

Articles

Critical Thinking in the Online Nursing Education Setting: Raising the Bar

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ABSTRACT

This article explores the effectiveness of writing to help nurse-learners develop critical thinking in an asynchronous, online learning environment. The formal written assignments of students in an online nursing health assessment program were analyzed for evidence of critical thinking according to Johns' Model of Structured Reflection (Johns, 1995) based on Carper's Ways of Knowing in Nursing (Carper, 1978), as well as for growth in discipline-specific writing. Informal contributions by participants and the instructor were studied for evidence of interaction. Results indicated that the online learning environment provided an effective forum that facilitated critical thinking and reflection through writing.

RÉSUMÉ

Cet article explore l'efficacité de la rédaction comme outil d'appui aux apprenants en sciences infirmières en vue de développer la pensée critique dans un environnement d'apprentissage en ligne asynchrone. Les travaux écrits formels des étudiants d'un programme de sciences infirmières en ligne sur l'évaluation de santé ont été analysées pour déterminer la présence de pensée critique selon le modèle de pensée critique de Johns (*Johns' Model of Structured Reflection*, 1995) basé sur la méthode de Carper (*Carper's Ways of Knowing in Nursing*, 1978), ainsi que pour déterminer la croissance dans la rédaction spécifique à la discipline. Des contributions informelles des participants et du formateur ont été analysées pour vérifier l'interaction. Selon les résultats, l'environnement d'apprentissage en ligne offrait un

forum efficace qui facilitait la pensée critique et la réflexion par la rédaction.

INTRODUCTION

More than ever before, nurses are seeking continuing education opportunities. The reasons for this are many, but one extremely important reason is the rapid changes occurring in the health care field. In Canada, the magnitude of this situation is apparent in the number of nurses who are pursuing baccalaureate degrees (Canadian Nurses Association, 2003), specialty courses, programs, and certificates in nursing. Their specific learning goals include enhancement of critical thinking skills, acquisition of knowledge in specialty areas, preparation for additional certification exams, review of theories and skills in specific areas, and acquisition of knowledge about the future of health care (Brooks, Fletcher, & Wahlstedt, 1998).

This article looks at an online nursing education project that responded to a group of nurses who required further study in the nursing health assessment field. The article also examines the project's online learning setting as a venue for enabling critical thinking.

LITERATURE REVIEW

Positioning Critical Thinking in Contemporary Nursing Education

During the last two decades, North American nurses have become increasingly interested in enhancing their critical-thinking skills. This interest is directly connected to the shift in nursing from a largely medically based model to a more holistic one (Johns, 1995; Powell, 1989). In practical terms, nurses are now required to think more critically about their actions so that they can respond, to the best of their abilities, to the needs of the whole person.

Not surprisingly, given this shift, the 1990s witnessed a proliferation of definitions of critical thinking in the nursing context. Examples of these are: "a skill applied to nursing process" (Case, 1994; Jones & Brown, 1991); "a variant of the scientific method used in clinical practice" (Shenk Pless & Clayton, 1993); "contextual formal reasoning undertaken with critical inquiry" (Schumacher & Severson, 1996); and "a necessary tool for socially responsible nursing practice" (Tanner, 1996). Recognizing that each definition has distinct value, the understanding of critical thinking used in this study

builds on the work of Facione, Facione, and Giancarlo (1996), who suggested that critical thinking means giving consideration to evidence, contextual information, theories, methods, and criteria. The study's understanding also builds on the idea that critical thinking involves reflection; Brookfield (1987), Mezirow (1981, 1990), and Glasner and Watson (1980) all described critical thinking as reflective thinking.

The decision to adopt the Facione, Facione, and Giancarlo (1997) position stems from its breadth, which encompasses the majority of the other definitions. Reflection is included because it is repeatedly identified as vital to the development of critical thinking among health-care students and practitioners (Smith & Johnston, 2002), which is clearly related to the prominence that reflective practice holds in the health field in general (Daroszewski, Kinser, & Lloyd, 2004; Kennison & Misselwitz, 2002; Kessler & Lund, 2004; Kluge, 2004).

