

Theories of Teaching and Learning

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There is a close relationship between theories of teaching and theories of learning, although it is not a simple matter to give it adequate characterization. Many contemporary authorities see teaching (that is, good or effective teaching) as being parasitic upon some theory of learning. Bruce Joyce and his co-authors, in the most recent edition of a text widely used in teacher-training, *Models of Teaching*, write that "The models of teaching described in this book come from beliefs about the nature of human beings and how they learn" (Joyce et al., 2000, p. 29), and a National Research Council (NRC) report in the USA in 1999 explicitly sees "advances in research on human cognition, development, and learning" as ideally driving educational practice (NRC, 1999, p.2). However, it seems clear that this simple account will not quite suffice. Two complexities are mentioned here by way of introduction to the main discussion.

First, as William James so eloquently pointed out in 1899, "to know psychology" (of learning, for example) "is absolutely no guarantee that we shall be good teachers" (James, 1958, p. 24). As he said,

you make a great, a very great mistake, if you think that psychology, being the science of the mind's laws, is something from which you can deduce definite programmes and schemes and methods of instruction for immediate schoolroom use. Psychology is a science, and teaching is an art; and sciences never generate arts directly out of themselves. An intermediary inventive mind must make the application, by using its originality. (James, 1958, pp. 23-4)

In our contemporary world, echoes of James can be found in the work of philosophers of education such as Gary Fenstermacher and David Carr, who stress that practical reasoning – which cannot be reduced to following rules or applying theories – plays a central role in the thinking of effective teachers (Fenstermacher, 1986; Carr, 2000).

Another complexity arises from the fact that teaching very often takes place in institutions (schools, colleges, churches, families), and thus to some degree is shaped in its goals and methods by institutional demands. To the extent that these institutional demands are legitimate, they complicate and in some sense loosen the relationship between learning theory and good teaching.

These complications notwithstanding, the focus of this chapter is the teaching and learning of academic subjects, the relationship between teaching and such learning,

and how views about the former have changed as understanding of the nature of the latter has progressed. It will be useful to open with a limited discussion of the influential views of Plato, John Locke, and Jean-Jacques Rousseau, before focusing on selected theories of learning and teaching that have attained prominence during the past century.

Classic Theories of Teaching and Learning

Plato and the Socratic method

Plato's dialogues offer several images of learning and teaching, most famously their various illustrations of Socratic questioning on the one hand, and of ascent to apprehension of transcendental objects of knowledge, the "Forms," on the other.

The *Apology* offers what was apparently Socrates' own understanding of the function of what we now call the *elenchus* or *elenctic* questioning, a method of instruction whose aim is to lead an interlocutor to see the inconsistencies or contradictions in his own beliefs. Socrates understood the purpose of this to be to purge the one questioned of false beliefs – above all, the mistaken belief that he already possessed knowledge or wisdom. Although several early dialogues illustrate the employment of the *elenchus* as a method of testing proposed definitions of various virtues, definitions which Socrates apparently regarded as the key to acquiring the moral knowledge he lacked, no adequate definitions are ever reached. It remains unclear how the *elenchus* could suffice in itself to distinguish truth from error, let alone yield knowledge. Plato displays its limitations in *Republic* I and abandons it thereafter (Reeve, 1988, chapter 1). (For discussions of teaching through Socratic questioning and dialogue see Scheffler, 1967; Lipman, 1988, 1991; Haroutunian-Gordon, 1991; Burbules, 1993; Reich, 1998.)

The *Meno*, with its much discussed questioning of the slave boy, shows Socratic method in a new light. In these pages (82a–86b), Plato depicts Socrates interrogating a boy untutored in mathematics about a form of the Pythagorean theorem, leading him to the correct conclusion through questions, while telling him nothing directly. This episode, prefaced by the announcement of a theory of learning as recollection of perceptions gathered in another life – a theory predicated on a belief in immortality and transmigration of the human soul – suggests the view that effective teaching acts as a stimulus to recollection or conscious recognition of what a learner already in some sense knows.

