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Online education for Ontario's registered nurses: An examination of critical thinking.

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Online Education for Ontario's Registered Nurses: An Examination of Critical Thinking

by

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ABSTRACT

The purpose of this study was to explore critical thinking dispositions in an online nursing education context in which writing was the principal means of communication. Writing samples generated by participants were also examined for evidence of critical thinking skill and writing competence. A nursing education setting was selected for the study because of the growing popularity of online nursing education.

A mixed methods design was utilized. Analyzed data included the following: scores of 84 students on a critical thinking inventory called the California Critical Thinking Inventory (CCTDI); scores assigned to written work by student-participants; data generated by analysis of writing samples; data generated through interviews; contributions to course bulletin boards; and observations made by the researcher.

There were no statistically significant increases in the participants' overall measures of critical thinking dispositions as a function of online study. A time interaction effect suggested that students generally show gains in a critical thinking disposition called truthseeking as a function of university experience.

Findings related to self-confidence and writing point to differences between younger and more experienced nursing students. In the precourse context, the more experienced nurse-learners' self-perceived competence in writing was lower than that of the undergraduate nursing students. The online course experience appeared to mitigate this difference. This improvement in self-confidence in writing did not correspond with high scores by the more experienced nurses when their writing was assessed for evidence of critical thinking. Analysis of the writing samples for general writing competence revealed stronger writing by the younger nursing students. Consideration of the writing for evidence of different ways of thinking based on an adaptation of

Johns' (1995) ways of knowing suggested a relationship between assignment design and kinds of thinking.

The qualitative findings suggest that working nurses choose online education generally because of the access and flexibility it provides. Online educational settings do appear to pose challenges for these learners including issues related to time management and navigation of the online environment. Mixed opinions regarding the use of asynchronous bulletin boards and the rigors of discipline-specific writing are suggestive of the challenges experienced by these learners.

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DEDICATION

This project is dedicated to my parents Tom and Lillian Harrington.

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Introduction

Background

Since the mid- to late-1990s, nursing in Ontario has witnessed significant growth in its use of computers and Internet-based technologies. This growth is demonstrated in several ways including computer use for patient charting and general data entry as well as patient and practitioner education. Occurring over the same general time period, Ontario's decision to implement—beginning January 2005—a baccalaureate entrance-to-practice requirement for nurses came into being. Because only 20% of Ontario nurses held university-level status when the Council of University Programs in Nursing (COUPN) first made this announcement in 2000, the need to design, develop, and deliver innovative BScN programs for post-RN nurses was a challenge for Ontario's schools of nursing (Council Highlights, May 2000). Distance-based nursing programs including online educational strategies were identified as an appropriate way of responding to this need (Council Highlights, May 2000). As critical thinking also experienced a surge in educational attention during the same time period and is an important component of the nursing process, the combination of critical thinking and online nursing education is the focus of this study. The next section of this chapter outlines several important distinctions regarding critical thinking.

Critical Thinking Terminology

While multiple definitions of the term critical thinking are found in the nursing education literature, the following definition was used in this study: critical thinking means giving consideration to evidence as well as relevant contextual information, theories, methods, and criteria. The outcome of such consideration is the formation of judgements (Facione, Facione &

Giancarlo, 2000). Simply stated, it is the process of using reason to decide what to believe and to do (Ennis, Millman & Tomiko, 1985).

While the above definition is straightforward enough, there are important distinctions to be made between what are called critical thinking skills and critical thinking dispositions. The former pertain to specific thinking applications; the latter to character tendencies to think and act critically. Because of the inherent limitations of the online learning setting to track, measure, and validate the critical thinking skills of nurse-learners, critical thinking dispositions were selected as the primary focus of this study although the study also included strategies that assessed for critical thinking skill through writing. The study further considered participants' demonstration of writing competence.

The specific critical thinking dispositions explored in this project are based on distinct character attributes as suggested by Facione, Giancarlo, Facione, and Gainen (1995). Sometimes called habits of mind, they include truthseeking, openmindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, and maturity in judgment.

Purpose of the Study

As previously indicated, online education in nursing is on the rise just as critical thinking is regarded to be the foundation of the clinical reasoning process that nurses use every day. Also found in the nursing education literature are extensive discussions of relationships involving critical thinking, reflection, and writing. Reflection is repeatedly identified as a strategy vital to the development of critical thinking among health care practitioners (Daroszewski, Kinser & Lloyd, 2004; Kennison & Misselwitz, 2002; Kessler & Lund, 2004; Smith & Johnson, 2002) while university-level, online education courses often use writing as a primary learning methodology (Anderson, 2003; Garrison & Anderson, 2003). As a result, educational researchers need to explore and understand the relationship between writing, critical thinking, and online

education. The purpose of this study then was to bring together all of these elements so that an understanding of the online nursing education setting as a possible facilitator of critical thinking emerged.

The Learning Theory of Constructivism

As a learning theory, constructivism has been described as an experience in which there is, above all, an internal orientation to learning. In addition to being a pervasive learning theory in contemporary education in general, it has assumed a primary position in describing and explaining online education. As a result, it is presented as the theoretical framework for the study. Before exploring this theory more fully, it is valuable to position constructivist learning theory in juxtaposition with its two major counterparts: behaviourism and cognitivism.

In behavioural learning theory, the concern is learner performance. Based on Skinner's (1938) premise of operant conditioning, learning is regarded to be a conditioned response to a stimulus. By comparison, cognitive learning theorists are interested in the changes that learners experience in their brains. Sometimes called information processing theory, cognitivism emphasizes complex intellectual processes such as thinking, language acquisition, and problem-solving.

While regarded by some to be a new theory of learning, constructivism has longstanding roots including its manifestation in what was called discovery learning. Simply put, the driving principle of constructivism is that knowledge is individually and /or socially constructed by learners based on their interpretations of their experiences. Given this understanding of learning, knowledge is not that which is transmitted. Instead, as Seels says (1989), "learning occurs because personal knowledge is constructed by an active and self regulated learner...who reflects on theoretical explanations" (p. 11).

As suggested, the history of constructivism is richer and longer than some know. With roots in both philosophy and psychology (Doolittle, 1999), it has been suggested that constructivism is, at the same time, "a theory of learning and... a theory of knowing. It is an epistemological concept that draws from a number of fields..." (Walker & Lambert, 1995). Historically, constructivism has been the preoccupation of many great thinkers. The fathers of constuctivism by their chronological place in the history of constructivism include Vico (1668-1774), Rousseau (1712-1778), Kant (1724- 1804), Hegel (1770-1831), Froebel (1782-1852), James (1842-1910), Dewey (1859-1952), Montessori (1870-1951), Vygotsky (1896-1934), Piaget (1896- 1980), Rogers (1902-1987), Bruner (1915-), and von Glaserfeld (1917-).

While each of these thinkers has made unique contributions to the evolution of the theory of constructivism, the contributions of Piaget, Vygotsky, and von Glaserfeld stand out. Brief discussions of the contributions of each are presented in the next few paragraphs.

Recognized for his work in what is called developmental constructivism, Piaget first introduced the term constructivism to psychology and focused on knowing rather than being. In Piaget's world of cognitive constructivism, cognitive development is facilitated by providing the learner with activities and situations that engage the learner and require adaptation. Teaching materials should actively involve students and present challenges although they should not force the learner to reach beyond his or her cognitive abilities.

Vygotsky, on the other hand, is remembered for his contributions to social constructivism. According to Vygotsky, culture and context are extremely important in shaping understanding. Vygotsky also favoured the concept of learning as a social construct enabled by language and discourse. Social interaction is central to the learning experience and, at their most intense, social constructivists maintain that teaching and learning are ends in themselves (Prawt

& Floden, 1994; Henriques, 1997). Only after a new idea or theory has been negotiated through a peer consensus process is it considered legitimate.

Glaserfeld is affiliated with another form of constructivism called radical constructivism. At the end of the constructivism continuum, radical constructivism holds that there is no indisputable world—no objective reality. As suggested by Jonassen (1991), "there is no single entity or any objective entity that can be described in any objective way; rather the real world is a product of the mind that constructs that world (p. 29). Based on this understanding of the world and learning, the role of the teacher and the learner is affected so that every person's understanding of the learning experience is equally valid.

One other form of constructivism of note is critical constructivism. A product of postmodernist thinking, this theory came of age in the 1960s when academics began to explore new ways of thinking within the social sciences (Kincheloe & McLaren, 1994) which, for some, led to a condemnation of the positivist conception of science and rationality (Schwandt, 1990) and epistemological uncertainty (Kincheloe & McLaren). What this meant for teaching and learning was recognition of different realities not only for different individuals but also within the same individual.

In summary, according to Fosnot (1996), the principles that define constructivism to different degrees depending on the kind of constructivism are as follows:

> *Learning is development. It is not the result of development*: As such, it requires invention and organization on the part of learners. The instructor needs to encourage learners to raise questions, generate hypotheses, and test them.
>
> *Disequilibrium facilitates learning*: Contradictions and contrary perspectives should be explored and discussed.

Reflective abstraction is the driving force of learning: Humans seek to organize and generalize their experiences. Reflection time including activities such as journal writing may enable this abstraction.

Dialogue within a community engenders further thinking: Learners need to be provided opportunities to defend, prove, and communicate their ideas with others. Through this kind of activity, ideas may come to make sense to the community and, in turn, be accepted.

Learning proceeds towards the development of structures: As learners make meaning, structural shifts may occur and important "big ideas" emerge (Schifter & Fosnot, 1993). Typically, these ideas are organizing principles that can be generated across experiences and often require revisiting earlier conceptions.

