

Reflecting on Practice: using learning journals in higher and continuing education

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ABSTRACT *The purpose of this study is to report on the use of learning journals as vehicles for encouraging critical reflection among non-traditional students and to compare variances with studies among traditional students. An objective of the study was to understand how adult students in a 'technical' computer class responded to the requirement for learning journals. Qualitative research focused on whether learning journals prove to be an effective teaching tool in science-based, adult learning. The study was conducted at Columbia University's Computer Technology programme in Continuing Education. Results suggest that non-traditional students are more skeptical than traditional students about using learning journals and more likely to use them as study tools. An implication of this study is that student perception and skepticism of the assignment can affect the objective of developing reflective thinking. This implication stresses the need to account for student perception in studies on learning journals and critical reflection.*

Introduction

The use of learning journals as a method for engaging traditional students in critical reflection has been widely discussed in the literature. However, their use in assisting adult non-traditional students, particularly those who are engaged in profession-orientated educational programmes of continuing higher education has received comparatively little attention. This paper focuses on the question of how the use of journals impacted the learning process of adult students of the latter category and how this impact compared to that of students of the former category. Specifically, the study focused on students attending a computer technology class. The class, Computer Architecture, is a required course in an 18-month computer technology certification programme at Columbia University. The courses in this certification programme are designed for adult students interested in changing their careers. The curriculum focuses on real-world topics that are essential to the effective technology practitioner in the workplace. The instructor for the course required the submission of a weekly learning journal from each student during the 15-week course. Students were asked to be reflective about new career opportunities and how to apply technology to the workplace.

For the purposes of the study, a select number of journals were reviewed from three successive semesters of the same class; each had over 100 students. Subsequent to the class, students were interviewed to provide further elucidation of the data supplied in the journals. The purpose of the study was to understand the immediate and extended impact of journals as a learning tool for working with adult students, and for promoting critical reflection. The findings of this study raise questions about the pedagogical assumption, expressed in the literature, that journals provide a tool for learning (e.g. DeAcosta, 1995) and that critical reflection can be assessed in student journals independently of non-reflective considerations or factors (i.e. Kember *et al.*, 1999). An implication that follows from this study stresses the need to check theoretical frameworks, built around such pedagogical assumptions, against actual student responses: in this case, against the impact of the journal-writing requirement.

The Concept of Reflection in Learning

The use of journals as a learning tool in the development of critical reflection poses a basic question about the role of reflection in learning. Reflection has received a number of definitions from different sources in the literature. Depending on the emphasis on theory or practice, literature definitions vary from philosophical articulation, as in John Dewey and Jurgen Habermas, to formulations from practice-based perspectives, such as the research-in-action constructs developed by Schön (1983), or Kolb's (1984) use of reflection in the experiential learning cycle. With specific respect to teacher training, Morrison (1996) referred to reflection as a 'conceptual and methodological portmanteau'. According to Morrison, the manner in which reflection is commonly used has shuttled between the process of learning and the representation of that learning.

With respect to the process of learning, Moon (2000) suggested that individuals reflect on something in order to consider it in more detail. Dewey (1933) and Hullfish & Smith (1978) suggested that the use of reflection supports an implied purpose: individuals reflect for a purpose that leads to the processing of a useful outcome. With respect to the role of reflection in learning, therefore, ability and process are also individual. While many people reflect, it is in being reflective that people bring about 'an orientation to their everyday lives. For others reflection comes about when conditions in the learning environment are appropriate' (Moon, 2000, p. 186). Engendering the appropriate learning environment is the pedagogical task. Journal writing represents a formal tool for developing reflective thinking. Holly (1989) referred to the metacognitive effect of journal writing, and its ability to enable self-enquiry and facilitate critical consciousness. Indeed, the literature offers evidence that students, regardless of the course topic, improve their learning by keeping journals. Abbas & Gilmer (1997) explored the use of learning journals as an interaction between student and instructor, designed to stimulate active learning. Their research promoted the role of the instructor as active facilitator in the journal-writing process. Taggart & Wilson (1998) expanded this concept by suggesting strategies to enhance a student's reflective capabilities while writing journals.