This model of teacherless learning (Woodruff, 1998) is evidently more Platonic than Socratic in its adoption of mathematics as a model of knowledge, and its optimism about the possibility of human beings acquiring knowledge. Socrates displayed no such optimism, and there is little reason to assume that he asserted his own ignorance merely as a pedagogical stance. By contrast, Plato develops in the *Republic* an account of the philosopher as one whose desire for wisdom, training in the abstract sciences, and sustained practice of dialectical inquiry may enable him or her to acquire knowledge – a knowledge of *reality*, as opposed to mere true beliefs about the world of *appearances*. He explicates this concept of learning through various

analogies: the *line* (of ascent from opinion to knowledge; 509d–511e), the *sun* (an image of the “Form of the Good” as highest object of knowledge and “cause of all that is correct and beautiful in anything”; 517b, 507a–509c), and the *cave* (514a–519b). The point of Plato’s famous allegory of the cave, in which prisoners in a cave can see only shadows of imitations of reality, is that education is not “putting knowledge into souls” (518b), but the craft of turning a person’s desires away from bodily appetites and status-seeking toward the deeper pleasures of learning or contemplation (hence, an art of turning “the whole body” (518c) or “soul” (518d)). To teach, then, is not to transmit knowledge, but to lead students to search for it. Plato conceived of the culmination of that search, when successful, as “understanding,” an intellectual perception or apprehension of the “Forms” or first principles of all knowledge.

Locke, associationism, and object lessons

John Locke, one of the great early figures in the school of British empiricism, also occupies an important place in the history of educational thought. In a variety of ways he influenced how learning and teaching were conceived by many educationists from the late eighteenth to the early twentieth centuries, and even beyond. The influential aspect of Locke’s philosophy, so far as the theme of this chapter is concerned, is his line of argument that all “simple ideas” (the building blocks of “human understanding”) originate in experience: either “external” experience that comes to a person via “sensation” through the sense organs, or “internal” experience obtained by “reflection”; the ideas of “yellowness,” “hardness,” “extension” come via the senses, while “pain” and “concentration” come from reflection. Simple ideas can be combined in various ways, or can be abstracted, to form “complex ideas,” but an individual cannot invent or acquire simple ideas for which he or she has not had the requisite experience, nor any complex ideas of which those simple ideas are parts. Once the “understanding” is “furnished” with ideas, it can grasp relationships between various ideas or come to *know* things, through immediate apprehension of such relationships and through following out chains of reasoning (Locke, 1975, Book IV; 1996, pp. 169–81).

Locke’s “sensationalism” helped to establish the educational principle that children need to have a solid background of experience upon which their formal education can draw; without experience, at best they will learn words but will not have mastery of the underlying concepts. Along these lines, educators in the late nineteenth century started to grapple with the following types of cases: children living in remote inland areas might learn the word “sea,” but they are unlikely to acquire the concept of the sea as an entity if they have not experienced it; similarly, many city-dwelling children will have no real concept of the farm animals they have met only in picture books. In the last few decades of the twentieth century a similar realization underlay the development of the television series *Sesame Street*, which tries to give pre-school children a stock of ideas and experiences that can underwrite their learning when they enter the early elementary grades. (For further discussion of Locke’s influence, see Cleverley and Phillips, 1986, chapter 2; Phillips and Soltis, 1998, pp. 13–19.)

Sometime in the late eighteenth century an educational practice emerged that was justified in Lockean terms; first espoused by the Swiss educational reformer Johann

Pestalozzi (1746–1827), so-called “object lessons” were a form of training of the senses that were widely used in the emerging elementary school systems throughout Europe and the United States. The idea was that, over time, the teacher would lead students through a graded series of lessons in which they carefully observed the qualities of objects presented to them. Many textbooks were published describing object lessons in detail, down to the precise series of questions the teacher should ask.

Object lessons bear a family resemblance to the sense training regimens adopted later in Montessori schools. Like her contemporaries Jean Piaget and John Dewey, Maria Montessori (1870–1952) objected to the passive, absorptive view of children that was implicit in the work of what she called “mechanistic psychologists” (presumably the associationists). She wrote that according to their theory of knowledge “the impressions which we receive from external objects knock upon and, as it were, force the gates of our senses.” The child is treated as an “empty vase” waiting to be filled – apparently a reference to Locke’s work which used the analogy of “furnishing” an empty cabinet (Montessori, 1972, p. 60). According to her own theory, the child is an active and insatiable reasoner; but she also stressed that young children pass through a sensitive period in which they assimilate images from the environment “in a truly prodigious fashion.” Having, as she put it, a “more rational esteem” for the child’s sensations than did other schemes of education, she was concerned that the child not be overwhelmed. Thus, she designed the strict regimen of sensory exercises that were used in her schools to allow the child to carefully discriminate between sensations, and to systematically order and “pigeonhole” them.