Online Education and Constructivism: Experience to Date and Design Issues

With the rise of online education, constructivism has found a home unlike other educational venues. As Ally (2004) points out, many teachers and educational researchers have found the online classroom to be the ideal arena for exploring the assumptions and principles of constructivism. Additionally, the online learning setting has been demonstrated to be a place where knowledge can be constructed through interaction with other students as well as with the instructor (Murphy & Cifuentes, 2001). It is similarly an environment where collaborative and cooperative learning can be accomplished and where learners can use their personal cognitive skills while learning from others (Hooper & Hannafin, 1991; Johnson & Johnson, 1996; Palloff & Pratt, 1999). This noted, while the Internet-based learning setting can be a place where

learners make uniquely personal learning decisions, such learning generally occurs with guidance and input from the instructor.

Recognizing the independence that online learners often have, Internet-based education offers unique occasions for personal reflection. As in the case of interaction, this reflection does not simply happen; rather, it is generally prompted by embedded questions and learning activities that the teacher has selected so that learners process information in meaningful ways. Counterbalancing the independent reflective experience are the aforementioned opportunities to connect with other learners and develop a sense of community. It is within this community that learners test and confirm ideas and apply their knowledge (Ally, 2004).

Because the online educational milieu is an opportune setting for constructivist-based learning, some educators have argued that there is an inherent contradiction in the idea of designing for constructivist learning. As Airsian and Walsh (1997) point out, the "constructivist model is descriptive, not prescriptive." Similarly, it is difficult to define instructional strategies that always support constructivism" (Miller, 2002).

While the conflict between constructivist theory and designed instructional events is recognized on a conceptual level, the researcher proposes that learning settings that foster constructivism do require design, albeit design towards knowledge construction in contrast with knowledge transmission. While there is no "cookbook approach" to how to do constructivist learning, the literature does identify "methods and strategies that are more likely than others to foster the desired traits in students such as knowledge construction, intrinsic motivation, independent learning, and responsibility" (Dobozy, 1999, p. 33). Interestingly, it has been noted that even lectures which are typically associated with a transmissive model of education "can potentially support student construction of knowledge" (Miller, 2002, p. 3). In the case of a text-

based online course, content-oriented notes prepared by the instructor may be likened to lecture-like experiences.

The field of constructive learning and instructional design is one that instructional designers and content experts will likely struggle with for some time. This is due to the newness of the field and the fact that constructivism may not be fully compatible with all aspects of the "present systems approach to instructional design" (Mergel, 1998, p. 21). This noted, there is important work happening such as that by Cunningham, Duffy, and Knuth (1993); Honebein (1996); Jonassen (1991a, 1991b, 1999); Moallem, 2001); Murphy, (1997); and Wilson and Cole (1991). Jonassen, for instance, points out that designing for constructivist learning requires dedicated focus on the learning environment. This design emphasizes internal and social negotiation, exploration of real-world contexts through case-based problems with the uncertainty and complexity of real-world practice, and teacher modeling and facilitation in contrast with teacher purveying of information. As a result, the teacher assumes the role of co-learner although this researcher also suggests that, in his or her role as co-learner, the teacher should also be encouraged to assume the roles of challenger and coach. Assumption of the former role by the teacher helps guard against situations where there may be failure to examine and disassemble positions that may be faulty in logic or based on inaccurate information. In other words, by encouraging learners to challenge and test constructions and to abandon them when they are found to be flawed, the instructor assists in facilitating learning characterized by academic rigor and discipline. By comparison, the role of coach is very important in a constructivist-based learning setting given that this kind of setting may be disorienting to the learner who is accustomed to a more transmissive setting and who may feel uncertain about how to proceed. For example, the constructivist-based learning situation is likely to be a less linear and more diverse experience than other learning settings. As such, it is helpful to the learner when his or

her teacher provides advice about exploring the setting and acts as a guide and assistant (Prossner & Trigwell, 1999; Marton, Hounsell & Entwistle, 1997).

Synthesizing the aforementioned ideas, Wilson (1997) suggests that, in today's information age where constructivism is such an important learning framework, instructional design can be considered in the following ways:

> *General ID Approach*: Stretch the rules; put principles before practices; put learners and teachers above principles
>
> *Needs Assessment*: Resist the temptation to be driven by easily measured and manipulated content; ask who determines instructional needs; ask whose needs are being served and whose needs are being neglected
>
> *Goals, Objectives, Task Analysis*: Allow learning goals to emerge during instruction; use objectives to guide design; define content in various ways and present through cases, stories and patterns
>
> *Instructional Strategies*: Support learners in pursuing their own goals; design learning environment, not instructional events; consider instructional strategies that provide multiple perspectives and encourage learners to exercise responsibility
>
> *Media*: Include both media literacy and media biases for consideration; provide opportunities for learners to use media in their pursuit of understanding
>
> *Evaluation*: Critique and discuss products and performances grounded in authentic contexts; used, where possible, informal assessment within the learning environment

Constructivism and Nursing Education

The combination of constructivist learning theory and nursing education is one that merits careful consideration. Certainly there will be individuals who will suggest that nursing education is a discipline in which learners require exposure to learning that is transmissive and highly experiential in nature so that they acquire the scientific knowledge base that is integral to nursing practice as well as the skills of safe and competent nursing practice. In fact, the researcher agrees with both views. Nevertheless, she does not perceive an inherent contradiction between constructivist learning and learning activities rooted in the theories of transmission and experience. As noted earlier, a lecture delivered in a transmissive way can be a valuable way of building knowledge; an experience-based learning session can also build knowledge. Thus, a course or program rooted in constructivist learning theory need not exclude learning activities and assignments defined by other learning theories.

At the same time, the researcher suggests that, in nursing education, a constructivist approach will be more appropriate in some contexts rather than in others. In the determination of which contexts are best suited for a constructivist framework, both content type as well as the composition of the nurse-learner group itself must be considered. For instance, in this study, the curriculum studied by the experimental group included topics such as care of healthy individuals and families, teaching and learning with families, and the practice of reflection as an enabler of critical thinking in nursing. The course did not focus on data-intense areas such as pharmacology or hands-on skills. Rather, the course explored content where it is valuable for learners to construct knowledge in individualistic ways and where there is no risk to patient care. Considering the course at its instructional level, it included learning activities and assignments that lent themselves easily to a constructivist model. For instance, the nurse-learners were encouraged to complete learning activities that involved posting reflections and responses to a

threaded bulletin board and to learn from each other by interacting and commenting on each other's work. This use of writing to facilitate reflection on one's own thinking in addition to the thinking of others is in line with the principles of constructivist learning.

Additionally, the learners in the experimental group were post-RN nurses—that is registered nurses who had returned to university for baccalaureate study—rather than younger students who were studying to become nurses. As such, the principles and practices of andragogy would have surely affected their learning experiences. Having acquired mastery of the essentials of nursing practice in previous learning settings, these learners had unique needs based on their more advanced life and professional stages than the undergraduate students involved in the study. Not insignificant among these needs may have been the need to construct knowledge in relationship with personal and professional values acquired over time.

Finally, it is important to recognize that, as Watson (1999) has suggested, there are certain areas of nursing where multiple truths may exist. Historically, while nursing education has been regarded to be a discipline in which individuals were trained according to externally defined standards, nursing education is now principally positioned within universities. In Ontario, when nursing education occurs in the community college setting, there is always a collaborative relationship between the involved college and a university so that resulting degree is granted by a university. While external standards will always be a central element of nursing education, these standards co-exist with mandates that require nurse-learners to become strong competent critical thinkers who can build their own knowledge and arrive at decisions and actions rooted in the best of critical thinking practice. Additionally, nurse-learners need to possess habits of mind or critical thinking dispositions that predispose them to think critically in the first place.

A Theoretical Model for this Study

As the previous discussion has outlined, this study uses constructivist learning as its theoretical scaffolding. Additionally, the elements of reflection, writing, distance education, online learning, andragogy, and critical thinking (dispositions and skills) are brought together in the study. Learning activities grounded in transmissive and experiential learning are also identified as possible components of a course or program that is constructive in nature. While not a theoretical component of the study, the relationship between instructional design and constructivist learning is a further piece of the study. Figure 1 provides a pictorial representation of the theoretical framework that supports the study while Chapter 2—in its review of relevant literature—offers a closer look at the various elements of the framework.

Significance of this Study

There is little question that online education has assumed a central position in university education. While it is occurring in many disciplines and subject areas, it is extremely valuable for nurses studying at the postcertificate level—in Ontario, those nurses pursuing BScN standing as a result of the new baccalaureate entrance-to-practice requirement as well as other nurses who are seeking to meet their continuing education needs. For nurses, online courses and programs offer an accessible and flexible educational experience not always found in face-to-face and other distance and distributed educational contexts. Access and flexibility are necessary attributes of nursing education at the post-RN level because this learner group is generally employed and often carries family and community responsibilities. Other benefits of online nursing education have been identified as well: for example, today's nurses are using technology—and computers in particular—on a rapidly increasing basis. With unprecedented

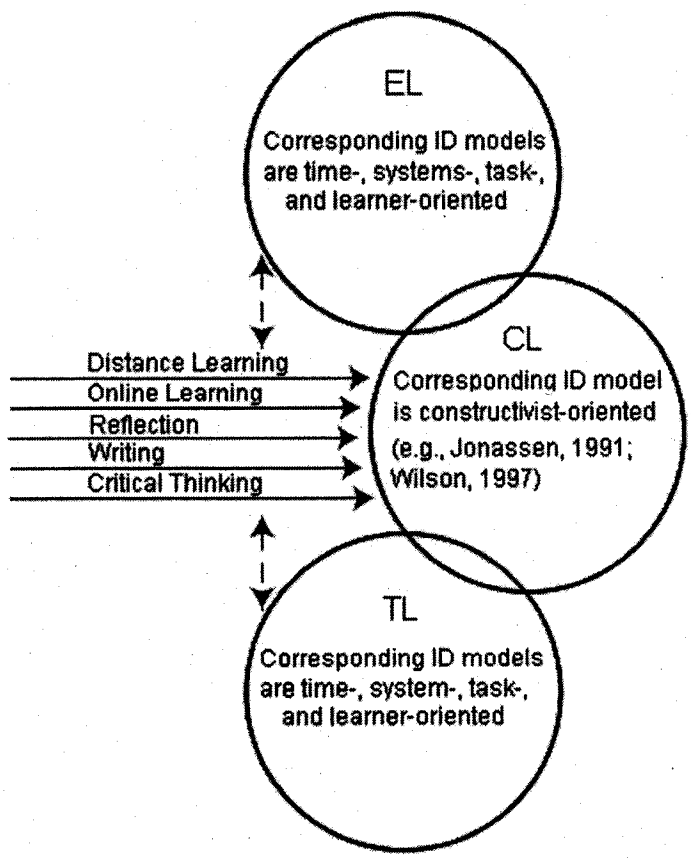

Figure 1. An inclusive constructivist theoretical framework coalescing from competing models and constructed variables

NOTE: EL = experiential learning; CL = constructivist learning; TL = transmissive learning
ID = instructional design

Solid arrows represent "influence/impact on." Broken arrows represent "borrowing components from."

changes in health care and rapid generation of information, the combination of nursing education and technology is powerful.