Just as the nursing education literature is distinguished by contrasting definitions of critical thinking, it also lacks agreement on how to measure critical thinking. Some educators and researchers support the use of multiple-choice-type tests, while others recommend more qualitatively focused means, such as asking learners to analyze a situation (Oermann, Truesdell, & Ziolkowski, 2000) and evaluating student-prepared portfolios, student-prepared reflective journals (Ibarreta & McLeod, 2004), and learning exercises based on narrative pedagogies (Ironsides, 2003). Although all of these techniques have a place in nursing education, reflective writing is the focus of this study.

Johns (1995), who regards reflection as a primary tool of critical thinking, said,

reflection [on experience] . . . enables the practitioners to tell their stories of practice and to identify, confront, and resolve the contradictions between what the practitioners aim to achieve and actual practice, with the intent to achieve more desirable and effective work. (p. 230)

Stated another way, the proficient critical thinker is skilled in the technique of reflection, which, in turn, is a heuristic tool that fosters critical thinking (Kessler & Lund, 2004). Reflective learning has also been described as both cognitive and affective in nature: "Reflective learning is the process of internally examining an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self, and which results in a changed conceptual framework" (Kessler & Lund, 2004, p. 22). Thus, as Boud, Keough, and Walker (1985) suggested, reflective learning is a combination of intellectual and affective activities whereby individuals explore experiences to come to new understandings.

Johns (1995) further suggested that structured reflection is a valuable way of identifying and enabling the different ways of knowing in nursing—empirical, aesthetic, personal, and ethical—as described by Carper (1978). Johns and Carper’s views are central to the programs of Laurentian University’s School of Nursing, in Sudbury, Ontario. The School of Nursing was a key partner in the project described in this article.

Critical Thinking in the Online Nursing Education Setting

Interaction and reflective writing are two educational techniques that foster reflection and critical thinking. Both techniques can be practised effectively in more traditional nursing education settings and in the online (Internet-based) nursing education venue.

The online learning environment offers unique and scholastically valid ways for students to interact with the learning facilitator and other learners. When well managed, computer-based learning can facilitate interaction and enable rich and rapid feedback among peers, students, and faculty (Billings, 1999; Bonk & King, 1998; Carter & Rukholm, 2002; Harasim, Hiltz, Teles, & Turoff, 1996). This kind of networking can be used to create and support learning communities across vast distances, allowing faculty, expert practitioners, and more capable peers to be models, mentors, guides, and coaches without the hurdles of geography, travel, and specific time commitments (Carter & Rukholm, 2002).

Reflective journal writing and other writing-based activities have long been valued by educators; Bilinski (2002) noted that the “writing to learn paradigm,” with its emphasis on “personal transformation,” is an important tool in fostering critical thought and concept clarification. By comparison, the magnitude of the potential of the World Wide Web to support reflection through writing has only recently emerged in the nursing education literature. Still, the early findings are impressive. Kessler and Lund (2004) described how online reflective journaling, accomplished through email and electronic drop boxes embedded in a course website, can allow valuable feedback from the nursing instructor and serve as a record of learning outcomes achieved across the curriculum over time. It can also provide opportunities for nurse-learners to reflect on clinical practice experiences and develop new insights and understandings. Nursing students themselves reported that online journaling facilitates self-directed learning and critical thinking (Ibarreta & McLeod, 2004).

The first e-writing activities described in the literature focused on writing submitted to a faculty member for feedback, but there is now growing interest in the potential of online education for enhancing learners’ discipline-specific writing skills, as well as for the community thinking and writing that can occur within the context of a well-managed asynchronous bulletin board

or discussion forum. Bilinski (2002) pointed out that shared writing brings together experiences, feelings, implications, and connections, and, when this occurs, a very powerful combination of “support, vision, and challenge” becomes possible. Nurse-educators are also beginning to report how online discussion groups can not only foster understanding of content and support active learning (Harden, 2003), but also exemplify the collaboration that is the hallmark of successful practice in contemporary health care (DeBourgh, 2001). Although a relationship between reflective writing, when it occurs in a communal area such as an online bulletin board, and critical thinking is suspected, there is need for more work in this area.

Synopsis

This literature review has established that critical thinking has been an area of growing interest for North American nurse-educators since the 1980s, when it was identified as an important learning outcome of nursing curricula. The literature also indicated that reflection is a tool that can foster critical thinking and that reflective writing and interaction are educational techniques that can support and enhance critical thinking in the learning setting.

The current literature further suggested that there is a need to explore critical thinking through written reflection when it occurs via an online, asynchronous bulletin board. It is this gap in the literature that the nursing health assessment project explored.