Rousseau and later “progressive educators”

Jean-Jacques Rousseau’s book *Émile* (1762) stands as the foundation stone of the modern progressive education movement; it was a book that inspired many, and infuriated probably an equal number. Written to be read in conjunction with Rousseau’s political treatise, *The Social Contract* (1762), it makes a graphic case for educational principles illustrated by incidents in the early life of the book’s hero. *Émile* is a young boy whose family arranges for him to be educated on an estate in the country away from the harmful influence of contemporary civilization, which Rousseau decries in his opening sentence: “Everything is good as it leaves the hands of the Author of things; everything degenerates in the hands of man” (Rousseau, 1979, p. 37). Not surprisingly, then, the boy is given a “natural” education, one conducted in a “natural” (i.e. not urban) setting and intended to preserve his “natural” (i.e. innate or God given) goodness and freedom, and the book traces his progress from early childhood to manhood and marriage. Rousseau stresses that in all things *Émile* should be free from artificial restraint; he should be as free as nature intended him to be, and should only feel the “harsh yoke which nature imposes upon man, the heavy yoke of necessity,” and should not suffer “the caprice of men” (p. 91).

Young *Émile*’s education is in the hands of a tutor, and it does not take a perspicuous reader to notice how directive and manipulative the tutor is or how unnatural, in one sense, the whole set-up is. Rousseau envisions an education that is “according to nature” in the two senses noted above, but also in the sense that it follows the sequence and timing of *Émile*’s “natural” or internally determined stages of

intellectual and moral development: his progress from being moved by pleasure and pain and sharpening his senses, to grasping what is useful and reasoning instrumentally, to being moved by reason and discovering all that "natural reason" may reveal. This belief that the natural development of children occurs in stages was later adopted and developed by others, most famously by Rousseau's fellow Genevan Jean Piaget in the twentieth century, and suggests that for teaching to be effective it must match the material to be taught to the child's stage of development (see Phillips and Soltis, 1998, chapter 5).

Another sense in which Rousseau considers Émile's education "natural" is that he learns through discovery and the largely spontaneous exercise of his own faculties, motivated and moved along from one topic to another by his own curiosity. The tutor is to teach Émile nothing, but instead ask leading questions and contrive experiences which will increase the efficiency and frequency of the lessons Émile will draw from his experiences and the "natural" consequences of his actions. The consequences may be physical (if he breaks a window, he will not be protected from the cold), but also social. This is illustrated repeatedly, perhaps most importantly through a cleverly contrived lesson in the sanctity of property and its origins in labor, in which Émile both suffers the destruction of the beans he has cultivated and learns that he has inadvertently destroyed melons which had already been sown in the plot he has tried to make his own (pp. 98–9), and a lesson in magnetism and the perils of pride, in which his vanity leads (naturally) to public humiliation (pp. 172–5). Rousseau seems to conceive of these experiences as ones in which Émile acquires moral concepts and an intuitive grasp of moral laws, and they run parallel to Émile's discovery of the laws of nature. "Let him not learn science, but discover it. If ever you substitute in his mind authority for reason, he will no longer reason," we read in Book III (p. 168). Accordingly, Émile's tutor sets him a question, "I was thinking that yesterday evening the sun set here and that this morning it rose there. How is that possible?" and leaves him "to worry over it for a few days before he discovers it" (p. 169). Rousseau suggests that after some thought and observations Émile learns Ptolemaic astronomy for himself and, even more implausibly, that "Copernican astronomy will follow when he himself makes the observations which lead to it" (p. 486, n1). Other examples of envisioned discovery learning of scientific phenomena, laws, and explanatory models, are equally oblivious to the role in science of mathematics and exact observation, and trade on a spurious equation of scientific concepts and reasoning with concepts obtained directly from experience and "natural" reasoning.

There is an obvious link here to the "discovery learning" practiced by many of the so-called progressive educators of the twentieth century, which again hinged upon the negative idea that the teacher should not attempt to impose knowledge upon students but should arrange for them to inquire for themselves. This approach assumes that children *can* inquire meaningfully in a variety of subject domains; but for many educational theorists of the twentieth century – including Dewey and the constructivists – the issue of how much a teacher should actually *tell* her students remained a pressing one.

The progressives had much in common with Rousseau; perhaps most obviously in the case of A. S. Neill, headmaster of Britain's most famous "free school," Summerhill, which flourished during the last seven decades or so of the twentieth century. "My

view is that the child is innately wise and realistic. If left to himself without adult suggestion of any kind, he will develop as far as he is capable of developing," wrote Neill (1960, p. 4). Borrowing liberally from Freud as well as Rousseau, Neill held that freedom is also therapeutic, and allows children to shed the inhibitions and life-hating attitudes that they acquire through bad parenting or from previous inadequate schooling. At Summerhill, attendance at classes was voluntary and the lessons seemed to be taught in a fairly traditional manner; Neill believed that when students decided that they wanted to learn, they would decide to come to classes and they would master the academic content easily, almost irrespective of how it was taught. Above all, like Rousseau, he trusted children and had faith that they were naturally good and self-regulating.