At the same time, the investment on the part of the nurse-learner, the instructor, and the instructional unit supporting the online experience is typically substantive. The nurse-learner may have no previous experience with online education and may, therefore, have a steep learning curve concerning the use of technology for educational purposes. Training in writing at the university level and information gathering in today's technology-mediated university libraries and electronic databases may also be required. On a very practical front, the nurse may be handicapped because of weak keyboarding skills. To meet these challenges, the nurse generally requires a strong support system at home, work, and the university.

The online instructor, by comparison, may require support in adapting existing content for a technology-based educational setting and training in appropriate use of educational technologies and modification of teaching strategies. This type of training entails institutional and personal commitment to faculty development as well as time and money. Furthermore, the emerging literature regarding online education and workload indicates that workload can be very heavy in an online course because of students' ongoing contact with their instructors through communication technologies and the need to put most messages into written format (Cravener, 1999; Morris, Buck-Rolland & Gagne, 2002).

These design, training, and support issues, in addition to requiring time and energy investments by individuals, necessitate resources at the institutional level. Instructional designers, educational technologists, multimedia experts, and technical support staff represent some of these supports. Thus, nursing education units and other professional schools delivering online education are faced with the challenge of weighing the access and flexibility benefits of online education for working adult learners against the investments. Thus, if it can be shown

through research that the online learning setting with its emphasis on written communication can support a learner's experience of critical thinking, faculties and schools engaged in online education will have acquired the important scholarly-based evidence they need to justify the resources that online education requires. Other findings of this research may influence the instructional design process as it is brought to online course development. Finally, the study may make a contribution(s) to the advancement of constructivist learning theory as it is presently being implemented in online nursing education targeting experienced nurse-learners.

Chapter II

Literature Review

Ontario-based Nursing Education: An Overview

More than ever before, registered nurses in Ontario are seeking baccalaureate-level education through online distance education. This same trend is evident among nurses as they strive to meet their continuing professional development (CPD) requirements. Two reasons for this surge in educational activity are Ontario's 2005 baccalaureate entry-to-practice requirement and the circumstance that nursing is a constantly changing field.

With respect to the 2005 baccalaureate requirement, the numbers of Ontario nurses currently seeking university-level education are substantive. For example, in Spring 2000 when the baccalaureate requirement was first announced, only 20% of all nurses in Ontario graduated with a baccalaureate degree while 80% graduated with a nursing diploma (Council Highlights, May 2000). In order to compete for positions of leadership and responsibility with their younger colleagues, many nurses who graduated before 2005 are now pursuing their degrees.

The recent increase in continuing education activity for nurses is related to the fact that health care is a dramatically changing field in which nursing professionals have little choice but to keep up. There are also incentives related to salary increases and promotion opportunities. The results of this situation are apparent in the unprecedented numbers of nurses taking additional courses, programs, certificates, and other forms of instruction (Canadian Nurses Association, 2003).

Nursing leaders offer yet another important perspective on the issue of nursing education in Ontario today. At an international conference called Embracing the Future: Educating Tomorrow's Nurses (October 24-25, 2002, Toronto) hosted by the Registered Nurses of Ontario (RNAO), some 300 nurses and nurse educators shared ideas about the role of education in the

future of nursing. Both keynote speakers—Dr. Afaf Meleis, Dean of Nursing at the University of Pennsylvania and Dr. Dyanne Affonso, Dean of Nursing at the University of Toronto—spoke strongly about addressing the current crises in nursing through education (2002). Education, Affonso pointed out, is integral to the shift that needs to happen in nursing to lift it out of its current dysphoria or down feeling. Also according to Affonso, nursing education is important to the achievement of safe patient care and it must occur in "new, different, and innovative" ways (2002).

While most registered nurses are aware of the educational opportunities available to them, accessing them can be a complex undertaking. This situation occurs because most adult learners—and especially nurses—juggle very busy lives. For this reason, online distance education with its flexibility around time and place is growing rapidly in popularity among nurses. Historically, nurses have been seen as reluctant users of computers and other technologies (Gibson & Rose, 1986). This situation changed, however, in the late 1990s, making the combination of Internet technology and nursing education a powerful one. A distinctly important outcome of this phenomenon is enhanced skill with computers among nurses. This is significant as more and more nurses are being required to use the computer in their daily clinical practice (Bachmann & Panzarine, 1998; Billing, 1999). By contrast, whether or not Internet-based instruction supports development of nurses' critical thinking dispositions and skills is an area requiring further study.

Who is Ontario's Post-RN Nurse?

Nurses represent a unique learner group within Ontario's working population. The principal reason for this is that nursing continues to be a female-dominated profession with the large majority of its membership trained by Ontario's community college system. As women, nurses frequently hold other fulltime roles as wives, mothers, and active community members

(Andrusyszyn, Cragg & Fraser, 2005; Billings & Rowles, 2001; Bonk & King, 1998; Fraser, Cragg & Andrusyszyn, 2003). One nurse-learner taking elective credits for her post-RN degree through distance education at Laurentian University in Sudbury, ON, describes her experience this way: "I mean I'm still struggling with the idea of studying, of committing [the] time....it's a struggle" (Carter & Rukholm, 2002, p. 2).

The literature calls these challenges disincentives (Leonard, 2003). In addition to those already noted, disincentives can include financial concerns, difficulties with academic credit transfers, non-availability of courses in areas of personal and professional interest, inadequate access to support services, and geographic inaccessibility (Leonard, 2003).

As complex as the life and work responsibilities of nurses are the factors that influence the implementation of new knowledge into clinical practice. For example, nurses may not make new knowledge a priority in clinical practice if they question that the benefits of using this knowledge are greater than the barriers associated with its implementation (Barriball, While & Norman, 1992). Such barriers may include resistance to change among colleagues, inappropriate infrastructure, and inadequate resources. In addition, nurses who lack positive reinforcement for their studies from supervisors, peers, families, and others may not share their new knowledge with peers and/or integrate this new knowledge into clinical practice. Nurses who perceive their new knowledge as threatening to their control of nursing practice or to their values may be reluctant to use new knowledge (Barriball, While & Norman, 1992). In other words, the nurse-learner needs to perceive the relevance of learning to clinical practice and experience support at several levels. This way, the nurse is likely to feel positively about what he or she is learning and how it connects to the nurse's work as a caregiver. Unfortunately, these circumstances and perceptions do not always blend.

None of this is surprising given the more general principles of adult education. For

instance, Knowles (1975, 1980), regarded to be the author of the term "andragogy" or adult education, refers to adult education as a process experience rather than a content event. As a result, adult learners tend to be proactive and exhibit the characteristics of self-responsibility and self-direction. In general, they are problem oriented and desire information that is realistic and applicable to their lives.

Creating a setting that facilitates this kind of educational experience in a "supportive and caring atmosphere" (Cranton, 1994, p. 197) when distance and technology are involved is a unique challenge. For example, distance invariably complicates the development of relationships and the intricacies of process learning. Nursing is a specialized discipline: although process learning and community building should, ideally, be cultivated in every nursing education setting, nursing courses may include content that makes this difficult. Faced with the choice to foster community or to deliver content, the nursing instructor working at a distance will likely choose the latter—he or she needs to know that students are taking away the content they need to practise safe patient care.

Distance Education in the 21st Century: Context for Online Nursing Education

In recent years, distance education, like nursing education, has evolved quickly. Originally conceptualized to serve the learning needs of individuals who lived at a geographical distance from the educational provider, Western-based distance education has progressed away from one-way correspondence-type learning and towards interaction and communication strategies hitherto not possible (Bates, 1995, 2000). The computer, the Internet, and technologies such as videoconferencing and web casting are the methodologies of contemporary distance education.

Administrators in present-day distance and continuing education units across Canada typically report that the students enrolled in their courses include two main kinds: students from

remote and rural areas and students from the local community (B. Brockerhoff, personal communication, May 10, 2005). This latter group includes those who may be geographically able to come to campus but who, for other reasons including time, cannot or prefer not to do so. Distance, therefore, is no longer something strictly physical; instead, a more appropriate definition of distance education speaks about barriers to education including time and lifestyle as well as distance.

To summarize, online nurse-learners—despite obstacles such as geography and time constraints—are seeking educational opportunities related directly to their personal and professional learning goals. In addition to baccalaureate training, these goals include enhancement of 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). Among the possible options, online nursing education stands out for its accessibility, flexibility, and diversity.

