore, UT is able to collect honest and immediate feedback regarding their opinions of and feelings about UT services. Likewise, UT also uses social media to disseminate information about academic calendars, important announcements, new services, etc. Social media also helps students to form communities based on their interests and study groups where they study together (Prasetyo & Belawati, 2014). The latest additional online facility that is provided for the students is Office365, which offers integrated communication tools combined with

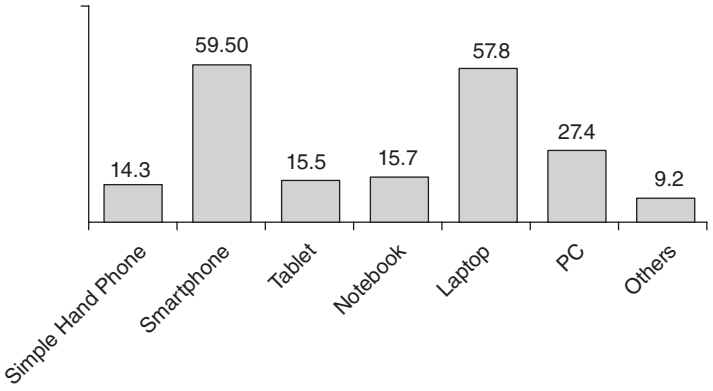


Figure 39.3 Devices for accessing online tutorials

Source: Padmo et al. (2015)

social media tools and productivity application such as Word, Excel, and PowerPoint. Therefore, students in one single interface application can create a document file, share it with others using email or post it in his/her "wall" on the social media page, and invite others to make a comment or respond to it. Students can even invite other students to discuss their project using webinar application. Through collaboration with Microsoft, UT students are provided with access to the Microsoft Office365 for free, including 50 MB of personal cloud storage for every student.

As any educational institutions in the world, many Indonesia's universities have also started to produce and offer OERs. UT, as part of its Community Service Programs, has established a dedicated open educational resources portal called SUAKA (Sumber Pembelajaran Terbuka or OER), which now contains thousands of multi-platforms open materials (www.ut.ac.id/OER/index.html).

Starting in 2014, UT has also offered massive open online courses (MOOCs) for the general public. UT's MOOCs are also intended to serve as the university's community service.

The first MOOC offering was in the second semester of 2014 with five courses; each lasted for about 6–8 weeks. The courses, which were public speaking, marketing management, English for children, distance education, and food processing, were all delivered in the national language of Bahasa Indonesia. The first cohort of courses attracted some 3,476 participants, and 424 of them completed the course and were granted certificates of completion (Hewindati & Belawati, 2017). As Table 39.3 shows, the average completion rate is about 12%. This completion rate is better than the general MOOCs completion rate of 5% reported by various studies in other parts of the world (Belawati, 2014).

Based on this experience, UT increased the number of MOOCs in the subsequent semester (2015.1) to 13 courses. However, due to the short time for promotion, the number of participants in the second cohort dropped significantly to only 11–69 persons per course, and six of the courses did not even have any participants. Thus, in the third cohort in Semester 2015.2, UT reduced the number again and offered only six courses, including one MOOC delivered in English (Association of Southeast Asian Nations [ASEAN] integration).

It is interesting to note that most participants of UT MOOCs are only graduates of high school (74%), while only 24% of participants have already had higher education degree at bachelor's and master's level. This profile is different from that of MOOCs participants in other countries which are mostly bachelor's degree holders (Ho et al., 2014; McKenzie, 2014). In regards to their working status, UT MOOCs participants are also mostly workers (51%), entrepreneurs (25%), civil servants (12%), and only 12% claim to be unemployed. Age wise, the participants are in the range of 18–69 years old with 74% of them in between 25 and 40 years old (Hewindati & Belawati, 2016).