John Dewey's Theory of Learning and Teaching

There is little doubt that John Dewey was the most influential progressive educational theorist and philosopher of education in North America during the twentieth century. Dewey's conversion to pragmatism and away from Hegel dates to his reading of William James's landmark book *The Principles of Psychology* shortly after its publication in 1890, and it was from this source (and later shorter popularizations) that Dewey's theory of learning was largely acquired.

It is significant that the chapter of Dewey's small book *The School and Society* (1902) that discusses the "psychology of elementary education" bears remarkable similarity to passages in James's popular *Talks to Teachers on Psychology* (1899). James and Dewey both adopted an evolutionary approach to learning, in which the human capacity to think and to learn was seen as an adaptive feature that promoted survival by allowing actions to be guided by reason and experience. As James summarized it,

I shall ask you now . . . to adopt with me, in this course of lectures, the biological conception, as thus expressed, and to lay your own emphasis on the fact that man, whatever else he may be, is primarily a practical being, whose mind is given him to aid in adapting him to this world's life. (James, 1958, p. 34)

From this biological perspective a learner should be active, both mentally and physically, and be engaged with material that is of direct (and preferably practical) relevance. In *Democracy and Education* (1916) Dewey wrote that

The effect [of evolutionary theory] upon the theory of knowing is to displace the notion that it is the activity of a mere onlooker or spectator of the world. . . . For the doctrine of organic development means that the living creature is a part of the world, sharing its vicissitudes and fortunes. (Dewey, 1966, p. 337)

This led Dewey to be a particularly severe critic of what he called the "spectator theory of knowing," in which the learner was depicted as a passive receptacle or spectator. Indeed, he argued that all classic epistemologies were spectator theories: not only empiricist theories, but even Plato's, his conception of the intellectual

activity required to attain knowledge notwithstanding. All were guilty of believing that knowledge could be attained without acting in the world to affect the object that was to become known; as Dewey went to great lengths to explain in 1929 in his *The Quest for Certainty*, the spectator theorists as he understood them treated the object of knowledge as fixed and antecedent to inquiry (Dewey, 1988). He stressed that not only evolutionary biology, but also the development of the experimental method, had made the defects of the spectator theory apparent. (This crucial aspect of Dewey's work remains controversial; see Kulp, 1992.)

Dewey's pragmatic epistemology was, in his view, directly related to education, for he regarded philosophy as "the general theory of education" (Dewey, 1966, p. 328). It was on the basis of his biological, experimental approach to epistemology that he advocated the use of activity and discovery methods, and projects, in the classroom. Just how far Dewey regarded contemporary schooling as falling short of the ideal espoused by James and himself is revealed in this evocative passage:

Just as the biologist can take a bone or two and reconstruct the whole animal, so, if we put before the mind's eye the ordinary schoolroom, with its rows of ugly desks placed in geometrical order, crowded together so that there shall be as little moving room as possible . . . and add a table, some chairs, the bare walls, and possibly a few pictures, we can reconstruct the only educational activity that can possibly go on in such a place. It is all made "for listening." (Dewey, 1969, p. 31)

In sum, then, Dewey wanted students to be active inquirers, working on problems that were genuine problems for them (rather than being merely problems the teacher had imposed); and it is important to add that he also saw the classroom as a community.

There are points of close contact between Dewey's work, as just outlined, and two extremely influential models of teaching that emerged in the late twentieth century. The first of these needs a little by way of introduction. It would be a misapprehension to think that Dewey advocated allowing the students to do whatever they pleased (this, in his view, was one of the failings of the more radical progressive educators); schools had the responsibility of ensuring that students were acquainted with what he sometimes termed "the funded wisdom of the human race" – the wisdom that was embodied in the curriculum. But (like Émile's tutor) the teacher would not impose material on the students; instead, the teacher's role was that of a resource, a facilitator (or, in the contemporary euphemism, an "instructional leader"). In *The Child and the Curriculum* he argued that the teacher needed to be a *psychologizer* of subject-matter, taking the material that was in the curriculum and ordering it (and arranging for the students' interaction with it) in such a way that it was appropriate to their current concerns and to their present developmental and psychological state (Dewey, 1969).