Verifying reflective thinking in journal writing became the subsequent question to consider, one taken up by Kember *et al.* (1999). Their study adapted Mezirow's (1991) categorisation scheme for codifying evidence of reflective thinking in journal writing. The current study engages, directly and by implication, some of the above-mentioned pedagogical practices and assumptions surrounding critical reflection and its relation to the use of learning journals.

The Use of Learning Journals

This section provides an analysis of the existing literature on learning journals in higher education and summarises common themes about their use as learning tools. This section also focuses on the three major areas of research on learning journals that form a basis for the current study. They are:

- the value that journals bring to the student learning process and the concern for how journals can be used by instructors to facilitate student cognitive development in the fields of science, engineering, and mathematics;
- learning journals and the transition from theory to practice;
- the various types of learning journals that have been used to facilitate critical reflection in student learning.

The Value of Learning Journals in Science, Engineering and Mathematics

A review of how learning journals have been applied in the fields of science, engineering, and mathematics is important in the context of the current study in a computer technology curriculum. This group of fields may not, at first, appear to provide an applicable environment to support journal writing because of its specialized set of knowledge criteria: knowledge based on axioms and demonstrable proof. However, Moon (2000) suggested that while there are relatively few accounts in the literature, there are clear indications of the manner in which learning journals have been used to facilitate learning in these disciplines. For example, in the field of science research it has been shown that learning journals force students to replicate ideas and facts (Powell, 1997; Chatel, 1997; Meese, 1987). Harmelink (1998) found that science students who kept journals improved their learning and communication skills. Perhaps the most significant research, done by Selfe *et al.* (1986), has been on the question of how journal writing assisted mathematics students. Their study showed that while learning journals did not necessarily assist students with earning higher grades on tests, journals did assist students in developing abstract thinking that in turn allowed them to better conceptualise the meaning of technical definitions. In addition, students appeared to develop better strategies in problem solving through writing as compared to just memorising calculations. Their findings are further supported by research from BeMiller (1987). Selfe & Arbabi (1986) studied responses to journal writing among physics students, requiring them to write at least one page each week on their experiments. Although most students initially responded negatively to the exercise, 90% of them eventually admitted that the

journals helped them clarify their ideas and thoughts. Grumbacher (1987) examined physics students and found that through the use of journals they were better able to synthesise their knowledge, and reflect upon its impact on their learning and personal experiences. Significantly, and corroborated by the current study, the research on learning journals in these ‘technical’ disciplines appears also to suggest that students do not initially understand how and why journals can help them. This suggestion was especially evident in the initially negative responses that students reported in the Selfe and Arbabi study.

Learning Journals and the Transition from Theory to Practice

This section focuses on how learning journals can be used to relate classroom theory to situations of practice outside the classroom. The importance of moving from theory to practice is relevant to the current study in that its subjects are adult students seeking new careers. Indeed, the process of taking material learned in the classroom and understanding its application in the workplace is significant for student success in their new careers.

Dart *et al.* (1998) conducted a study on how graduate teachers in training used journals to relate theory to practice. These researchers found that students were better able to link theory to practice and vice versa in the latter parts of the course, thus supporting their claim that the use of journals provided a new method of learning and reflection. In the field of nursing, Johns (1994) discusses ‘influencing factors’ in reflective writing and how they can guide learning from experience. Heath (1998) used ‘double entry’ journals, which require secondary (subsequent) reflection on initial entries, to provide guidance for students in understanding how to link theory to practice and back to theory. Morrison (1996) based his research on Schön’s (1983) concepts of ‘reflection-in-action’ and ‘reflection-on-action’; like Heath, he posed questions to students that required them to consider relationships among personal, academic, and professional activities, thus expanding their vision and developing reflective activity.

Also linked to adult education theory is the challenge that learners face when attempting to overcome their biases (Mezirow, 1990); Rainer (1978) used journal activities to enhance a sense of perspective that over time affected student attitudes and behavior. With respect to personal experience, a useful section in a journal can be the ‘period log’, in which a period of life is reviewed and a common theme or direction is considered.

Types of Learning Journals

Journals can be created in different shapes, sizes and forms. However, whether a journal is recorded in an audio, video or word processing medium, the significant organizing concept is in its design and structure. Listed below are three types and formats that have been used.