Today's "brand" of distance education can offer nurses many unique and flexible options that enable the following:

- learner engagement and experience with high quality learning materials and activities; examples include notes and resources prepared by a nursing content expert, course- and discipline-specific graphics, sound and audio clips, instructor-selected web links, interactive demos, simulations, and so forth (Bonk & King, 1998; Harasim, Hiltz, Tele & Turoff, 1996)
- different kinds and levels of interaction through synchronous and asynchronous strategies among students; between the instructor and the student; between the instructor and a group of students; between a member of the learning support staff and the student; between a member of the learning support staff and a group of

students; between the educational interface and the student (Billings, 1999; Bonk & King; Carter & Rukholm, 2002; Cragg, 1994a, 1994b; Harasim et al., 1996)

- multimedia-based learning resources including clinical databases and simulations reflecting real-world practice (Billings)
- opportunities for self-assessment as well as formative and summative assessment
- opportunities to participate in scholarly discourse (Carter & Rukholm).

Instructional Design Issues in Online Nursing Education

As suggested in Chapter I, most learning experiences are theoretically positioned within the context of one or more learning theories. Extrapolating to the more practical front, specific educational sessions such as courses tend to be enabled by a practice known as instructional design: important to this study is that online education is no exception. Regarded as procedural frameworks for the systematic production of instruction, models of instructional design, by definition, analyze the intended audience and assist in the establishment of appropriate learning goals and objectives. An instructional design model provides structure and meaning to a learning problem or challenge and, ideally, facilitates valuable and effective teaching and learning.

Recognizing that the complexities of designing for constructivist learning have led to the development of new instructional design models and acknowledging the concerns that some educators express about constructivist-based learning and specialized subject areas such as nursing (Chapter I), this researcher—based on her background as an instructional designer in the nursing education field—suggests that the more traditional instructional design models still hold a place of importance in facilitating online nursing education. Four of the more traditional models to instructional design that hold meaning in the online nursing domain are systems-, time-, task-, and learner-focused models. Key experts in each of these domains and how their respective approaches to instructional design pertain to online nursing education are considered

in the following paragraphs.

Systems-oriented instructional design. Instructional design that is systems-oriented includes stages or phases. For instance, the Dick and Carey (1996) design model begins by identifying instructional goals and ends with summative evaluation. The Hannafin Peck (1987) model is a three-phase process including a needs assessment stage, a design phase, and a development/implementation phase. In all phases, there is a process of evaluation and revision. The Knirk and Gustafson (1986) model also advocates a three-stage process: problem determination, design, and development.

Although regarded to be systems-oriented, the Kemp (1994) design model takes a more holistic approach than other systems-oriented models. Under this model, virtually all factors in the learning environment are taken into consideration: content, learner characteristics, learning objectives, teaching activities, resources (computers, books, etc.), support services, and evaluation. Two additional systems-oriented models are the Gerlach and Ely (1980) Design Model and Tripp and Bichelmeyer's (1990) Rapid Prototyping Design Model. These latter two models tend to be used in very specific contexts: the first within the kindergarten to senior high school levels, and the second for discrete lessons rather than entire curricula.

Time-oriented instructional design. In this category of design theory, time is the most important component of the instructional experience. Carroll (1963), for example, proposes that learning is a function of time and that time is a function of two variables: opportunity to learn and perseverance. Based on Carroll's model, Berliner's (1979) model emphasizes the construct of opportunity to learn and arrangement of instructional situations.

Huit (1995) proposes that instruction is about something called output: specific measurement or measurements of learning (e.g., student achievement, social skills, cognitive development, etc.). Huit further examines the role of context in learning, proposing that

environmental or situational factors such as the home and changing global conditions influence the measurement of educational outcomes in addition to levels of input and process variables. In Huit's theory, input refers to the characteristics that teachers and students bring to the teaching/learning process. The instructional process, by comparison, involves the thoughts, feelings, commitments, and actions of teachers and students within the classroom or learning situation, interaction patterns, and descriptions of the learning environment that result from interaction.

Bloom's (1976) well-known time-oriented model goes a step further and considers the role of attitudes in the instructional process; such attitudes include attitudes towards the subject matter, the school, and the self as a learner. Influenced by Bloom and Carroll (1963), Harnishfeger and Wiley's (1976) theory focuses on background characteristics, the teaching and learning process, and outcomes. More specifically, this model suggests that learner outcomes are directly influenced by pupil pursuits. Teacher and learner time and personal characteristics are key elements.

Task-oriented instructional design. Bruner's (1966) task-focused model outlines step-by-step procedures that facilitate learning. Acknowledged as an outgrowth of cognitive development theory, Bruner's theory argues for three modes of representation and points out the close relationship between cognitive development and theories of instruction.

Gagne's (1987) three-part, task-oriented theory of instructional design sets out conditions by which a person can intentionally arrange for the learning of specific performance outcomes. Based on a taxonomy, or classification, of learning outcomes, Gagne's theory proposes internal and external conditions necessary for achieving these learning outcomes. It offers nine events of instruction which serve as a template for developing and delivering instructional units.

One of the major strengths of this model is that it values front-end analysis with emphasis on the learner. Gagne's (1987) model has been effectively used for the development of distance education courses and programs.

Learner-oriented instructional design. This category of conceptual models of instruction focuses on the learner. Instructional decisions are based on individual differences among learners (Richey, 1986). There are two main kinds of learner-focused models.

The first one is based on adult learning principles and includes Knowles' (1978) instructional model. The second stems from a body of research relating to interactions that occur between particular learner characteristics and the instructional approach. Snow's (1977) model falls into this latter category.

Knowles' (1978) theory of andragogy suggests the following about the design of learning for adults:

- Adults need to know why they need to learn something.
- Adults need to learn experientially.
- Adults approach learning as problem solving.
- Adults learn best when the topic is of immediate value.

Knowles further emphasizes several characteristics of the adult learner:

- As a learner becomes older, there is movement from dependency to self-directedness. Because of this, there can be resistance when adults are put into learning situations where they are not allowed to be self-directed.
- Because adult learners value personal experiences in learning, adult learning situations should de-emphasize traditional teaching techniques such as lecturing and include increased use of techniques that incorporate learners' experiences.

- Adults' readiness to learn is generally dependent on their needs and the developmental phases of the life roles they play. These roles include worker, spouse, parent, and other.
- Instruction for the adult learner should, whenever possible, focus on problems and applications that build on a content base. For instance, the adult learner requires opportunities to apply what he or she is learning in specific situations.

Given this characterization of the adult learner, it follows that adult learning is best achieved when there is mutual planning; diagnosis of learning needs; formulation of objectives that will satisfy these needs; identification of patterns of learning experiences; and evaluation of learning outcomes followed by additional diagnosis of learning needs (Knowles, 1978). Additionally, adult learners need to understand the significance behind what they are learning. Adult learning must further take into account the vast array of different experiences that every group of adult learners brings to the learning experience and enable individual learners to gather rather than simply receive information (Knowles, 1978, 1984).

While Knowles' important contribution to learning theory and design pertains to recognition of the uniqueness of the adult learning experience, Snow's (1977) lies in recognizing learning as a context-specific experience. Snow has suggested that data derived from continuous monitoring of individuals in a specific learning environment is integral to the construction and delivery of a successful learning experience. Interpretation of such data is called knowledge of individual cognitive processes (Richey, 1986).

Relevance to online nursing education. While learner-oriented perspectives (Knowles, 1978; Snow, 1977) are most certainly in line with the instructional experiences of web-based nursing education, components of the other model types are also relevant. For instance,

designing, developing, and implementing an effective online nursing education experience when there are large geographical distances involved requires a transparent framework with stages and steps: this way, the instructional designer, subject matter expert, instructor, and learner are as certain as they can be that the learner takes what is needed from the experience to meet his or her personal and professional learning goals and to practise safe patient care. Thus, online nursing education experiences must be carefully systematized: the multifaceted, integrated, and layered nature of nursing practice necessitates this kind of approach to instructional design. In nursing education, there is no room for uncertainty about achievement of learning outcomes; thus, a rubric-oriented approach and/or a systems model is valuable in determining whether or not all requisite components of the learning experience have been planned for and delivered.

The time- and task-oriented models are equally important in the online nursing education context. For instance, Huit's (1995) idea of output as specific measurement or measurements of learning is appropriate given the goals and objectives of nursing education. In order to be sure that nursing education is in the best interests of the nurse-learner and his or her patients, achievement of specific educational outputs is essential. Additionally, Bruner's (1966) and Gagne's (1987) task-oriented frameworks are valuable when reflecting on specific areas of nursing education that necessarily include performance-based outcomes. As noted, one of the major strengths of Gagne's model is its front-end analysis stage with focused awareness of the learner. Gagne's model, therefore, has been effectively used for developing distance education courses and programs. In nursing education situations involving working registered nurse-learners and distance, the importance of this kind of model is clear.

Reflecting on each of these design theories, online nursing education—by nature of the curriculum it conveys—must utilize components from each of the major approaches to instructional design, all the while respecting the characteristics of adult learners and their diverse

learning styles and preferences. When this happens and there is a skilled learning facilitator, the impact of the learning experience on the adult learner can be positive and productive.

Instructional design solutions to pedagogical issues in online nursing education. As already discussed, crucial to the design and delivery of all Internet-based learning environments is instructional design, a process used to plan, develop, and evaluate instruction so that it is efficient and effective as well as congruent with the learning theory that acts as scaffolding for the educational exchange. Like the learning it enables, instructional design is not an event but a process which includes "analysis, design, development, implementation, and evaluation" (Carter, Wiebe & Boissonneault, 2002).

Brought to online nursing education, instructional design excellence can facilitate exciting and rewarding pedagogical experiences. For example, nursing education supported by appropriate instructional design decisions can include meaningful and effective interactivity options; students can interact with their content, one another, the instructor, and unique learning objects. Personal learning activities and opportunities for group sharing can be facilitated through synchronous and asynchronous applications. Online modules including short, self-contained learning exercises can be taken on a mix-and-match basis according to interests, needs, and time constraints. In summary, an online nursing student who is comfortable with an Internet-based learning environment may experience as much interaction as in a face-to-face classroom. He or she will not, however, have to contend with the disadvantages of travelling in inclement weather and studying according to prescriptive schedules. Such interaction—when it occurs in some quantity and is a quality experience—is indicative of constructivist learning where the individual learner builds an understanding of content through many avenues and encounters. experienced over time.