Table 39.3 Participants of MOOCs in 2014.2

No	*MOOC*	*Number of*		
		Participants	*Certificates Granted*	*%*
1.	Public speaking	965	107	11.1
2.	Marketing management	907	53	5.9
3.	English for children	648	82	12.7
4.	Distance education	488	64	13.1
5.	Food processing	468	118	25.2
TOTAL		**3,476**	**424**	**12.2**

Source: Hewindati and Belawati (2016)

Distance Education in the Philippines

The Philippines is the world's second-largest archipelago after Indonesia, and consists of about 7,100 islands. It is also the world's 12th most-populous country with over 106 million people which is roughly equivalent to 1.4% of the world's population. The median age in the Philippines is 24.3 years. In 2017, the Philippine National Economic Development Authority (NEDA) published the country's Development Plan for 2017–2022 which envisions the Philippines to become an upper-middle income country by 2022, based on more inclusive economic growth that will reduce inequalities and poverty, particularly in rural areas. This vision very much depends on the human capital development, which, in turn, is predicated upon expanding access to and participation in education, as well as on improving its quality (Macha et al., 2018), a responsibility which resides in higher education institutions of the country. Also, there is expectation to produce graduates with industry-relevant knowledge and skills to support the major industries which are significantly contributing to the economy of the country.

The Philippine Education System

There are three agencies handling the different levels of education in the Philippines, or what is known as trifocalized education system: the Department of Education is responsible for basic education, the Commission on Higher Education oversees tertiary and graduate education, and the Technical Education and Skills Development Authority (TESDA) deals with regulation of technical-vocational courses and middle education. "Trifocalization" was among the recommendations of the Congressional Commission on Education (EDCOM) in 1992, which aimed to oversee the current state of Philippine education. Prior to the Enhanced Basic Education Act of 2013, which added two additional years to the country's basic education, the Philippines was the last country in Asia, and one of only three countries (Angola and Djibouti were the others) worldwide with a 10-year pre-university cycle.

K-to-12 Basic Education

The Republic Act 10533, or the Enhanced Basic Education Act, makes 12 years of basic education for Filipino children compulsory. Primary and secondary education is currently being reformed as part of the "K-to-12" project. Under this program, education will become compulsory for children aged 5–18, which will include one year of kindergarten, six years of primary education, and six years of secondary education. The current "high school" will become "junior high school" (four years) and the new "senior high school" will last for two years (grades 11–12). *A*n estimated 28 million students are in basic education (primary and secondary).

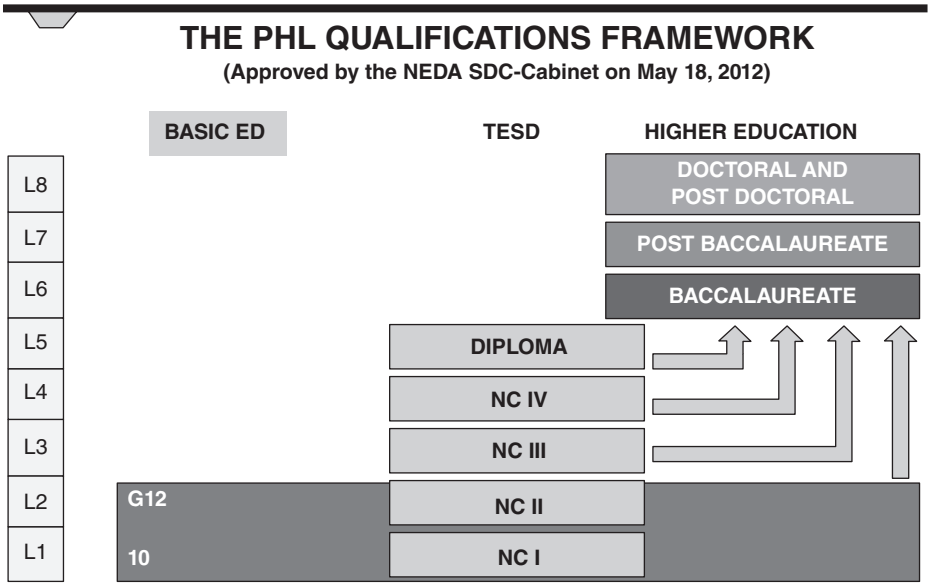


Figure 39.4 The Philippine Qualifications Framework

Source: http://ceap.org.ph/upload/download/20138/2723637531_1.pdf

Higher Education

Higher education in the Philippines is unitary; i.e., higher education institutions (HEIs) such as universities, colleges, academies, institutes, schools offer both vocational and academic/research programs. The system is organized into three stages: bachelor's, master's, and PhD. There are also associate programs. The various degree programs are offered by 2,396 HEIs including the satellite campuses of the SCUs, 112 of these HEIs are funded by the government or state, and 1,710 are private universities. There are about 3.5 million students enrolled in the bachelor's program, and more than 681,000 in the graduate degree programs (http://ched.gov.ph/higher-education-indicators/). The Philippines Higher Education (HE) sector is larger than that of many of its ASEAN neighbors, including Thailand, Vietnam, Indonesia, and Malaysia (British Council, 2017). Figure 39.4 shows the Philippine Qualifications Framework indicating the curriculum under the trifocalized system of education in the country.