An *unstructured* journal allows students to produce their own format. Using their own design, students tend to use a free writing format, open to a range of content

and structure of design. Unstructured journals often resemble a diary format. Unfortunately, the unstructured nature of this type of journal makes it difficult to compare with other formats used by students in the same class, and thus makes it difficult to ascertain how students are reflecting and learning as a group.

A *structured* journal carries an imposed form of constraint regarding the manner in which it is written. Its purpose is to benefit both instructor and student. The instructor obtains value by receiving information in a specific format or range of formats. This allows the instructor to compare student responses and reflections and obtain feedback on specific discussions and lectures. Students, for their part, are able to follow a template, which serves to provide guidance to students on approaching and developing journals (Johns, 1994).

The development of *dialogue* journals, which can be used methodologically to train student expression and reflection, was explored by Garmon (1998) and Peyton (1993). Peyton's model resembled a mentor/mentee relationship requiring a consistent one-on-one interface and a dialogue journal as the vehicle for communication. Staton *et al.* (1988) defined dialogue journals as a method to encourage the exchange and development of ideas between two or more writers. Lukinsky (1990) provided guidance to instructors on the development and use of different types of learning journals, and discussed the benefits of each type for the distinct purpose of increasing reflective capacity in student writing. Thus, the literature suggests that students benefit more from the guidance and formal instruction of a teacher in developing self-reflective critical thinking than without this guidance.

In summary, the existing literature on the use of learning journals in higher education indicates that it can be an effective learning instrument. Students initially tend to find the use of journals uncomfortable or have difficulty understanding why it is being requested. There is evidence that the use of learning journals facilitates critical reflection, particularly as it assists students in conceptualising abstract meaning and relating it to practice. Research on the use of learning journals in technology fields in higher education among non-traditional students, however, is lacking.

Research Methods

A review of the literature on learning journals for students in higher education, as summarised above, provides theoretical and contextual grounding for the current study and informs its two principle modes of inquiry:

- an evaluative review of the learning journals submitted by students; and
- an interview of selected students who completed the course.

Review of Learning Journals Submitted by Students

Students were required to submit learning journals each week referencing the prior week's lecture. The format used varied from student to student; however, the instructor provided sample formats so that students would receive guidance on what

a journal could look like. Students were required to submit two copies of their journals: one copy was returned to the student the following week with comments from the instructor; the second copy was kept for analysis. Thus, the instructor used a dialogue journal format to facilitate critical reflection. Learning journals from 20 students were selected for study. There were three components to the selection process:

- equal representation by student gender;
- 10 students from each of the two sessions of the course;
- an equal distribution of students from the three different departments of study (or study major).

The actual selection was made by sequentially selecting every tenth student in alphabetical order by last name. Journals were filed in sequential order by last name. If the gender and study major were not equally represented, then the researcher continued the cycle of selection by starting with the second file first and reviewing every third folder. This process was continued until the sample selection was satisfied. Each student set of learning journals consisted of up to 15 journals, or one for each class session. Therefore, up to 300 physical learning journals were read.

Three researchers read each student set of learning journals in the sample with the aim of identifying information about the content, formatting style and subject matter they contained. Researchers also read for indications of critical reflection. The review focused on the overall value that the student reported from the lectures. Notes from this review were then summarised. Common themes and concerns were extracted so that questions could be developed for an interview guide (Appendix I), which was used with a select number of students who had completed the course.

Interviews with Selected Students

Two researchers solicited 10 student volunteers to be interviewed 6 months after completing the course. Their objective was to gain an understanding of student perceptions of the journal-writing assignment and of the extended effects of learning journals on students. These students were approached during a subsequent course in the curriculum in which the instructor announced that volunteers were being sought. The volunteers signed a consent form agreeing that their interview data would be used for research purposes and reported in aggregate only. Four of the 10 students were male.

The interview guide (Appendix I) was developed to facilitate organisation, consistency and coverage of the questions—objectives discussed in Patton (1990). This interview guide was not supplied to interviewees; it was used by two researchers as a checklist to ensure that interviews touched on relevant topics. Each interview lasted approximately 30 minutes. While the interviewees did not receive a copy of the questions, the researchers initially provided them with an idea of the topics that were the focus of the study.