Another area where instructional design process can play a positive role in web-based nursing education is in identifying and facilitating opportunities for reflection (Johns, 1995, 1996) and mentoring (Meleis, 2002). Reflection and mentored experiences are important components of all courses and programs for registered nurses (E. Rukholm, personal communication, March 10, 2004).

Today's new web technologies provide countless opportunities to support reflective learning, also an identified component of constructive learning. Generally, this entails a student-centered approach where the teacher assumes the role of the facilitator while students complete reflection-based learning activities (Maor, 2003). Although there are valuable social and support benefits in a networked community of learners (Vygotsky, 1978), in order to ensure that these relationships facilitate learning around targeted curriculum, extra planning and assumption of different roles by the teacher including "pedagogical, social, managerial and technical actions" are generally required. These actions are best accomplished when the instructor is supported by an instructional designer or is personally skilled in instructional design for the web environment (Maor, 129). Even what may appear to be the simplest of online reflective activities—for instance, threaded computer conferencing—is likely to require considerable design effort and time. The first tasks of developing a strong conference or bulletin board are selecting topics for discussion, implementing a cohesive strategy, and establishing participation expectations. The instructor must also assume the role of facilitating discourse. Finally, the instructor may need to present content, diagnose misunderstandings, and conduct assessment. Attending to each of these responsibilities is complex and time-consuming. Yet, each is necessary if the student's learning experience is to be rich and rewarding (Rourke & Anderson, 2002).

Historically, the mentoring relationship model was conceptualized as a personal relationship between an expert and a student or a less experienced colleague. Often occurring

outside the work setting and involving few or no formal reporting structures, the mentor-mentee relationship has been reported to enable improved clinical practice, career progression, scholarly and research-based undertakings, and personal achievements (Mills & Francis, 2005). While the mentorship model was initially rooted in one-to-one-relationships, it has recently undergone an evolution and now includes activities such as team mentoring, peer mentoring, and a practice called mentoring forward (Byrne & Keefe, 2002). Interestingly, this evolution has coincided with the emergence of a plethora of electronic strategies designed to facilitate interactions for long-distance relationships (Byrne & Keefe). Called telementoring or e-mentoring, this practice is now being used by nurses in educational and professional practice settings. As an example, the Registered Nurses Association of Ontario (RNAO) Centre for Professional Nursing Excellence, in partnership with the Ontario Telemedicine Network (OTN), recently developed a Telementoring Resource Kit (TMentRKit) as an outcome of the Ministry of Health and Long-Term Care funded Teleprimary Care Demonstration Project.

While the potential of e-mentoring is impressive, the process of e-mentoring often requires the planning and support of instructional design. With effective instructional design, today's registered nurse-learner studying in a web-based setting can experience mentoring through online asynchronous discussion forums, online synchronous chatting and text messaging, discussions enabled through web cameras, private e-mail, interactive CD-ROMS, desktop sharing applications, and desktop videoconferencing (live and archived).

Technical Issues in Online Nursing Education

It has been well documented that the technical aspects of web-based learning can be the source of many problems and frustrations for nursing educators and their students (Billings, Connors & Skiba, 2001; Cragg, 1994a, 1994b; Ryan, Hodson-Carlton & Ali, 1999). At the same time, it has been suggested that learning to use technology and overcoming technical problems

increase a student's proficiency with computers, a skill documented as a positive outcome by both students and faculty (Cragg; Conry, 1998).

In an early study of graduate-level nursing students' perceptions of traditional classroom teaching methods versus course delivery via the Internet, Ryan, Hodson-Carlton, and Ali (1999) found that web-based learning technologies perform several functions: first, they deliver course content. Furthermore, they provide the added benefits of a student learning how to combine nursing information with computer technology and improvement of technical and writing skills (Billings & Bachmeier, 1994; Schlosser & Anderson, 1994). Another benefit of computer-based learning may be an enhanced sense of self in the clinical setting. Madorin and Iwasiw (1999) examined the effect of computer-assisted instruction (CAI) on baccalaureate nursing students' sense of self-efficacy in caring for surgical patients in the clinical environment. They found that students who had participated in computer-assisted instruction (CAI) (n=11) had higher self-efficacy scores than those who did not (n=12). Madorin and Iwasiw (1999) also claim that the knowledge acquisition, retention, and decision-making skills of students using computer-assisted instruction (CAI) are equal to those of students who experience more traditional teaching and learning strategies including lecture, role playing, and printed instruction (Cohen & Dacanay, 1994; Day & Payne, 1987; Droste-Bielak, 1986; Gaston, 1988; Hamby, 1986; Neil, 1985).

Because the benefits of Internet-based instruction are generally perceived to outweigh its technical problems, those involved in distance education for nurses have moved quickly to incorporate web-based strategies into their courses and modules of study. There are no signs that this will lessen in the foreseeable future.

Human Supports in Online Nursing Education

Although distance education in its contemporary configuration (Bates, 1995, 2000) shows enormous potential for supporting superior learning opportunities for nurses, the practical

experience of the nurse-learner can be quite different from the theory. For instance, appropriate technology application continues to be a major issue in contemporary distance education. The fact that a technology exists does not in any way suggest its suitability for education. Some experts in the technology field such as Stoll (2002) argue that technology and education are not an appropriate mix at all. In Stoll's opinion, parents and educators need to think carefully about the beneficiaries of "wired" educational experiences and whether or not computers enhance learning in contrast with simple information gathering.

In addition to the general pedagogical and technical complications that technology-assisted education raises, issues exist around the readiness of the learner to manage technology. This latter problem applies especially to adult learners and, according to some experts, to women in particular. Burge (2000) says that many female learners "don't have the time or the inclination to spend time trying to conquer the finer points of a software program" (p. 34). Similarly, awareness that women's learning needs are different from those of men and that the female need for connectedness in contrast with special technical effects indicates a gender-based "difference in learning style not [a] deficit in cognition" is important (Burge, 2000, p. 30). A skilled instructional designer will acknowledge these factors and make design choices that respect the student as a working professional who may also be a wife, mother and community member with limited interest or skill in educational technologies.

While Internet courses can now support multimedia applications that do not require extensive bandwidth through technologies such as caching servers and can deliver learning experiences that are oral and synchronous in nature in contrast with experiences that are asynchronous and text-based, it is anticipated that, for some time, many college and university online courses will be mainly text-based. In part, this is due to the time and financial investments that colleges and universities made in the early days of online education when the web became a

repository for information and language-based learning activities. Thus, until there is sufficient organizational will to offer learners web-based education that is rich in multimedia, web-based education is likely, in many instances, to be reading and writing intensive.

Courses that are word-based make demands on learners' keyboarding, reading, and writing abilities. At the same time, in the domain of the post-RN nurse, web-based courses that are principally asynchronous and word based offer access and flexibility that other kinds of web-based courses might not. For example, live web casting and synchronous desktop sharing sessions would require the post-RN nurse to be present at particular times to take in lessons or tutorials. Because of the complexity of this nurse's personal and professional schedule, this could be logistically difficult to do. On a different but related note, if a nurse is trying to complete course work from the workplace, many computers in hospitals and healthcare settings do not include sound cards. The project team for a recent stroke education and research project offered by the West Greater Toronto Area (GTA) Stroke Network to nurses working in northeastern and northwestern Ontario discovered that nurses wanting to access live and archived web casts generally had to make special technical arrangements due to firewall restrictions in hospitals (M.Wheelwright, private communication, April 10, 2006). For these reasons, Ontario's distance-based nurse practitioner program—a program that began in 1995 involving ten schools of nursing from ten Ontario universities and that has experienced several iterations and utilized various technologies—remains, in general, an asynchronous reading- and writing-based program (Andrusynzyn, Cragg & Humbert, 2001; Humbert & Doucette, 2006).

The consequence of all these factors is that many post-RN nurse-learners will likely require support at several levels above and beyond the general support extended by family and work colleagues. The first of these supports relates to technical assistance. If a learner is burdened with repeated technical difficulties, learning about nursing may be low and frustration

with the web experience high. A second crucial member of the support team is the learning facilitator. Nursing educators must be knowledgeable not only in their subjects but also in nurturing relationships and mentoring in a technologically-mediated world. They must be willing to be "present" in their students' online world on a regular basis and in ways that distance facilitators in the past were not required to be. Today's distance instructors must be on line regularly so that ideas are challenged, reconfigured, and tried again. Such strategies necessarily demand a rethinking of pedagogical principles and practices. Faculty, therefore, often require training in the pedagogical possibilities and applications of educational software programs.

Other areas where support may be required for the registered nurse-learner include academic writing and independent learning strategies. University-level writing can be a new experience for many registered nurses; hence, writing samples and resources that diffuse anxiety around the writing experience and encourage development of nursing-specific writing skills are recommended. As the majority of registered nurses will have not completed university-level studies before starting their baccalaureate studies, they will also require support in information gathering and electronic library skills.

Another Position on Technology-enabled Education

Although there are many supporters of computer-assisted learning, there are important criticisms of it that merit acknowledgement. These concerns cluster into two main categories: return on investment and the learning experience itself.

In the literature, there is a voice that suggests that not all teachers and educational administrators are convinced that the financial and training investments that this kind of teaching and learning requires—including the purchase of equipment and software as well as the training of faculty and sometimes students—is worth it. Peslak (2005) describes how, in many cases, the investment in instructional technologies is high whereas the evidence of productivity in the form

of "better educated students" is scarce (p. 112). Similar sentiments have been expressed by Jochems (2003), Krueger (2000), and Papanastasion (2003). For instance, Papanastasion reports how computers are neither positive nor negative influences on student achievement in science. Rather, the critical factor is how computers are used which depends directly on what the involved institution is prepared to invest in faculty training. On a related note, Jochems argues that today's teachers are oftentimes required to be web designers if they hope to navigate the world of online learning successfully and that this puts investment pressure on all stakeholders. Krueger describes the negative effects of hypermodern technology on productivity and program development. Krueger, like Peslak, suggests that there is little evidence that more or better educational outcomes are being achieved through technology. Finally, Rodrigo (2003) suggests that access to technology is often a problem and that this undermines the view held by many educators that computer-based learning and other interactive communication technologies are "catalysts for transformation" (p. 100). For some, this lack of access with its roots in socioeconomics is indicative of an ever-growing digital divide (Attewell, 2001).