In August 2014, the Philippine President signed into law Republic Act 10931, or the Universal Access to Quality Tertiary Education Act. The Act provides free tuition and other financial assistance to those who qualify for admission and enroll in state or local universities and colleges, and state-run technical-vocational institutions.

Historical Perspective of Distance Education in the Philippines

Librero (2015) traced the beginnings of distance education in the Philippines to the radio program "Farmers School" designed to "teach farmers in Iloilo province and the Central Philippines modern farming techniques. The program, which was conceptualized, produced, and broadcast by Pacifico Sudario, had its first broadcast in 1952. Another initiative which used radio for education was the School on the Air (SOA) started in 1967 by Radyo DZLB, a 250-watt radio station operated by the University of the Philippines Los Banos. There were five objectives of SOA which

differentiated it from the usual radio programs providing educational information to its listeners. These are:

1. The SOA has a well-defined set of instructional objectives.
2. The SOA must be well-planned.
3. The SOA should deal with only one major subject matter at any given time. That is, one major topic for each "school broadcast period," which may last anywhere from one month to three months.
4. The SOA should present the subject matter in a progressive manner, according to learning principles.
5. The SOA should be a cooperative undertaking among appropriate agencies since the radio station cannot do it alone.

The radio "School on the Air" was followed by another initiative by the University of the Philippines Los Banos. This was the STUDI project, which stands for Upgrading Science Teaching Using Distance Instruction, which, as the term implies, focused on secondary school teachers teaching biology, mathematics, physics, and chemistry. The idea was to address the lack of training of science teachers in the country without having to pull them out from their work. The implementation of this project was based on the distance education model; that is, course packages were prepared ahead of time using the team approach and lessons were delivered through various platforms. During course development, the subject expert was assisted by media consultants, specifically radio program writers and instructionally text/printed modules were supplemented with 30-minute radio broadcasts titled "Science Encounters" aired over Radyo DZLB. The radio component as a delivery method very much reflects the influence of the earlier model of distance education in the country, the School on the Air. The other feature of the early distance education initiatives in the Philippines was once-a-month study sessions in a study center.

Successful implementation of the STUDI project caused the University of the Philippines (UP), the only national university in the country, to seriously look at its distance education program, with a focus on maintaining the quality of education and tradition of excellence which had become the trademark of the university. Hence, in 1992, the Distance Education Program was formally put in place through the decision by the UP Board of Regents. The program was to focus on teacher training, applied computing, and public administration. Even at this early stage of distance education in the Philippines, consideration in the choice of subject areas centered on which profession or sector needed continuous professional development and would create greatest public impact. It should also be noted that teacher training was still at the core of the mission of distance education. These three initiatives—School of the Air, STUDI, and the Distance Education Program—became the precursors which led to the establishment of the University of the Philippines Open University in 1995.

Current Distance Education Initiatives

Distance education initiatives in the Philippines are undertaken at the various levels of education with alignment to the Philippine Qualifications Framework. Hence, there are distance education programs at the secondary school level, higher education level, and technical-vocational level. These distance education initiatives combined would be able to catch those who are not part of the formal school system and are unable to attend the conventional/residential mode of instruction due to various reasons and constraints.

For higher education, in addition to UPOU, the Commission on Higher Education has listed 35 higher education institutions offering distance and transnational education. These institutions

employ different models of distance education which range from print materials supplemented with face-to-face study sessions to fully online mode without any face-to-face sessions at all.

For secondary education, there is the Open High School Program (OHSP) of the Department of Education (DEPED), which was put in place as an alternative mode of formal secondary education program to provide an opportunity for elementary graduates and high school dropouts to complete secondary education in a purely distance learning mode (http://opinion.inquirer.net/16269/deped-creates-internet-based-distance-education-program#ixzz5HR0IaZt8). The OHSP was first implemented in 1998 as a drop-out reduction program of DEPED.