THE NURSING HEALTH ASSESSMENT STUDY

The nursing health assessment project gave registered nurses an opportunity to refresh their assessment skills. Using a body-systems’ approach, a review of the nurse-participants’ knowledge of assessment theory and practice was offered through an online module. The project’s online setting was designed to allow participants to post their formal and informal writing assignments on an asynchronous electronic bulletin board, which was monitored regularly by a faculty member from Laurentian University’s School of Nursing. The goal was to provide nurse-learners with occasions to engage in critical thinking and share their thinking with peers.

Ethics approval for the study was granted through Laurentian University, since the study was a collaborative undertaking of the University’s School of Nursing and its Centre for Continuing Education. The School of Nursing provided content expertise for the online module and the faculty member who delivered the module. Instructional design and project management were provided by the Centre for Continuing Education.

The study had four main objectives: to assess whether critical thinking about nursing can occur through asynchronous, text-based discussion; to

identify whether such critical thinking might affect nursing practice; to track over time any development of the nurse-participants' growth as discipline-specific writers; and to assess nurse-learners' attitudes regarding the overall effectiveness of the online learning environment. The first three objectives are considered in this article.

METHODS AND DESIGN

The study was conceptualized as a quasi-experimental (before and after) design with quantitative and qualitative components. A first (pre-experience) questionnaire asked participants for relevant demographic information and posed an open-ended question about their expectations for their upcoming online learning experience (see Pre-Experience Questionnaire on opposite page); it was posted online within the WebCT-based module. A second online questionnaire (post-experience) was posted just before the end of the experience (see Sample Questions from Post-Experience Questionnaire on page 34).

The study included analysis of the participants' contributions to an asynchronous discussion board (see Pre-Experience Questionnaire on opposite page). Students' formal ("for grades") postings were analyzed for themes related to critical thinking, achieved through structural reflection based on different ways of knowing. Informal contributions made by students and their instructor were studied for evidence of interaction and discipline-specific writing.

DATA COLLECTION AND ANALYSIS

Data-collection methods included pre- and post-experience questionnaires and the nurse-participants' contributions (formal and informal) to the online discussion board. In this study, formal contributions were defined as postings required by the instructor for grading, and each student was asked to make two formal postings. The term "informal" referred to postings made by participants as they interacted to discuss content-related issues. No specific number of informal postings was required, but students were advised that failure to make regular, thoughtful contributions could affect their final grade.

Researchers gathered demographic information and data related to expectations regarding online learning from the pre-experience questionnaires. They examined the post-experience questionnaires for participants' assessments of the strengths and weaknesses of the online setting, as well as for their personal experiences in the nursing health assessment project.

PRE-EXPERIENCE QUESTIONNAIRE

1. Age in years _____
2. Gender: Female Male
3. Employment status:
 Full-time Part-time Not employed
4. If you are employed, in what area of nursing practice are you currently working? (for example, medical floor, ICU, mental health, gerontology, occupational health)
5. In the space provided below, describe your expectations regarding an online learning environment.

The informal contributions made to the bulletin board were studied for evidence of interaction and discipline-specific writing. The formal contributions were analyzed for evidence of thinking based on Carper's (1978) model of nursing education, called Fundamental Ways of Knowing in Nursing (see Table 1), facilitated through structural reflection (Johns, 1995). A constant-comparison approach was used to explore the experiences and ideas shared by the participants in their postings. The purpose of these analyses was to provide an accurate description of the learning accomplished (Creswell, 2003; Morse & Field, 1996) and to assess for evidence of critical thinking. The verbatim bulletin board postings were read independently by two investigators.

Discussion by the researchers continued until consensus was achieved; at times, this required a return to the original postings to re-read them. Final synthesis of data included illustrative comments (Creswell, 2003; Morse & Field, 1996).

**SAMPLE QUESTIONS FROM
POST-EXPERIENCE QUESTIONNAIRE**

1. Did the Nursing Health Assessment project meet your expectations of an online learning environment?

Yes No Please explain your response.

2. Which supports did you utilize during the pilot?

Project Co-ordinator

Technical Support Person

Laurentian Library Proxy found on your interactive CD-Rom

WebCT tutorial found on your interactive CD-Rom

Writing supports found on your interactive CD-Rom

Additional supports found on your interactive CD-Rom: Specify

3. Indicate if you were satisfied with the support provided during the pilot.

Project Co-ordinator

Satisfactory? Yes No NA

Please explain _____.