This aspect of Dewey's work served as inspiration to the contemporary educational theorist Lee Shulman, who was one of the strongest advocates in the USA in the late twentieth century for the professionalization of teaching. Shulman sees the teacher's role very much as Dewey saw it, and he revived interest in the field of "psychology of subject matter." Shulman suggested that, in order to be able to psychologize the subject matter or content of teaching, the teacher needs to have a different understanding of it than that which is possessed by scholars expert in the same material. Teachers need to have the material mentally ordered for pedagogical (rather

than for “logical”) purposes. They need to understand which topics are educationally central, in the sense that if a student does not grasp them, mislearning of the subject will occur. They need to be able to anticipate misconceptions that are likely to hamper student learning of the content. They need to know what topics students are likely to have problems grasping, and they need to have examples, analogies, and learning strategies available that are tailored for these difficult topics. Shulman called all this “pedagogical content knowledge” or “subject matter knowledge for teaching” (Shulman, 1986, 1987). Following Shulman’s suggestions, researchers are now actively investigating the learning of school subjects, especially mathematics, science, history, and literature.

The second point of contact between Dewey and contemporary theories of teaching and learning lies in the fact that Dewey was a major contributor to the modern constructivist movement, in the sense that he stressed that when teachers attempt to transfer knowledge to their students this will be “cold storage knowledge” unless the students are active in using it in application “to their own purposes” (Dewey, 1966, p. 158). In short, for Dewey learning is an activity (physical as well as intellectual) engaged in by students, not an absorptive or even purely intellectual process.

In the years after Dewey’s death the term “constructivist” came to have a variety of meanings and came to cover an extraordinary range of psychologists, philosophers, and educational theorists. As a consequence it is probably best to think of the word in terms of a set of Wittgensteinian “family resemblances” – various usages might have very little in common. It is worth departing from the historical sequence of the chapter at this point to discuss this movement in more detail.

Contemporary Constructivist Theories of Teaching and Learning

To bring some order to the vast spectrum of “constructivist” positions, it is useful to think in terms of several strands or themes. In the first place there are two quite different (but not completely discrete) foci of interest in contemporary constructivism: many constructivists have as their interest individual learners (such things as the psychological mechanisms that play a role in their learning, and to what degree social factors contribute); other constructivists focus upon the way in which the public bodies of knowledge (disciplines such as the sciences, mathematics, economics, history) are “socially constructed.” This latter group played a prominent role in the so-called “science wars” of the 1990s, but will not concern us here. The former group (sometimes called the “individual or psychological constructivists”), with acknowledged influences reaching back into the past (to Vico, Kant, and Rousseau, for example, and also Plato and Locke), include in the twentieth century Jean Piaget, Lev Vygotsky, Maria Montessori, John Dewey, and Ernst von Glasersfeld (Phillips, 1995, 2000). These constructivists differ among themselves with respect to the mechanisms that they see at work in the learner. Piaget had a strong tendency to depict the young child as a solitary enquirer in which the biological processes of assimilation, accommodation, and equilibration were centrally important, and in his massive oeuvre he only devoted a little space to the discussion of social factors. Vygotsky, on the other hand, criticized this aspect of Piaget’s work, and stressed the

role of parents, teachers, peers, and the cultural milieu – this position being nicely encapsulated in his concept of the “zone of proximal development,” the “zone” in which children develop with the assistance of others, rather than by relying on their own independent efforts (Phillips and Soltis, 1998).

The second major focus of constructivism is arguably the central one, however, for it is this that many constructivists take as fundamental to their position: if one considers a continuum with respect to knowledge from “humans the creators” to “nature the instructor,” constructivists deny that nature serves as an instructor or template that the knower merely “copies” or absorbs, and they hold that there is a sense in which knowledge is made, not discovered (Phillips, 1995, 2000). More generally, they deny that individual learners receive knowledge by instruction or transmission from “outside.” It should be apparent – although it has not been apparent to many constructivists writing in the late twentieth century – that there is much need for philosophical refinement here, and it is far from clear which (if any) thinkers are actually ruled out by this element in constructivism. Locke’s sensationalism, for example, clearly seems anti-constructivist, but what happens in his theory after the simple ideas coming from experience have “furnished the understanding” is quite constructivist. Arguably there are both constructivist and anti-constructivist elements in Plato as well, and it is interesting to note that Ernst von Glasersfeld (1991, p. xiv) acknowledges Socrates as a forebear.

The third stream in modern constructivism is that the construction of knowledge is a process involving both physical *and* intellectual activity. Dewey, Piaget, Vygotsky, and von Glasersfeld, among others, are unanimous about this. Many of these theorists give a strong evolutionary justification for this view of learning, along the lines discussed above with respect to Dewey and James.