Results of the Study

This section presents the results of the study in terms of an analysis, and two summaries of data collected from the journals and interviews; it compares the data to related literature on the use of learning journals in higher education.

Learning Journal Analysis

While students were encouraged to be creative in formatting journals, 90% of the journals appeared in the format provided as a sample with the syllabus. This outcome suggests that in spite of the encouragement toward independent formatting, students were concerned with using a format that appeared to be preferred by the teacher. Possible reasons for this type of response, according to Kerka (1996), include the following: 'lack of proficiency with reflective writing, fear resulting from open-ended writing requirements, privacy issues, and unequal balance of power between teacher and students'. Fisher (1996) and Abbas & Gilmer (1997) also cited concerns related to this type of student response. They considered the student-teacher interaction through various interpretive concepts: e.g. as challenges, bonds or 'non-threatening' modes of learning encountered and encouraged through the use of journals. This response can also be cited as an instance in which the opportunity for self-reflective response—in the matter of formatting—was bypassed in favour of following a given model.

Secondly, with respect to content, 55% of the students submitted journals that seemed to become more self-reflective in the latter part of the course. The criterion for self-reflection was based on written indication about how the student assessed content from class lectures in relation to their work or their experiences in life. For example, one student concluded: 'I return to work the next day feeling empowered and much more knowledgeable. I think about what I had known instinctively before the class [which] is now backed up with concrete knowledge and how much more I need to learn if I wish to stay in this field'. The increase in self-reflection, noted as an increase in the frequency of such assessments, while moderate, could be attributed to two intervening factors. First, the instructor provided weekly written feedback on the journals, often encouraging students to discuss how they relate the lectures to other areas of interest. Thus, students were prompted to be more reflective. This interactive dimension of the writing process compares to the function and, hence, benefits, of the dialog journal described in Peyton (1993). Garmon (1998) specifically identifies the dialog journal as a tool that promotes reflection. The current study adds the dialogic dimension to the two general claims that learning journals facilitate interaction between students and instructor (Abbas & Gilmer, 1998) and encourage reflection (Kerka, 1996).

A second factor contributing to the incremental development of critical thought during the latter part of the course may be the natural progression of cumulative experience and practice. Indeed, less than 5% of the students admitted having previous experience with learning journals. The implication from these facts supports De Acosta's (1995) claim that student journals provide opportunities for

students to learn *how* to reflect. Other researchers have identified the use of journals as a technique for *enhancing* reflective thinking and facilitating self-discovery (Taggart & Wilson, 1998; Fisher, 1996). The remaining 45% of students submitted journals that did not demonstrate an incremental development in critical reflection. This comparative lack suggests unwillingness or inability to explore the material in ways extending outside its technical content. The literature provides a number of reasons why students might find journal writing challenging and difficult. Francis (1995) found that some students resist because they cannot see relevance in the exercise of writing journals to their current interests. Other students feel reflection is overemphasized (James & Denley, 1993). Canning (1991) reported that some students have study habits that let tasks build up over time until delivery or examination is necessary. Such habits are at odds with incremental progressions of learning possible through weekly journal writing.

Twenty-five per cent of the journals addressed questions to the instructor. These questions typically requested clarification of an issue discussed in class or covered in assigned readings. The relative lack of questions could be attributed to a number of factors, some relating to those introduced by Kerka (1996), cited above. One factor could be that students felt uncomfortable with submitting written questions to their instructor. Another might be related to stigmatisation associated with submitting, in essence, written evidence of a student's limited comprehension: a privacy issue. In other instances, the problem becomes more significant for students who come from cultures that define this interrogative type of communication as inappropriate or disrespectful to the teacher. Furthermore, students might feel more comfortable with simply asking questions in class, which to them might result in a better and more immediate response. Finally, students might feel incapable of articulating a technical question in a format with which they are otherwise comfortable; i.e. they may have a limited ability to articulate questions in writing.

Summary of the Interviews

Researchers followed the interview guide in each of the 10 sessions. The demographics of the 10 students are shown in Table 1.