Technical Support Person

Satisfactory? Yes No NA

Please explain _____.

Laurentian Library Proxy

Satisfactory? Yes No NA

Please explain _____.

WebCT tutorial

Satisfactory? Yes No NA

Please explain _____.

Writing supports (CD-ROM)
Satisfactory? Yes No NA
Please explain _____.

Additional supports (CD-ROM)
Satisfactory? Yes No NA
Please explain _____.

Other supports
Satisfactory? Yes No NA
Please explain _____.

10. In order of priority (1 being highest priority), list the three things that were the greatest barriers to your success in Nursing Health Assessment.

11. What three specific suggestions do you have for students wishing to maximize their success in an online learning experience? List your suggestions in order of priority (1 being highest priority).

12. What three specific suggestions do you have for faculty/administration wishing to improve the online learning experience? List your suggestions in order of priority (1 being highest priority).

RESULTS

The 19 nurses from across Ontario who enrolled in the online module were also sent an information letter and a consent form (in the introductory materials for the module), inviting them to participate in the nursing health assessment study. Participants were informed that withdrawal from the study would in no way jeopardize their standing in the module.

All 19 nurse-participants signed and returned the consent form. Of these, 17 completed the project. Therefore, the findings described in this article are based on data related to these 17 nurse-participants, although not all 17 of them completed both questionnaires. Given the busy personal and professional lives of nurses, potential participants were advised that they were welcome to participate in the study in whatever ways best suited them.

Table 1: Johns's (1995) Model of Structured Reflection

Aesthetics	<ul style="list-style-type: none"> • What was I trying to achieve? • Why did I respond as I did? • What were the consequences of that for the patient? Others? Myself? • How was this person(s) feeling? • How did I know this?
Personal	<ul style="list-style-type: none"> • How did I feel in this situation? • What internal factors were influencing me?
Ethics	<ul style="list-style-type: none"> • How did my actions match with my beliefs? • What factors made me act in an incongruent way?
Empirics	<ul style="list-style-type: none"> • How did knowledge inform me or how should it have informed me?

From Johns, C. (1995). Framing learning through reflection within Carper's fundamental ways of knowing in nursing. *Advanced Nursing Practice*, 22, 226–234.

In all, 14 participants responded to the pre-experience questionnaire, and 10 of those responded to the post-experience questionnaire. By contrast, all 17 made formal and informal contributions to the bulletin board. As a result, 34 formal contributions and all of the informal contributions made by participants and the involved faculty member were analyzed.

Participant Demographics

Descriptive statistics were used to provide a summary profile of the 14 participants who completed the first questionnaire. All respondents were females between the ages of 31 and 60 years; most of them worked full-time (see Table 2). Their areas of nursing practice were gerontology and long-term care, with the exception of three respondents who worked in sexual assault, acute care, and mental health settings.

Table 2: Respondent Demographics (n=14)

Age	Frequency	Employment Status	Frequency
31 – 40	4	Full-time	10
41 – 50	7	Part-time	4
51 – 60	3	Casual	0

Findings Related to Ways of Knowing and Critical Thinking

Assignments were analyzed according to Carper’s (1978) four ways of knowing—aesthetic, personal, ethical, and empirical—as demonstrated through what Johns (1995) called structured reflection. Researchers conducted their analysis of the quality of thinking found in the nurse-participants’ writing assignments based on the assumption that postings demonstrating three or four ways of knowing represented higher-level critical thinking than those demonstrating one or two ways of knowing.

A second criterion used to assess participants’ writing assignments related to Johns’s idea that empirical thinking, given its singular emphasis on fact, is least representative of critical thinking. At the same time, it was acknowledged that, due to the module’s focus on nursing assessment theory and practice, empirically based knowing would be a central component of each formal posting. Additionally, it was recognized that the assigned topics would play an important role in eliciting different ways of knowing. Thus, for example, postings dealing with cardiovascular-oriented topics necessarily included empirical information to the near exclusion of the other ways of knowing, while topics involving medical histories and case studies facilitated both empirical and the other more qualitatively rooted ways of knowing.