It is no surprise, then, that constructivist teaching has a strong Deweyan orientation; the constructivist teacher encourages students to be active problem identifiers and solvers, and does not impose ready-made solutions on students but fosters discussion and inquiry. Consequently, constructivist teachers are concerned about how much they need to tell their students, particularly in science and math, where construction of all knowledge by inquiring students does not seem to be realistic. Many, following von Glasersfeld, believe that teachers cannot know how knowledge has actually been constructed by the students, as the minds of other individuals are unknowable (a solipsistic position von Glasersfeld evidently reached on the basis of his reading of the empiricist epistemologists; see Phillips, 2000, pp. 41–85, 161–92). But it is time to return to the mid-twentieth century.

The Contributions of Analytic Philosophy of Education

Analytic philosophy of education (sometimes known as APE) was heavily influenced by the so-called “ordinary language philosophy” practiced in the UK, North America, and Australasia around the middle decades of the twentieth century. The practitioners of APE attempted to clarify the concepts that were central in educational discourse and central, also, to the theme of this chapter, often in the hope that this would eventually lead to advances in educational practice.

Although there was agreement with William James's point that the appropriate activities for a teacher were not fully determined by learning theory, there was some debate as to how tight the conceptual connection was between teaching and learning. Paul Hirst (along with Richard Peters and Israel Scheffler the leading proponent of APE) probably was speaking for the majority when he claimed that there was an extremely tight connection, for teaching always involves the intention that someone will learn (although it is not true that learning always involves teaching). He explicated the relationship as a triadic one:

A teaching activity is the activity of a person, A (the teacher), the intention of which is to bring about an activity (learning), by a person, B (the pupil), the intention of which is to achieve some end-state (e.g. knowing, appreciating) whose object is X (e.g. a belief, attitude, skill). (Hirst, 1974, p. 108)

This analysis entails an "intentionality criterion" for teaching, that a person engaged in the activity of teaching is *trying* to bring about learning. As the literature developed, controversies arose around other putative criteria, notably what came to be called the *criterion of reasonableness*, according to which the activity engaged in must be reasonably calculated to bring about the learning intended (Scheffler, 1960).

Hirst and others also stressed that teaching is a polymorphous activity: a large range of things can count as teaching activities, depending upon the context and on the specific nature of what is being learned. (Learning is also polymorphous, covering a large range of possibilities including facts, generalizations, intellectual skills, practical skills, and so forth.) Teaching, in short, could not be defined in decontextualized behavioral terms, a point of some significance for teacher evaluation (Scheffler, 1960; see also Hamlyn, 1978, chapter 10).

Another line of analysis on which a great deal of effort was expended was trying to clarify the "logical geography" of the family of related terms: "teaching," "instructing," "training," and "indoctrinating." The majority opinion was that, if the first and last of these are considered, there is a falling off in the centrality of appeal to reason. Perhaps this was most clearly expressed, in terms of teaching, by Israel Scheffler:

To teach... is at some points at least to submit oneself to the understanding and independent judgment of the pupil, to his demand for reasons, to his sense of what constitutes an adequate explanation. To teach someone that such and such is the case is not merely to try to get him to believe it: deception, for example, is not a method or mode of teaching. Teaching involves further that, if we try to get the student to believe that such and such is the case, we try also to get him to believe it for reasons that, within the limits of his capacity to grasp, are *our* reasons. Teaching, in this way, requires us to reveal our reasons to the student and, by so doing, to submit them to his evaluation and criticism. (Scheffler, 1960, p. 57)

Contemporary Theories of Learning

In the past few decades there has been much fruitful empirical and theoretical work in the field of learning theory, work that – by and large – has been ignored by philosophers of education. There is a distressing tendency for members of the latter group to

write as if the dominant theory of learning is still the one developed by the classic behaviorists John B. Watson and, more notably, B. F. Skinner. Watson treated learning in terms of classic Pavlovian conditioning, and Skinner, more influenced by the work of E. L. Thorndike, approached learning in terms of operant conditioning. Both thought of learning in terms either of change of behavior or acquisition of new behavioral repertoires. Skinner was able to train rats and pigeons to do remarkable things (he even showed that the latter could steer a guided missile), and he also developed the so-called "teaching machine" (programmed learning) via which a student giving the correct response to a question was reinforced by immediately being informed that the answer was, indeed, correct. However, the work of Chomsky and the rise of modern cognitive psychology pushed Skinner's approach to the sidelines, and philosophers of education were extremely critical of his dismissal of "understanding" and his related refusal to consider learning as a rational activity of the kind so clearly described in the passage by Scheffler quoted above. (For further discussion, see Cleverley and Phillips, 1986, chapter 8; Phillips and Soltis, 1998, chapter 3.)