Results from the interview allowed researchers to further assess the significance and relative successes of the student journals. Their heterogeneous responses are summarised under the question headings that follow.

1. What was your initial reaction to being required to use a learning journal? Students' initial reactions were mixed, and sometimes prejudicial toward journal writing. One student felt 'insulted at first to be required to use something that seemed better suited for children'. Another student was not upset, but had reservations about how to do a journal and 'whether there was enough information to fill-up the journal'. Yet one student was glad and felt comfortable writing the journals.

TABLE I. Demographics of the 10 students

Gender	Race	Current profession	Columbia Major
Male	Caucasian	Sales	Information systems
Male	Caucasian	Finance	Information systems
Male	African American	Banking	Information systems
Male	Asian	Manufacturing	Database
Female	Asian (Indian)	Advertising	Database
Female	African American	Clerical	Information systems
Female	Caucasian	Teacher	Information systems
Female	Latino	Sales	Information systems
Female	Caucasian	Graphic artist	Information systems
Female	Caucasian	Law	Information systems

2. *How did you use the learning journals during the course?* Students used journals as transcripts; that is, they used them to verify their understanding of material that was discussed in class and in readings. Two students used the journal as a way of studying for exams and by using them as they would session handouts (which were not supplied to the class by the instructor). Four students used the journals as a means of balancing their learning style with the instructor's style of teaching. In this case, the teacher's lecture style was noted as being 'at odds with the way I preferred to learn'. The learning journal, therefore, allowed this student to mediate the teacher's style into a form that facilitated a knowledge transfer.

3. *What were the benefits of doing learning journals?* Students responded that knowledge transfer was the most beneficial aspect of their learning journals. The process of having to articulate in writing the meanings of technical terms was reported as a particularly effective learning experience. Six students felt that a key benefit to using journals was that it forced a discipline on them to review class discussion. One student stated: 'it forced me to do the work, and I did not have to redo my notes; it simply was a great study device'. Students saw the benefits of the learning journal as a vehicle to confirm their understanding of the material.

4. *What were the downsides or disadvantages of using learning journals?* Students unanimously felt that the time requirement to do journals was the biggest disadvantage of using them. Students also stated that their lack of experience with using learning journals delayed its effectiveness as a learning tool. In essence, the process of learning how to best write and use journals was an initial impediment that was perceived as wasted time. Five students found that producing learning journals on a weekly basis was difficult and unnecessary. These students preferred to summarise their learning according to subject sections as opposed to a perceived artificial cutoff imposed by a class schedule. Finally, one student stated that hand-written notes were just as effective in learning as submitting a journal in a typed and formal presentation. Hand-written learning journals, according to this student, are more natural, challenge students to take better notes and are much more time efficient.

5. *Did producing learning journals change your learning process?* One student felt that the journals helped him to perform better academically. Another suggested that the process helped her understand the 'real-world' aspects of the course material. She stated: 'it also made me more critical of the material as well as my instructor'. Another student felt that the experience of using journals had a permanent impact on him professionally. Specifically, the journals have instilled good habits in taking notes during professional meetings and conversations.

6. *Have you continued using learning journals in other courses or in other situations?* Five of the 10 students continue to use journals in other classes even though they are not required to do so. Three students stated that, while they did not 'journalize' their notes, the experience of using learning journals had significantly improved their note taking abilities. None of the students complained that other instructors did not collect and respond to the journals. This continued practice suggests that the journals have value to these students notwithstanding any collaboration with an instructor.

7. *Do you think that learning journals can be used for all types of courses?* All of the students felt that learning journals were not for every course. They specifically stated that courses held in computer laboratories would not be conducive to journal writing. It appears from the responses that learning journals are better suited for lecture and discussion classes as opposed to hands-on computer application courses.

8. *Did you use the learning journal as a way of collaborating with your instructor?* Students used their learning journals to ask questions of the instructor or to suggest that the instructor review certain topics. The students did not use the journals to communicate or explore concepts with the instructor or to question his approaches to the class syllabus. Thus, collaboration was simplified and limited to a formal question and answer format.