Based on these distinctions, of the 34 formal bulletin board postings

- three assignments displayed four ways of knowing (n=3)
- four assignments displayed three ways of knowing (n=4)
- in four cases, empirically based knowing was the only kind demonstrated in the first assignment; in the second assignment prepared by these same nurse-participants, the outcome was different (n=4)
- in three cases, the nurse-participants displayed different ways of knowing in their first assignment, but only empirically based knowing in their second assignment (n=3)
- in five cases, participants demonstrated only empirically based knowing (n=5) in both assignments

Aesthetic Knowing

Aesthetic knowing often involves challenges to the self, as well as reflection on what the person is trying to achieve and why she or he responded in a particular way. It also tends to focus on the experience of consequence and the feelings of others.

The study participants displayed at least some of these various aspects of aesthetic knowing. For instance, the statement

I am much more comfortable discussing these issues with strangers than I am with a good friend . . . When I got to this section with my volunteer, I could feel my words were not coming as easily as they had been and my tongue was tripping on itself (I am certain my cheeks were also showing it!)

suggested self-analysis, as the nurse-learner reflected on why she responded as she did.

Participants' statements focusing on consequence often related both to the patient and the nurse. For example, one nurse-participant wrote: "We did try tympanic ones (thermometers) for a few months, but we found they increased the amount of suspicion for many of our paranoid patients as they didn't trust the 'device' we were sticking in their ear." Other statements, such as the one that follows, placed nurses squarely in the context of the nursing situation:

Completing a comprehensive health history on my willing volunteer proved to be a very valuable and interesting experience. It not only reinforced some of the skills I already use, but refreshed other areas that I may not have had the opportunity to utilize very much in my current practice.

Finally, statements reflected aesthetic knowing that considers how the other person is feeling. For example, "These symptoms, although not causing any immediate distress to Mr. B. , have caused him enough concern to talk about them at this annual assessment, which leads me to believe that he is worried."

Personal Knowing

Personal knowing differs from the feeling aspect of aesthetic knowing in that it is almost always about the self and often attempts to answer questions such as, "How did I feel in this situation?" and "What internal factors influenced my behaviour?" The following comment clearly illustrates one nurse-participant's sense of self in relation to a clinical situation that had the potential for personal embarrassment:

I thought that I had gotten over feeling embarrassed about asking personal questions . . . I really felt this was the most difficult part of the interviewing process for me and my discomfort probably made it harder on the volunteer as well.

Although some of the participants' postings revealed personal knowing, these were fewer in number than those demonstrating aesthetic knowing. This may be due to the fact that, in nursing, a patient's needs and feelings are put first and the caregiver's second.

Ethical Knowing

Ethical knowing deals with the congruency between a nurse's actions as a professional and his or her personal value system. It involves wrestling with questions such as, "How did my actions match my beliefs?" and "What factors made me act in ways that do not fit with my values?" An example of this way of thinking is evident in the following statement:

One of the challenges that an interviewer may encounter is when the patient describes something in their life that conflicts with your own values or morals . . . such as teen pregnancy, abortions, sexual orientation, use of cigarettes, alcohol, or street drugs, or a person's choice to refuse blood transfusions.

Another example of a nurse-participant's experience of ethical knowing was found in this posting:

Do you think this is ethical practice [kissing foreheads to assess temperature] or is it violating patients' rights? I have been doing this for 35 years and have never been denied a forehead; in fact, most patients give me a beautiful smile and a thank you.

In this case, one nurse's personal values and practices require special reflection, given the ethical rights of another person within the context of a professional relationship.

Empirical Knowing

Nurses involved in a situation requiring empirical knowing consider how nursing knowledge informed (or should have informed) their practice. Understandably, given the topics covered in the module, many examples of this way of knowing were found among the participants' postings.

On a different but related note, on a per student basis, the average number of postings (formal and informal) appeared to relate to evidence of ways of knowing. Students who posted more messages tended to demonstrate greater evidence of the four ways of knowing in their writing than did their

peers who posted fewer messages. This finding suggests that prolific participants take more opportunities to display their thinking but may or may not be more critical thinkers than their counterparts. At very least, it suggests that, in an online learning setting, writing is the principal way by which learners do their thinking and demonstrate it to others.

Based on the informal personal introductions posted by the nurse-learners, little evidence existed that participants' years of experience influenced the ways of thinking they demonstrated in their writing assignments. Nurses with limited and with more-extensive years of experience displayed all four ways of knowing in their formal assignments. By contrast, selection of topic did appear to have an effect. As already noted, cardiovascular and integumentary-based topics tended to elicit more empirical thinking than did those involving medical history and case studies. In general, these latter topics led to different kinds of knowing.