In 2014, Republic Act 10665, also known as the Open High School System Act, was signed to address the increasing dropout rates at the secondary education level which was recorded at 12.51% during the school year 2006–2007. This law became the Department of Education's "last mile" strategy to bring schools to where the learners are. In 2016, there were around 19,600 students in 13,571 public secondary schools under the OHSP (Dela Peña Bandalaria, 2016). Dela Peña Bandalaria (2016) further described the OHSP program implementation as follows:

- Open registration schedule.
- Free distribution of modules which enable more learners to be part of the program.
- Once-a-week face-to-face meetings to give students the opportunity to clarify lessons.
- Instructional strategies include Web-based instruction; work-oriented approach; process-oriented method; media assisted learning; flexible or blended learning; and group or cooperative learning, distance learning, individualized instruction, and face-to-face guided instruction.

Regarding outcomes of the program, Dela Peña Bandalaria (2016) gave the following observations:

> A comparison of the final grades of all students in five subjects (English, Filipino, mathematics, science, and social studies) showed that OHSP students were not inferior to their counterparts in the regular education programme. The academic performance of OHSP students in the National Capital Region and those in the provinces were comparable. Schools surveyed reported that most of their OHSP graduates entered colleges and universities after completing the programme.

Bandalaria (2016) further noted that for OHSP, the following are the areas for program improvement to realize its vision: sufficiency and quality of learning materials, more learning facilities, financial support for the various components of the program, and capacity building for teachers.

The focus on teacher training through distance education is also reflected by the initiatives of other organizations and academic institutions. One such initiative is the SEAMEO INNOTECH "Gearing Up Responsible and Outstanding Teachers in Southeast Asia for the 21st Century," or GURO21, which aimed at providing short modules to teachers delivered through the flexible mode of instructional delivery; that is, online supplemented with face-to-face sessions. The University of the Philippines National Institute for Science and Mathematics Education Development (NISMED), on the other hand, conducts its Continuing Science Education for Teachers (CONSTEL) project via television.

For the technical-vocational education, TESDA—through its TESDA Online Program (TOP or eTESDA)—offers more than 40 online courses for free with the goal of making development and technical education a lot more accessible to applicants. This program caters to fellow Filipinos who would like to enhance their skills and knowledge technically whether they are professionals, laborers, unemployed, out of school youths, students, and even those who work overseas (OFWs) upgraded.

From 1952 to the present, distance education initiatives in the Philippines can be organized into four generations, as influenced and shaped by the predominant information and communication technologies being used:

- **First-Generation Distance Education:** Administered through radio and the School on the Air program.
- **Second-Generation Distance Education:** Relied mostly on print-based instructional materials supplemented with occasional face-to-face tutorials in university-designated learning centers and facilitated by a university-trained tutor.
- **Third-Generation Distance Education:** Characterized by the convergence of various ICTs to deliver instructional content and learner support services. While the printed modules remained the main mode of delivering instructional content, they were supplemented with audio and video materials containing lessons best delivered through these formats. The study session was through teleconferences, facilitated by one tutor. The Third-Generation DE can be seen as an action to respond to several key factors: (a) growing need for flexible learning anytime, anywhere; (b) increased availability and access to new ICT; and (c) growing demand of geographically dispersed professional groups seeking access to flexible, lifelong learning opportunities.
- **Fourth-Generation Distance Education:** can be aptly described using the terms e-learning (electronic learning), mlearning (mobile learning), and u-learning (ubiquitous learning). Distance e-learning (DeL), or online learning, has become the dominant feature of this generation.

The Open Distance E-learning (ODeL) as the Emergent Framework

In a reflection on how distance education is being implemented in the Philippines, and to aptly describe it, an open distance e-learning framework has emerged, and was first articulated by Alfonso (2014), who described the term ODeL as follows:

> ODeL draws from the features and affordances provided by open learning, DE, and e-learning—access and equity, resource sharing, learner-centeredness, flexibility, active learning, interactivity, ubiquity, and connectivity. Some of these features—like access and equity—are more in tune with open learning. Others—like learner-centeredness, flexibility, and active learning—are shared by the three domains. Ubiquity, interactivity, and connectivity are more of e-learning's contributions.