9. *Did the journals assist in critical reflection?* Students were puzzled by the concept of critical reflection and struggled with why it would be important in journal writing. After the concept of critical reflection had been explained, students still felt that there was not enough time to delve into a self-analysis or reflective process. Students showed an interest in the concept, but not an understanding of how to approach doing it.

Summary of Common Themes

Several common themes emerged from a review of the journal readings and interview responses.

- Students had initial concerns about their ability to handle the journal. Writing journals caused over half the students in the sample to feel anxiety, especially those who were coming back to school after a long absence.

- Some students initially felt insulted by the requirement to produce learning journals. They felt that journals were better suited for children than for adults.
- Students have difficulty designing their own presentation formats; they need guidance in the format of the learning journal. Less than 5% of the students had prior experience with producing journals.
- Students used the journals mainly to list and summarise material covered in class, rather than as vehicles of communication with the instructor.
- Only 50% of the journals were submitted on a weekly basis. This statistic suggests that it is difficult for adult students to take the time or discipline to complete journals weekly.
- The use of learning journals may not be for all types of classes, specifically those that require hands-on laboratory work.
- Students may not understand the concept of critical reflection. Instructors need to teach key concepts before expecting students to understand the value of learning journals and how to use them.

Implications: factoring student perceptions

The literature review in the preceding section reveals the prevailing assumption that student journals can provide an opportunity for expression and development of critical reflection. (Other interpretive concepts proposed and examined in the literature include promoting, prompting, facilitating and enhancing critical reflection.) This terminology underscores the basic pedagogical assumption that continues to warrant the assignment of learning journals in adult college courses today. The assumption, justifiable or not, motivates the administration of the journal assignment; that is to say, it falls properly within the instructor's domain of assumptions. It informs the instructor's perception (expectations, value and utility) of the journal assignment. The goal of promoting critical reflection through the use of student journals is based on the perception of what the journal assignment can accomplish: that it can provide the opportunity for exercising critical thinking. Unfactored into this unilaterally motivated assignment, however, is an awareness or appreciation of the student's domain of assumptions: how student goals, expectations, and perceptions of the same assignment can impact the pedagogical goal of achieving critical reflection.

Kember *et al.* (1999) proposed that the success of student journals in producing reflective thinking is to be determined by assessing whether reflective thinking can be identified in the journals themselves. While their proposed model is useful in very specific ways, it remains a unilateral project that is unconcerned, by schematic design, with taking into account the student's perception of the assignment itself: how students *respond* to the requirement of such an assignment, and their sense of its practical utility and educational worth. In fact, if these types of concerns were to be identified in a student journal, according to the model of Kember *et al.*, they would most likely be coded as introspective—a non-reflective activity. The current research investigated several aspects of this introspective activity to better understand student reception and perception of the journal assignment in terms of its

practicality and value. The results of this study demonstrate several ways in which student reception/perception of the learning journal assignment can impact the practical outcome of an assignment whose purpose is to promote reflective thinking. An implication suggested by the findings of this study point to an inextricability between reflective and affective dimensions in the process of developing critical reflection through the use of student journals.

The Kember *et al.* model represents an attempt to develop an objective method for testing reflective thinking. The question may be raised, however, whether the attempt to formalise such an objective method is appropriate to the testing of a phenomenon that involves and derives from an interactive *relationship* between the tester and the testee—whether the testor, a factor by virtue of being a reader, assigner and grader in the course of the journal writing process, can be objectively factored out of an analysis of what is essentially an interactive exchange. The fundamental question that arises is whether critical reflection can be properly studied in isolation of the surrounding, contextualising, and influencing factors that contribute to its relative success or failure.

The current study shows that feelings of anxiety and insult, feelings that the journal requirement is inappropriate to the adult student's sense of maturity and real-life time constraints, and feelings of inadequate preparation or knowledge to master the journal assignment have been expressed by students in relation to the process of journal writing and the objective of critical reflection. In the Kember *et al.* model, these considerations would be categorised as affective responses, more appropriate to introspection than critical reflection. Nevertheless, affective factors assert influence on the practice of journal writing and, hence, the demonstrations of critical reflection they may or may not contribute to. If students show a lack of reflective thinking in journal writing, it could mean that they have not been properly exposed to a learning environment that focuses on reflective skills, or to produce the written evidence of reflective thinking.