Of concern for others is the learning experience itself. In the opinion of McLester (2005), computers tend to be found in poor city inner schools; by contrast, the best jobs and places in college classes go to students who have been fully teacher taught. Specific to online education is the observation that many students do not know how to approach online resources in a blended learning experience so as to maximize the experience. As a result, the authenticity and active learning components of online case-based learning may be diminished (Ellis, 2005). Another reservation expressed about online learning is that it may erode the learner's ability to experience narrative (Gordon, 2005; Johnstone, 1991). Other dissenters suggest that Internet-based education fosters student isolation and that, while it may support the development of intellectual skills, it hampers interpersonal skills (Dede, 1991).

Critical Thinking in the Postsecondary Educational Context: Skills, Dispositions, and Measurement

During the last century, critical thinking became an area of special educational interest, tracing directly to the work of philosopher John Dewey who wrote on the centrality of critical thinking in the educational experience (Dewey, 1933). Going back further, critical thinking can be traced to the Greek philosophers including Socrates, Plato, and Aristotle. Socrates, for instance, embraced the questioning critical attitude (Furedy & Furedy, 1985); Plato maintained that education should encourage students to question, examine, and reflect on ideas and values (Aune, 1967); and Aristotle pointed out the relationship between thinking and the intellect (Oswold, 1962).

Much more recently, in the mid- to late-twentieth century, the concept and practices of critical thinking emerged in the work of, among others, Kitchener and King (1990), Paul (1993), Perry (1970), and Sternberg (1985). Because of a distinct surge of interest in critical thinking in the 1980s, that decade saw gravitation toward the idea that, at the heart of education, lie the processes of inquiry, learning, and thinking rather than mere accumulation of skills and information. By the decade's end, at least in the Western educational world, the movement to infuse both public school and postsecondary school curricula with critical thinking (CT) content and activities had gained remarkable momentum.

Just as the interest in critical thinking grew rapidly in the latter part of the twentieth century, so too did the confusion regarding what critical thinking means. Key points related to some dominant understandings of critical thinking of contemporary time are identified in Table 1. While all of the different understandings of critical thinking are important in contemporary times, most relevant to this study are the understandings offered by the American Philosophical.

Table 1

Understandings of Critical Thinking in the Late 20th Century

Understanding	Source
deciding what to believe or do based on reasonable, reflective thinking	Ennis, Millman & Tomiko, 1985
critical thinking...being appropriately moved by reasons and...to generate and seek out good reasons	Siegel, 1988
to think critically is to examine assumptions, beliefs, propositions and the meanings and uses of words, statements, and arguments	Bandman & Bandman, 1988
reflective thinking	Brookfield, 1987; Mezirow, 1981, 1990; Watson & Glasner, 1980
a productive and positive intellectual activity...a process...varies according to context	Brookfield, 1987
a process of purposeful, self regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological contextual considerations upon which that judgment is based	American Philosophical Association (APA), 1990

Note: From "Teaching and measuring critical thinking," by S. Staib, 2003, *Journal of Nursing Education, 42*(11), p. 502.

Regarding the former view of critical thinking, in 1987 through a Delphi project involving a group of American and Canadian scholars, the American Philosophical Association (APA) brought together 36 cross-disciplinary theoreticians from throughout North America to develop a conceptual definition of the ideal critical thinker. Based on the project's results, the ideal critical thinker is inquisitive; informed; trustful of reason; open-minded; flexible, fair-minded in evaluation; honest in facing personal biases; prudent in making judgments; willing to reconsider; clear about issues; orderly in complex matters; diligent in seeking relevant information; reasonable in the selection of criteria; focused in inquiry; and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit (Facione, Facione & Giancarlo, 2000).

By comparison, those who maintain that critical thinking involves reflection suggest that the critical thinker is one who possesses the ability to handle change; to rethink habits; to participate in self-examination of behaviours and ways of thinking; to create alternatives; to think things through; to do strategic planning and goal setting; to demonstrate specific intellectual and personal traits; and to reflect on the consequences of decisions (Brookfield, 1987; Merriam & Caffarella, 1999; Paul, 1993).

As a nonlinear, recursive cognitive process involving interpretation, inference, explanation, evaluation, and self-regulation (APA, 1990), critical thinking frequently occurs in a unique contextual situation. An important means, therefore, of measuring a person's skill as a critical thinker is the context-based test (Norris & Ennis, 1989; Pascarella & Terenzini, 1991; Pendarvis, 1996). Unfortunately, a major confounding variable with this kind of test is that the testee's score is likely to be affected by prior knowledge of the discipline or a specific application. Validation of the testee's critical thinking skills can be problematic: for instance, in the case of nursing, a context-specific measure of a nurse's critical thinking skills could only be

validated by direct observation of the nurse in practice. Thus, while context-based tests of critical thinking exist, they are generally expensive to develop and problematic to validate.

At the same time, there are a variety of standardized instruments available on the market dedicated to the measurement of critical thinking in a more generalized way. Some of the more popular of these tests with relevant commentary as they pertain to assessment for critical thinking in nursing are noted in Table 2. While the tests noted in Table 2 depend largely on multiple-choice test items, many critical thinking experts argue that multiple-choice items are not always the most appropriate way to measure critical thinking skills. Some qualitative means of assessing critical thinking include asking a learner to analyze a situation (Oermann, Truesdell & Ziolkowski, 2000); evaluating student-prepared portfolios, reflective journals (Ibarreta & McLeod, 2004); evaluating learning exercises based on narrative pedagogies (Ironside, 2003); and so forth. While all of these qualitative techniques have a place in nursing education, reflective journals and learning activities built on narrative pedagogies are especially relevant to this study.

Repeatedly, the nursing education literature describes the use of reflective journals and narrative pedagogy as ways of developing personal and professional confidence and awareness as a clinician. This should not be surprising given the prominence that reflective practice holds in the field in general (Daroszewski, Kinser & Lloyd, 2004; Kennison & Misselwitz, 2002; Kessler & Lund, 2004).

Journaling by nurse-learners can take several forms: for instance, it can involve an intimate relationship with an expert nurse such as occurs when journal entries are submitted for instructor feedback. It can also involve a collaborative relationship with peers: for instance, one student shares a significant experience with classmates who then assist the presenting student in making connections and identifying salient points. In both cases, reflective writing offers nurses

Table 2

Popular Standardized Tests Used to Measure Critical Thinking

Test	Comment
Watson-Glaser Critical Thinking Appraisal (WGCTA)	one of the most widely used standardized tests; an 80-item, self-administered test; for pre and postadministration; includes problems and arguments similar to those found in nursing situations; possible test bias; lack of cross-validation studies
California Critical Thinking Skills Test (CCTST)	frequently used by schools of nursing although does not contain discipline-specific content; assesses, via 34 multiple-choice items, the skills of analysis, inference, and evaluation; is an outcome of the 1987 Delphi project; some indications of cultural bias
Ennis-Weir Critical Thinking Essay Test	uses written essays to evaluate argument; generally not used in nursing or nursing education situations

Test	Comment
Collegiate Assessment of Academic Proficiency (CAAP)	Focuses on five areas: reading, writing, mathematics, science reasoning, and critical thinking; uses multiple-choice questions that respond to short essays; limited to ability to analyse, clarify, evaluate, and extend argument
Minnesota Test of Critical Thinking	builds on the APA definition and measures critical thinking skills and dispositions; has been suggested that it will benefit from further testing and revision
National League for Nursing (NLN) Critical Thinking in Clinical Nursing Practice	Recently developed as a response to the claim that existing tools are not specific to the context of nursing; are plans to use this test in conjunction with other tests to measure the critical thinking of graduating students
Indirect Measures of Critical Thinking	evaluates nursing knowledge, comprehension, application, and analysis

Note: From "Teaching and measuring critical thinking," by S. Staib, 2003, *Journal of Nursing Education, 42*(11), pp. 504-506.

opportunity "to reflect on their practice, explore reactions, discover relationships, and connect meanings to past experiences" (Kennison & Misselwitz, 2002, p. 239). Burrows (1995) suggests that reflective writing provides students the occasion to describe significant events as they understood them, explore their affective responses to these experiences, and answer three questions: What have I learned from this experience?; How would I behave given a similar situation?; In what ways do nursing and related theories explain the situation? As a kind of dialogue, this experience, according to Burrows, can elicit candid self-evaluation in addition to strategies for self-correction and future action. Written reflective exercises with appropriate structuring and feedback have also been reported to enhance critical thinking skills (Brown & Sorrell, 1993; Ibarreta, 2004; Kennison & Misselwitz; Sedlak, 1997). According to Sedlak, "reflections prompted students to think critically about their experiences and facilitated self-directed learning as students developed skills as professionals" (p. 16). Both critical thinking and self-directed learning as identified by Sedlak (1997) are elements in the adult education literature.

Narrative pedagogies align closely with the technique of reflective writing. Ironside (2003) points out that it is vital to redirect nursing education units from the quest of finding effective strategies for teaching critical thinking to consideration of the underlying assumptions that inform and characterize teaching and learning strategies. This new focus will, in turn, influence students' thinking experiences. In order to make this shift, Ironside (2003) argues that teachers and students should be encouraged to engage in "converging conversations wherein many perspectives can be considered" (p. 510). Such convergence as it requires questioning, perspectival openness, uncertainty, and fallibility can be effectively facilitated in the online learning setting where the voices and narratives of learners and their mentors can come together through the written word.