Three main lines of theory and research have tended to dominate in the last few decades of the twentieth century and the beginning of the twenty-first. One has been the work on cognitive development inspired initially by Piaget, to which Vygotsky's influence was added as his work became translated from its original Russian. The second has been the rapid rise of computer science and the interdisciplinary field of *cognitive science* it has inspired and facilitated. It has become natural to think of human cognition as analogous to automated information processing, indeed as different from such processing only in being executed by biological "wetware" as opposed to computing "hardware." Recent work in neuroscience and learning clearly has this as one of its sources. The third has been the field of cognitive anthropology, which has studied what Jean Lave (following Michael Cole and others) calls "outdoor psychology." She writes that "contemporary theorizing about social practice offers a means of exit from a theoretical perspective that depends upon a claustrophobic view of cognition from inside the laboratory and school" (Lave, 1988, p. 1). The work of Vygotsky has played a role in this approach as well, with his emphasis on socio-cultural factors.

A detailed cataloging of the achievements of recent work cannot be undertaken here; an excellent discussion of this territory produced by a National Research Council (NRC) committee in the USA is cited in the "Further reading" list below. It will have to suffice to say that much progress has been made – as Lee Shulman had hoped – on the learning of specific school subjects. There has also been headway: on transfer of learning, a topic of longstanding interest; on the design of learning environments, especially ones that effectively incorporate technology; on how motivation and learning interact; on the respects in which the learning processes of novices are similar to, and differ from, the learning processes of experts; and on how children gradually learn to monitor their own cognitive activities, including learning ("metacognition").

However, one interesting emerging line of work with special significance for reframing the role of the teacher is worth highlighting. Jean Lave and Etienne Wenger have focused on examples, gleaned from around the world, of how learning takes

place in apprenticeships (for instance, becoming a tailor in Africa, becoming a midwife in the Yucatan). They studied how the student moves from being a legitimate but peripheral member of a community of practice to becoming a full participant (Lave and Wenger, 1991). This work has led to some experiments in the USA by Ann Brown and Joe Campione, and others, that have focused on recasting the school classroom as a "community of learners," with concomitant change in the role of the teacher along somewhat Deweyan lines (Brown and Campione, 1990). Closely related to this has been the work of the cognitive psychologist James Greeno and his co-workers, who have developed the theoretical position known as "situated cognition," which also portrays learning as being situated in social settings. According to this view, cognition, and thus learning, cannot be understood if regarded as situated solely in people's heads. This work quite closely follows the lead of John Dewey and his colleague George Herbert Mead, who regarded the psychological distinction of "inner and outer" – a distinction that goes back at least as far as the work of Descartes – as outmoded (see Greeno et al., 1996). The current scene with respect to theories of teaching and learning, then, is quite dynamic, and there is much grist here for the philosophy of education mill.

See also 1 THE SOCRATIC MOVEMENT; 4 THE EDUCATIONAL THOUGHT OF AUGUSTINE; 6 ENLIGHTENMENT LIBERALISM; 7 ROUSSEAU, DEWEY, AND DEMOCRACY; 12 THE ANALYTICAL MOVEMENT; 17 THE CAPACITY TO LEARN; 18 MOTIVATION AND CLASSROOM MANAGEMENT; 19 THE MEASUREMENT OF LEARNING; 20 KNOWLEDGE, TRUTH, AND LEARNING; 22 MORAL EDUCATION

References

- Brown, A. and Campione, J. (1990) Communities of learning and thinking, or a context by any other name. In D. Kuhn (ed.), *Developmental Perspectives on Teaching and Learning Thinking Skills*. Contributions in Human Development, 21. Basel: Karger.
- Burbules, N. (1993) *Dialogue in Teaching: Theory and Practice*. New York: Teachers College Press.
- Carr, D. (2000) *Professionalism and Ethics in Teaching*. London: Routledge.
- Cleverley, J. and Phillips, D. (1986) *Visions of Childhood: Influential Models from Locke to Spock*. New York: Teachers College Press.
- Dewey, J. (1933) *How We Think*. Chicago: Henry Regnery.
- Dewey, J. (1966) *Democracy and Education*. New York: Free Press (originally published in 1916).
- Dewey, J. (1969) *The School and Society* and *The Child and the Curriculum*. Chicago: University of Chicago Press, Phoenix Books joint edition (originally published in 1902).
- Dewey, J. (1988) *The Quest for Certainty*. Carbondale: Southern Illinois University Press (originally published in 1929).
- Fenstermacher, G. (1986) Philosophy of research on teaching: three aspects. In M. Wittrock (ed.), *Handbook of Research on Teaching*, 3rd edn. New York: Macmillan, pp. 37–49.
- Greeno, J., Collins, A., and Resnick, L. (1996) Cognition and learning. In D. Berliner and R. Calfee (eds), *Handbook of Educational Psychology*. New York: Macmillan, pp. 15–46.
- Hamlyn, D. (1978) *Experience and the Growth of Understanding*. London: Routledge.
- Hardie, C. (1962) *Truth and Fallacy in Educational Theory*. New York: Teachers College Press.