The current study suggests that the production of reflective thinking is affected by student attitudes and pre-conceptions about the vehicle itself, the learning journal. A study that simply demonstrates a lack of reflective thinking in student journals can leave the researcher at an empirical dead-end. A demonstrable lack of reflective thinking can suggest no pedagogical course of action. Learning about student reaction and responses, however, can suggest and identify arenas of concern traditionally addressed through pedagogical courses of action. Furthermore, studying student responses at the affective level reveals the influences and practical inextricabilities, of so-called non-reflective activity, such as introspection, in the production of reflective thinking. It also points to a theoretical idealism in the distinction made between these realms of thinking—the philosophical idealism of freeing thoughts from feelings and their cultural sources—as well as revealing the impulse to impose hierarchical classifications on student thinking in the form of schematic divisions.

What does it mean to separate affective from reflective thinking? To abstract any kind of thinking from its worldly context of personal and social complexities? And to classify students (via an interpretation of their writing) according to a schema

whose classificatory criteria are not necessarily explained or understood by the students? The goal of determining the level of reflective thinking is a project that bypasses the question of determining whether the assignment of journal writing does or does not in practice encourage reflective thinking, and bypasses the question of how the requirement of this assignment can impact the opportunities to think reflectively.

The Kember *et al.* model can be used to classify statements as demonstrating an occasion or lack of indicators assumed to evince reflective thinking in student journals, but it cannot confirm anything more than a perceived presence or lack of signs of reflective thinking in student writing. Given that writing is not all there is to thinking, we need to augment our understanding about the complexities of critical reflection when we draw conclusions about one type of activity by citing evidence of a phenomenologically different activity.

To begin to assess the potential for reflective thinking as a practice engendered in the use of learning journals, one can begin by assessing student perceptions and uses of the vehicle itself. What students feel about the required assignment can affect their performance in fulfilling the aim of achieving critical reflection. How they understand and perceive this aim cannot be underestimated as a factor that affects the qualitative production of reflective writing. When the aim of a writing assignment is to promote critical thinking, it is reasonable to take into account factors that can influence (enhance or inhibit) its production.

Conclusions

The responses among non-traditional students, demonstrated in the findings of this study, speak to the need to consider student reception and perceptions of the journal writing assignment in order to evaluate its usefulness as a tool for developing critical reflection among traditional as well as non-traditional students. Some results of the study support the existing literature. For instance, the study was consistent with the literature in demonstrating that learning journals can improve knowledge transfer for students. This heuristic effect was supported in the feedback received from the 300 journals that were read, the feedback received from student interviews and the comparative analysis of this data with results assessed from other studies concentrating on students in science-related courses. On the other hand, some of the results of this research are at variance with those of the literature. In comparison to indications in the literature, a smaller percentage of students demonstrated critical reflection in their journal writings, and among those who did, the increase was both limited and mitigated by intervening factors. This outcome could be related to the degree of instructor interfacing in the journal writing process. A poor showing of critical reflection might indicate that an instructor did not provide adequate guidance or facilitation to the student on how to produce journals that are qualitatively reflective and collaborative. On the other hand, the results of this research suggest that non-traditional adult students can find it difficult to understand what is meant by reflection and how it applies to their practical goals of changing careers. These students do not have a natural or traditional association with the journal process

itself, as has been suggested, more or less, in much of the literature on learning journals. The current research therefore helps to expand the purview of study related to learning journals beyond what has been the dominant focus aiming at traditional students; it begins to draw out important variances when the focus is shifted to the study of non-traditional student groups. New areas of study, it is hoped, will emerge with an expanded scope of study groups.

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Appendix I: interview guide

1. What was your initial reaction to being required to use a learning journal?
2. How did you use the learning journals during the course?
3. What were the benefits of doing learning journals?
4. What were the downsides or disadvantages of using learning journals?
5. Did producing learning journals change your learning process?
6. Have you continued using learning journals in other courses or in other situations?
7. Do you think that learning journals can be used for all types of courses?
8. Did you use the learning journal as a way of collaborating with your instructor?
9. Did the journals assist in critical reflection?

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