Instructor-Guided Thinking

Instructor-guided thinking is not described by Carper (1978) or by Johns (1995). However, it was clearly evident in this study's findings and is not unrelated to the discussion of critical thinking through reflective writing in an online nursing education setting. Generally, this kind of thinking occurred when the instructor stepped in to redirect or refocus a discussion. The example that follows is one of many that illustrated how a skilful instructor can affect student thinking.

Instructor: You have identified an area that many people have difficulty with, asking questions of a sexual nature . . . So, my message is to try asking about it . . . the more practice the more comfortable you will become . . . A question to the group, how many of you have tried asking questions about sex? What has your experience been?

General Interaction Among Learners

Among the participants' informal postings were many unique communication and support experiences. For example, students developed strong and extensive networks of peers and mentors, which often provided practical support around the learning process, general moral support, and technically helpful ideas. The following excerpts indicate how their relationships and interactions promoted learning and fostered support.

Student: I thought everyone might like to know how good they [suggested websites] look! . . . I particularly enjoyed reading all the communication and interviewing sites . . . I'd be interested to hear what anyone else thinks, or if you find other sites that are applicable to us! (promoting learning)

Student: Just a short note to tell everyone what a wonderful job they have done with the first bulletin board. I have enjoyed reading them (finally had time to do it!). I'm glad to be a part of this group!! (extending moral support and expressing appreciation)

Evidence of Thinking Affecting Clinical Practice

One of this study's objectives was to identify whether the critical thinking demonstrated by the participants in their online writing assignments affected their nursing practice. Although not the case for every nurse-participant, on several occasions, there was evidence to suggest that what a nurse was learning in the module may have affected her clinical practice. Statements like the one below occurred frequently.

Student: I have learned a lot about myself and about the volunteer I practiced on for this assignment, as well as gained insight into practices that occur daily in our work lives. We do or do not do some things without conscious thought because that is the way it has always been. I look at this [course] as an opportunity to challenge myself by addressing some of these practices in my own workplace.

Growth as Discipline-Specific Writers

The third objective of the study was to examine the nurse-participants' growth as discipline-specific writers. Because of their ages (31 to 60 years), it was reasonable to assume that many of them had not undertaken university-level writing assignments for some time, if ever.

The participants' novice and/or rusty writing skills were strongly evident in the first round of formal postings. Several of them posted writing assignments that displayed a complete unfamiliarity with APA writing conventions; in other instances, postings lacked the writer's individual voice that is crucial to a written text. Interestingly, this finding appeared to connect to the presence or absence of different ways of knowing. Those who displayed more and different ways of knowing tended to produce higher-quality writing assignments than did their peers.

Although the issues of writing conventions and APA style were handled better in the second set of postings, content wise, nurse-participants continued to rely heavily on information taken from books and journals. At the same time, some made positive progress in integrating research-based findings with practical knowledge based on nursing experience.

FINAL THOUGHTS

The online nursing health assessment project was effective in facilitating the continuing learning of registered nurses and in providing a forum that encouraged critical thinking through reflective writing. Six distinct points based on the findings of this study are offered to support this view.

1. Critical thinking based on different ways of knowing, as demonstrated through reflective writing, can occur in an online nursing education setting through asynchronous discussion activities.
2. There did not appear to be a relationship between years of nursing practice and the practice of critical thinking, as displayed in the study participants' writing assignments.
3. There did appear to be a strong relationship between writing topics and different ways of knowing and thinking.
4. There was some suggestion that nurse-participants were applying what they learned online in their clinical practice setting.
5. Interaction with the instructor and fellow participants appeared to influence the nurse-participants' comfort level within the online setting and, possibly, their experience of thinking about content.
6. The online learning setting showed potential for facilitating learners' growth as discipline-specific writers.

Given these observations, it is anticipated that other online nursing education courses and projects will aggressively tap the potential of the Internet-based learning environment to support adult learners in thinking reflectively and critically about the theory and practice of their learning.

The success of the project and the study—including its high completion rate and the generally positive feedback from participants—underscores the tremendous potential of Internet-based environments for teaching and learning in specialized nursing education areas. Although the challenges of online education are genuine, its possibilities are significant, and in this period of sustained flux in health care, the opportunities for Internet-based nursing education merit further exploration.

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