- Haroutunian-Gordon, S. (1991) *Turning the Soul: Teaching through Conversation in the High School*. Chicago: University of Chicago Press.
- Hirst, P. (1974) *Knowledge and the Curriculum*. London: Routledge.
- James, W. (1958) *Talks to Teachers on Psychology; and to Students on Some of Life's Ideals*. New York: Norton (originally published in 1899).
- Joyce, B., Weil, M., and Calhoun, E. (2000) *Models of Teaching*, 6th edn. Boston: Allyn and Bacon.
- Kulp, C. (1992) *The End of Epistemology*. Westport, CT: Greenwood.
- Lave, J. (1988) *Cognition in Practice*. Cambridge: Cambridge University Press.
- Lave, J., and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation*. New York: Cambridge University Press.
- Lipman, M. (1988) *Philosophy Goes to School*. Philadelphia: Temple University Press.
- Lipman, M. (1991) *Thinking in Education*. New York: Cambridge University Press.
- Locke, J. (1975) *An Essay Concerning Human Understanding*, ed. P. H. Nidditch. Oxford: Clarendon Press.
- Locke, J. (1996) *Some Thoughts Concerning Education and Of the Conduct of the Understanding*, ed. R. Grant and N. Tarcov. Indianapolis: Hackett.
- Montessori, M. (1972) *The Secret of Childhood*, trans. M. Costelloe. New York: Ballantine.
- National Research Council (1999) *Improving Student Learning*. Washington, DC: National Academy Press.
- Neill, A. (1960) *Summerhill: A Radical Approach to Child Rearing*. New York: Hart.
- Phillips, D. (1995) The good, the bad, and the ugly: the many faces of constructivism. *Educational Researcher*, 24(7), 5-12.
- Phillips, D. (ed.) (2000) Constructivism in education: opinions and second opinions on controversial issues. In *99th Yearbook of the National Society for the Study of Education*. Chicago: University of Chicago Press.
- Phillips, D. and Soltis, J. (1998) *Perspectives on Learning*, 3rd edn. New York: Teachers College Press.
- Plato (1976) *Meno*, trans. G. M. A. Grube. Indianapolis: Hackett.
- Plato (1992) *Republic*, trans. G. M. A. Grube and C. D. C. Reeve. Indianapolis: Hackett.
- Reeve, C. D. C. (1988) *Philosopher-Kings: The Argument of Plato's Republic*. Princeton, NJ: Princeton University Press.
- Reich, R. (1998) Confusion about the Socratic method: Socratic paradoxes and contemporary invocations of Socrates. In S. Tozer (ed.), *Philosophy of Education 1998*. Urbana, IL: Philosophy of Education Society, pp. 68-78.
- Rousseau, J.-J. (1979) *Émile*, trans. A. Bloom. New York: Basic Books.
- Rousseau, J.-J. (1987) *On the Social Contract*, trans. D. Cress. Indianapolis: Hackett.
- Scheffler, I. (1960) *The Language of Education*. Springfield, IL: Thomas.
- Scheffler, I. (1967) Philosophical models of teaching. In R. Peters (ed.), *The Concept of Education*. New York: Humanities Press, pp. 120-34.
- Shulman, L. (1986) Paradigms and research programs in the study of teaching: a contemporary perspective. In M. Wittrock (ed.), *Handbook of Research on Teaching*. New York: Macmillan, pp. 3-36.
- Shulman, L. (1987) Knowledge and teaching: foundations of the new reform. *Harvard Educational Review*, 57(1), 1-22.
- von Glasersfeld, E. (1991) Introduction. In E. von Glasersfeld (ed.), *Radical Constructivism in Mathematics Education*. Dordrecht: Kluwer, pp. xiii-xx.
- Woodruff, P. (1998) Socratic education. In A. Rorty (ed.), *Philosophers of Education: New Historical Perspectives*. London: Routledge, pp. 14-31.

Further reading

- Green, M. (1986) Philosophy and teaching. In M. Wittrock (ed.), *Handbook of Research on Teaching*, 3rd edn. New York: Macmillan, pp. 479–501.
- Green, T. (1971) *The Activities of Teaching*. New York: McGraw-Hill.
- National Research Council, Committee on Developments in the Science of Learning (2000) *How People Learn: Brain, Mind, Experience, and School*, expanded edition. Washington, DC: National Academy Press.