The Adoption of the MOOCs Framework for Sustainable Development (MOOCs4SD)

The framework of the massive open online course (MOOC) was adopted in the Philippines in 2013 as a platform for the following purposes:

- Provide quality open education opportunities to those who could not study because of financial constraints.
- Bridge the gaps between the knowledge and skills possessed by school leavers (graduates and school dropouts) and the needs of industries.
- Provide continuing professional development for teachers and other professionals.
- Provide open educational resources to improve the quality of education in the country under the model "MOOCs as OERs" in blended teaching and learning instruction.

Two government institutions adopted this framework—the University of the Philippines Open University (UPOU), which started this initiative in 2013, and the Technical Education and Skills

Development Authority (TESDA), which followed suit in 2015. The MOOC framework was also seen in the Philippines as a mechanism to address unemployment in the country which stood at 5.4% in 2016 (Dela Peña Bandalaria, 2016). Further, Dela Peña Bandalaria and Alfonso (2015) described the Philippines adoption of the MOOC Framework as follows:

> In the Philippines, the specific discourse on openness in education and involvement in areas of openness such as MOOCs revolves around three interrelated issues: (1) access, (2) quality, and (3) transnational education.
>
> *(p. 246)*

To date, UPOU has developed and offered 47 MOOCs, and 27 more new MOOCs are scheduled for offering from 2018 up to early 2019. TESDA, on the other hand, has listed more than 40 free online courses and has recorded about 170,000 enrollees from all over the world.

SEAMEO-INNOTECH also launched its MOOC titled Igniting Passion for Teaching in July 2017. This MOOC aims to inspire and build the capacity of teachers and educators of Southeast Asia (www.facebook.com/SEAMEOINNOTECH/posts/1386096314818548).

The Philippine MOOCs model (PhMOOC) has been positioned to address concerns that have a bearing on the country's development such as skilling and reskilling its workforce resources, including the continuing professional development of teachers, and a mechanism to make available quality instructional content and thus improve the quality of education in the country. The PhMOOCs can also be considered as an initiative to foaster inclusive lifelong learners and thus contribute to the fourth goal in the framework mentioned in the beginning of this section. With regard to the other SDGs, the PhMOOCs are designed to be at the core of each SDG under the construct that education is essential for the attainment of all SDGs.

Republic Act 10650

The adoption of distance education to further democratize (and even open) access to quality tertiary education was further strengthened with the signing of Republic Act 10650, also known as Open Distance Learning Act in 2014. The law specifically looked at the "promotion and application of open learning as a philosophy of access to open educational services and the use of distance education as an appropriate, efficient and effective system of delivering quality higher education and technical education services in the country" (https://senate.gov.ph/republic_acts/ra%2010650.pdf). The law also directs both the Commission of the Higher Education of the Philippines (CHED) and TESDA to spearhead its implementation, with technical assistance from UPOU. Other provisions of the law include tax exemption for all donations to open distance learning institutions in the country, establishment of "zonal open distance learning centers" in Metropolitan Manila, Luzon, Visayas, and Mindanao—which will help the CHED and TESDA in performing their tasks in connection with alternative learning—and for broadcast media and telecommunication networks to provide assistance and cooperation to universities and colleges offering open distance learning programs.

The University of the Philippines Open University (UPOU)

The UPOU is the first and only open university in the Philippines to offer degree and non-degree programs in the full distance e-learning mode. It was established in 1995 as the 5th Constituent Unit of the University of the Philippines System, the premier and only national university of the country. UPOU's vision is "to be at the forefront of the knowledge society as the leading institution of open learning and distance education." The university seeks to "provide wider access to quality higher education; adhere to the highest standards of academic excellence; guarantee academic freedom; and

encourage social responsibility and nationalistic commitment among its faculty, staff and students" (http://old.upou.edu.ph/index.php?option=com_content&view=article&id=4&Itemid=130).

UPOU started implementing its distance education programs using the combination of the printed modules and once-a-month study sessions in University Learning Centers facilitated by tutors trained by the university. In 2001, UPOU started offering its courses in the distance e-learning/online mode by making tutorial sessions available through a learning management system. In 2007, the university became fully online with all its course materials digitized and academic activities conducted through a learning management system. These academic activities include delivering instructional content, academic interactions, and assessment of learning. The courses were designed to facilitate the academic interactions deemed essential to lead to meaningful learning. These interactions are: learner-teacher interaction; learner-learner interaction; learner-content interaction; and learner-community of practice interaction.