In the context of the post-RN nurse, the opportunity to grow as a reflective clinician and a writer in nursing through web-based educational settings is important. As the literature suggests, there is a demonstrated connection between reflection and clinical decision making (Daroszewski, Kinser & Lloyd, 2004; Kennison & Misselwitz, 2002; Kessler & Lund, 2004) and between reflection and writing (Brown & Sorrell, 1993; Ibarreta, 2004; Kennison & Misselwitz; Sedlak, 1997). Additionally, although there may be a perception among non-nurses that nurses do not do a great deal of writing, this is untrue. Nursing involves the use of many kinds of written communication: reports, articles, policies, procedures, patient case notes, charts, and so forth. Thinking more broadly, nursing is a field that requires nurses to use their communication skills, written and oral, "to promote consistent quality care, maintain continuity of care, to demonstrate critical thinking that accompanies the use of nursing process, to establish accountability for care, and to develop nurse-patient and nurse-colleague relationships" (Poirrier, 2000, 3-4).

Baccalaureate-educated nurses have other reasons for pursuing excellence in written communication. According to the web site of the Canadian Nurses Association, today's nurse is required to provide evidence-based practice and integrate findings into practice as well as be a team player, "working with other health professionals including dieticians, midwives, occupational therapists, pharmacists, physicians, physiotherapists, and speech therapists" (2003). As a result of these requirements, superior written and oral communication skills are more important in nursing than ever before. Finally, because baccalaureate nurses may assume positions as administrators, managers, educators, and researchers and/or pursue graduate-level studies, competence in writing is essential (Spears, 1996).

Dispositions Towards Critical Thinking or Habits of Mind

The literature on critical thinking dispositions wears several guises: for example, some educators and researchers use the term "mindfulness" while others refer to a "critical spirit." Regardless of the vocabulary used, the literature tends to suggest agreement on the idea that critical thinking dispositions are innate traits, not to be confused with critical thinking skills. A second key point made in the literature is that, while there is disagreement on whether or not critical thinking dispositions should be taught, there is consensus that critical thinking dispositions can often be nurtured or cultivated. This claim, in turn, leads to the question of how such dispositions can be measured.

In addition to providing the basis for the development of the California Critical Thinking Skills Test (CCTST), the 1987 Delphi project led to the development of the California Critical Thinking Disposition Inventory (CCTDI), a test that measures seven discrete critical thinking dispositions. According to Facione, Facione and Giancarlo (1998), a disposition towards critical thinking is a dimension of personality or characteristic that indicates the likelihood that a person will approach problem framing and solving using reasoning. Thus, a person's overall disposition towards critical thinking is a person's consistent internal motivation to embrace problems and make decisions by using thinking (Facione et al.).

The reasons for measuring a person's dispositions towards critical thinking are several: first, a relationship between critical thinking disposition and critical thinking skill has been demonstrated (McCarthy, Schuster, Zehr & McDougal, 1999). In practical terms, this means that, if an instructor and his or her student know something about the student's innate dispositions towards critical thinking, then the challenges of the instructional situation may be better managed than they might otherwise be. Knowledge about dispositions towards critical thinking, therefore, may increase the chance of an effective educational exchange.

A second reason for measuring the learner's dispositions towards critical thinking is that there is evidence to support the claim that, if a person is disposed to a particular critical thinking element, he or she will be motivated to cultivate this element (Bartlett & Cox, 2000; Facione et al., 1998). As already suggested, the position that critical thinking dispositions are innate does not mean that they cannot be enhanced or nurtured. To the contrary, knowing about natural strengths and weaknesses may stimulate a person to take proactive measures to develop the former and compensate for the latter.

Finally, it has been suggested that, without positive critical thinking dispositions, critical thinking applications may be substandard (Profetto-McGrath, 2003a). Hence, in the educational setting, it is important to gather information about learners' critical thinking dispositions so that learners and their teachers can take steps to enhance the learning experience based on that knowledge. From the instructor's perspective, this awareness may assist him or her in determining appropriate educational interventions.

As already noted, the California Critical Thinking Disposition Inventory (CCTDI) was an outcome of the 1987 Delphi project. Its focus is measurement of a person's innate dispositions towards critical thinking applications. Specifically, the CCTDI includes 75 Likert scale items designed to reflect seven discrete critical thinking dispositions: these dispositions are truthseeking, openmindedness, analyticity, systematicity, critical thinking confidence, inquisitiveness, and maturity (Table 3).

As a response to the 1987 Delphi study, Scheffer and Rubenfeld (2000) replicated the original APA study attempting to find consensus about the meaning of critical thinking for nursing. Their work led to the following description of the ideal nurse-critical thinker:

Critical thinkers in nursing exhibit these habits of mind: confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition,

Table 3

Seven Subscales of the California Critical Thinking Dispositions Inventory

Disposition	Description
Truthseeking	Measures intellectual honesty, the courageous desire for best knowledge in any situation, the inclination to ask challenging questions and to follow the reasons and evidence wherever they lead.
Openmindedness	Measures tolerance for new ideas and divergent views.
Analyticity	Measures alertness to potential difficulties and being alert to the need to intervene by the use of reason and evidence to solve problems.
Systematicity	Measures the inclination to be organized, including focus, diligence and perseverance.
Critical thinking confidence	Measures trust in one's own reasoning and ability to guide others to make rational decisions.
Inquisitiveness	Measures intellectual curiosity and intention to learn things even if their immediate application is not apparent.
Maturity	Measures judiciousness which inclines one to see the complexity in problems and to desire prudent decision-making, even in uncertain conditions.

Note: From *California Critical Thinking Disposition Inventory* (pp. 2-3), by P.A. Facione, N.C. Facione, and C. Giancarlo, 2001, Millbrae, CA: California Academic Press.

openmindedness, perseverance, and reflection (Scheffer & Rubenfeld, 2000, p. 7).

A key difference between the original APA definition and its focus on seven dispositions and the Scheffer and Rubenfeld (2000) definition is that the latter identifies ten different habits of mind rather than seven. This difference noted, there is solid correspondence between the Facione et al. (1998) list and seven of the ten attributes on the Scheffer and Rubenfeld list. Two of the three additional attributes—creativity and intuition—fall into the affective domain, an area not specifically referred to by the APA definition. The last habit of mind is reflection. While the researcher does not dispute that an effective nurse is likely to be intuitive and creative in her work, it is suggested that these characteristics which are challenging to measure in any context are very difficult to assess in nursing. Thus, while the Scheffer and Rubenfeld study is an important one, it has its limitations, and, to date, no tool has been developed to test the ten habits of mind identified in it.

A second noteworthy point regarding the two studies is that, in Scheffer and Rubenfeld (2000), reflection is cited as a discrete habit of mind indicative of critical thinking in nursing. There is no question that being reflective is a highly desirable characteristic in a nurse; at the same time, within the critical thinking literature, reflection is frequently regarded to be a tool and/or supporting structure (Ford & Profetto-McGrath, 1994; Schon, 1983; Shor & Friere, 1987). According to Duchscher (2003), reflection is that which goes "beneath the superficial structure of the situation to reveal the underlying assumption that constrains action" (p. 24) while, according to Johns (1995, 1996), structured or guided reflection is a tool that can enable critical thinking.

It is acknowledged then that the CCTDI does not investigate creativity, intuition, and reflection in particular ways. Regardless, the CCTDI was selected as an appropriate tool for this research project. Most importantly, this is because, as previously noted, there is no tool like the

CCTDI to measure Scheffer and Rubenfeld's (2000) ten habits of mind. Additionally, the researcher chose to use the CCTDI in combination with other data collecting strategies in order to compensate for any shortcomings it might have. Scoring and analysis of writing samples is one such strategy and has precedent in the nursing education literature (Andrusyszyn & Davie, 1997).

Another reason for using the CCTDI for this project is that it focuses on dispositions that are highly valued in a wide variety of leadership positions and occupational fields. For example, some nurses returning to study at the baccalaureate level may choose to continue their studies at the graduate level; graduate programs in nursing and the health sciences are springing up quickly at Ontario universities. The critical thinking dispositions articulated by Facione et al. (1998) will clearly be an advantage to these nurses and others who work in administrative and leadership roles. Finally, by using a tool that assesses critical thinking from a more general perspective in contrast with a tool based on the Scheffer and Rubenfeld (2000) definition, there are potential benefits for all universities that support online learning. For instance, the lessons learned from this project may have some applicability to other disciplines and professional schools within the university community at large.

While some nursing educators and researchers may have reservations about the CCTDI because it does not measure all the personal characteristics for nursing-specific critical thinking identified by some nursing theorists (Stone et al., 2001), there is much support for using the CCTDI in health education contexts. For example, the CCTDI is presently being used throughout the health education fields. In Canada, for instance, Profetto-McGrath (1998) used both the CCTST and the CCTDI with a group of baccalaureate nurses as part of her doctoral study with the University of Alberta. She reported that participants scored highest on the critical thinking disposition of inquisitiveness and lowest on truthseeking. This finding is important as it suggests

how baccalaureate nurse-learners may or may not critique the information they receive for its relative truth.

The CCTDI is also being used by the health sciences faculties at the University of Western Ontario and McMaster University. Based on their work with physiotherapy students, Bartlett and Cox (2000, 2002) from the University of Western Ontario reported that physiotherapy students scored highest on openmindedness and inquisitiveness, and lowest on truthseeking and critical thinking self-confidence. Based on these findings, the researchers suggested that the curriculum of the university's physiotherapy program appears to focus on the enhancement of certain dispositions, perhaps to the detriment of others. This point was further made in a telephone conversation that this researcher had with Dr. Bartlett in July, 2004. During this conversation, Dr. Bartlett revealed that the physiotherapy program at the University of Western Ontario continues to use the CCTDI, and that she believes that it is a very useful tool, particularly for what it suggests about learners and truthseeking. The reason that truthseeking is so important to educators and researchers in the health sciences, Dr. Bartlett indicated, is that truthseeking is the basis of evidence-based practice. Other benefits of using the CCTDI with learners studying in the health sciences include its possible role in career counselling, curriculum reform, and interdisciplinary education (Bartlett & Cox, 2000, 2002). Additional work in the health sciences where there is use of the CCTDI is described in Table 4.