UPOU currently offers 32 degree programs and a number of non-degree/non-formal programs. It should be noted that all of these degree programs have a set of admission requirements which applicants need to satisfy before they can be admitted into the program in which they wish to enroll. For the undergraduate program, for instance, admission requirements include passing an admission exam or qualifying for transfer with required general weighted average (GWA) for the required number of units. For the graduate programs, the admission requirements include passing an admission examination and satisfying the required GWA for the previous degree program completed (e.g., bachelor's degree GWA for those applying to the master's programs and GWA for the master's degree for those applying to the doctoral program). Accreditation of prior learning (APL) comes in two forms: transfer of credits for the courses previously taken that are more or less 90% similar to the courses under the program at UPOU, and advance placement for those who believe they have sufficient knowledge and skills covered in a course that they need to take under the degree program they enrolled in at UPOU. UPOU also follows two academic calendars: the semester (two semesters and one midyear term), and trimester (three terms per academic year of 10–12 weeks each term). These academic calendars set a specific schedule for university activities including enrollment and exams. All facts considered, it can be said that UPOU is a distance education institution which is not open when it comes to admission and study schedule. UPOU also offers ten non-formal courses and 44 MOOCs.

For the school year 2017–2018, UPOU has a total program enrollment of 8,360. Twenty-five percent of the student population is based outside the country—in approximately 60 locations all over the world.

UPOU's Massive Open Online Courses and Other Open Education Practices

As a state university, one of the core functions of UPOU is public service. Likewise, UPOU also positioned itself as a research university with the expectations that it will contribute to the building of knowledge not only in the disciplines covered by the degree programs that it offers but also in the field of open and distance e-learning. Hence, in 2013, the university engaged in the development of MOOCs, which was aligned with its public service function. This initiative also provided an opportunity to do research on this open education practice and contribute to the further development and construction of theories in the field of distance education. Romualdo (2017), in her write-up about the UPOU MOOCs, described the UPOU's MOOC journey as follows:

> UPOU Chancellor Melinda Bandalaria recalled that it was in 2011 when the idea of offering MOOCs was "crystallized with the conceptualization and implementation of the

uLearn project." UPOU had already been offering online courses for ten years; for four of those years, the courses were offered completely online. MOOCs were the next logical step.

UPOU also developed its model of MOOCs called MODeL, or Massive Open Distance e-learning, with the following features:

1. The MOOC is also an Open Educational Resource (OER), meaning all materials, including the learning platform, used in the course are all OERs.
2. Course material development follows the quality circle approach that the university has adopted for its degree/credit courses.
3. Certification of MOOC completion is assessment-driven.
4. One-time completion of a distance education readiness module is required before one can enroll in a MOOC.
5. The MOOC is positioned to achieve a specific objective that is aligned with the mandate of the university, e.g., free online training of teachers on a specific subject area like fundamentals of business analytics.

In 2018, UPOU started offering the following MOOC/MODeL Certification Programs:

- Open Distance e-learning (ODeL) Certification Program
- Child Rights Protection and Promotion Certification Program
- Technology for Teaching and Learning
- Service Management Program (SMP) Certification Program

The number of courses for each category for the 44 MOOCs are classified as below:

ASEAN Studies	1
Child Rights Protection Promotion	8
eFilipiniana	6
eService Management Program	15
Interlocal Cooperation (for Local Government Units	1
Open Distance e-learning	9
Sustainable Development	1
Technology for Teaching and Learning	3

Twenty-seven more MOOCs on business analytics are lined up for offering on the later part of 2018 to 2019.

In 2016, UPOU has crafted its three-year development plan (2016–2019), which has served as the blueprint for the programs and initiatives that the university is undertaking.

With these initiatives, it can be said that the UP Open University has maximized the potential of distance education and the affordances of modern information and communication technologies to perform its mandate to develop the Filipino human resources and other lifelong learners all over the world.

Conclusion

This chapter presented the distance education initiatives of the two biggest archipelagos of the world: Indonesia and Philippines. The cases presented showed how distance education, as a mode of instructional delivery, has been situated in the educational context of the respective countries, and how the

two open universities operating in the respective countries concretized the concepts and principles of open and distance education to contribute to the national development.

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