Because of the complexity of the previous discussion, it is timely to step back and re-visit the general purpose of this research project, clarify certain relationships, and declare its theoretical framework As an overarching goal, the researcher is interested in understanding possible connections among critical thinking dispositions and skills; writing; and the online educational setting. The strategies proposed to explore these areas of interest and possible meanings are presented in Table 5. In addition, since there are differences between the

Table 4

Studies and Articles About the Use of the CCTDI in the Health Sciences

Author/Researcher/Title	Observation
Facione, N.C., & Facione P.A. (1997). *Critical thinking assessment in nursing education programs: An aggregate data analysis*. Millbrae, CA: California Academic Press.	Examined CT dispositions among 145 predominantly undergraduate samples at 50 programs of nursing education programs throughout the United States (n=7, 926). Significant relationships revealed between two measures of critical thinking (the CCTST and the CCTDI) and a wide variety of academic achievement indicators. Modest cross-sectional increases and longitudinal gains demonstrated in critical thinking skills and habits of mind. Strength in scores tended to occur in programs where nursing faculty reported being engaged in discussions about critical thinking. Disposition scores were higher for BScN stream students than for generic (college level) students. This discrepancy raised concerns about curriculum for students studying in generic programs. This study is the largest aggregation of CT skills and dispositions test data to date.

Author/Researcher/Title	Observation
Colucciello, M.L. (1999). Relationships between critical thinking dispositions and learning styles. *Journal of Professional Nursing, 15*, 294-301.	Examined relationship between CT dispositions and learning styles of baccalaureate nursing students. Used the CTTDI and Kolb's Learning Style Inventory. Relationships were demonstrated between specific CT dispositions and learning modes.
Leaver-Dunn, D., Harrelson, G.L., & Malissa, M., & Wyatt, T. (2002). Critical thinking predisposition among undergraduate athletic training students. *Journal of Athletic Training, 37*(4), 47-151.	Used the CCTDI to assess 91 students in undergraduate athletic training education programs for tendency to think critically. Participants showed a general but weak trend towards CT. The study suggests that classroom and clinical instructors need to assess and possibly change teaching methods to better facilitate CT by students.
Profetto-McGrath, J., Hesketch, K.L., Lang, S., & Estabrooks, C.A. (2003). A study of critical thinking and research utilization among nurses. *Western Journal of Nursing Research, 25*(3), 322-227.	Investigated relationship between CT disposition scores and research utilization habits. Results found positive correlation between CT disposition score and overall research utilization.

Author/Researcher/Title	Observation
Rapps, J., Riegel, B., & Glasser, D. (2001). Testing a predictive model of what makes a critical thinker. *Western Journal of Nursing Research, 23*(6), 610-626.	Examined if knowledge base, CT skills, CT dispositions, and experience predict the cognitive development of nurses. The three levels of cognitive development studied were dualism, relativism, and commitment. CT dispositions contributed to all three levels of cognitive development.
Ip, W.Y., Lee D.T., Lee, I.F, Chau, J.P. Wootton, Y.S., Chang, A.M. (2000). Disposition towards critical thinking: A study of Chinese undergraduate nursing students. *Journal of Advanced Nursing, 32*, 84-90.	Examined dispositions among 122 Chinese baccalaureate nursing students. Showed a negative disposition among the majority of the sub-scales. Also revealed a significant relationship between CT dispositions and grade point average. Implications for nursing education, curriculum, and research delineated.

Table 5

General Progression of Research Project

Pre	Experience	Post	Data
1. CCTDI	Online, distance-based, university-level course with reflective writing	1. CCTDI	1. CCTDI scores
2. Demographic data and self-perceptions related to online learning		2. Participants' perceptions	2. Scores given to bulletin board postings; writing analyzed for strengths, weaknesses, and themes
		3. Interviews	3. Interview data
		4. Researcher's observations of bulletin board activity	4. Researcher's observations of bulletin board activity

dispositions of the APA definition which is used in this study and the ten habits of mind for nurses suggested by Scheffer and Rubenfeld (2000), a comparison of similarities and differences and an itemization of how each disposition will be examined in found in Table 6.

Finally, acknowledging theory as that which assists the researcher in deciding what he or she will observe and keeps the researcher on track, the reseacher has chosen constructivist learning as the theoretical architecture of the study. By comparison, the context of the study is an online learning setting where specialized content is involved. Considering the study at yet another level, it brings together a variety of elements indicative of constructive learning including reflection through writing (Brown & Sorrell, 1993; Ibarreta, 2004; Kennison & Misselwitz; Sedlak, 1997); andragogy (Knowles 1975, 1980), and critical thinking (Brookfield, 1987; Mezirow, 1981, 1990; Watson & Glasner, 1980; APA, 1990). In summary then, the study is—as a consideration of online learning as a subset of distance learning—knowledge-, community-, and learner-centered (Anderson, 2004). Possible meanings based on anticipated findings are found in Table 7.

More about the Context of Critical Thinking and Western-based Nursing

Situating the principles and practices of contemporary critical thinking within Western nursing education requires consideration of what has been described as a major paradigm shift. Watson (1999), in her seminal work on paradigms and worldviews in nursing, points out how nursing during the twentieth century was shaped largely by themes and concepts including objectivity, rationality, technology, and positivist reasoning. Because of these themes and concepts, nurses tended to be trained rather than educated; in addition, the profession of nursing was seen principally as a subset of medicine rather than as a discipline or profession in itself.

Table 6

Connections between Dispositions Towards Critical Thinking (CCTDI, 2001) and Habits of Mind (Scheffer and Rubenfeld, 2000) and Assessment Strategies

CCTDI (2001)	Scheffer and Rubenfeld (2000)	Assessment strategy
Truthseeking	Perseverance Flexibility	CCTDI Reflective writing
Openminded-ness	Openmindedness	CCTDI Reflective writing
Analyticity	Intellectual integrity	CCTDI Reflective writing
Systematicity	Intellectual integrity	CCTDI Reflective writing
Critical thinking confidence	Confidence	CCTDI Reflective writing
Maturity	Contextual perspective	CCTDI Reflective writing
Inquisitiveness N/A	Creativity Openmindedness	CCTDI Reflective writing

CCTDI (2001)	Scheffer and Rubenfeld (2000)	Assessment strategy
N/A	Intuition	Reflective writing
N/A	Reflection	For the purposes of this project, reflection is understood to be a foundation for and a tool of critical thinking. Additionally, reflective writing is understood to be a cognitive and affective (creative, intuitive) experience. It is an action in contrast with a disposition.

Table 7

Possible Meanings in the Event of Significant Change and No Significant Change

Significant change in one or more dispositions: Possibilities	No significant change: Possibilities
...online nursing courses that use reflective writing as a central communication and learning technique can facilitate positive changes in nurse-learners' dispositions towards critical thinking...	...the curriculum and/or instructional design of an online course do/does not influence the development of dispositions towards critical thinking...
...the sample group—because of its area of study—is more open to changes in dispositions towards critical thinking than other learners...	...changes in critical thinking dispositions take longer to occur than a four-month period...
...collaborative thinking and writing in the "semi-public" forum of an Internet-based course raise the "critical thinking bar"...	...more supports for and models of reflective writing and critical thinking through writing are required to support growth in critical thinking dispositions...

In contrast, when Watson (1999) speaks of contemporary or postmodern nursing, she sees it as embracing multiple truths, nonlinearity of thinking and acting, and a sense of human caring. Following from this idea that postmodern nursing has entered "an historical period of transitions" (Watson, 1999, p. 5), it is logical that contemporary nursing education is in a state of radical change. Muff (in Watson, 1999) emphasizes how, in the past, nursing education was physically removed from mainstream education by social institutional forces. This led to nursing education patterns with specific models, theories, and language that contributed to nurses' alienation from coworkers. As suggested earlier, contemporary nursing education for registered nurses in the province of Ontario, as well as most other provinces in Canada and states in the United States, involves a university degree, thereby placing nursing education within a setting that, by its nature, demands critical thinking of learners.

Central to understanding early twenty-first century nursing and nursing education in Canada and the United States is the definition and social policy statement about nursing first put forward by the American Nurses' Association in 1995. Attesting to the changing nature of nursing and its continuous experience of redefinition, the ANA definition, in an important postscript, sets out four features as essential components of contemporary nursing:

> Since 1980, nursing philosophy and practice have been influenced by a greater elaboration of the science of caring and its integration with the traditional knowledge base for diagnosis and treatment of human responses to health and illness. As such, definitions of nursing more frequently acknowledge four essential features of contemporary nursing practice:
>
> - attention to the full range of human experiences and responses to health and illness without restriction to a problem-focused orientation.
> - integration of objective data with knowledge gained to form an understanding

of the patient's or group's subjective experience.

- application of scientific knowledge to the processes of diagnosis and treatment.
- provision of a caring relationship that facilitates health and healing.

(American Nurses Association, 1995, as found in Watson, 1999)

Because of these changes within clinical nursing practice and nursing education and the very high pace of contemporary nursing practice due to cutbacks, shortages, and technology, it follows that nurses must possess dispositions that enable them to think critically and efficiently. Thus, in nursing today, critical thinking dispositions and skills are essential work strategies and transferable skills.

While the connection between the state of present-day nursing and the need for nurses to be competent critical thinkers is straightforward enough, the specific literature on critical thinking and nursing is, at best, complex. Table 8 points out some of the inconsistent and conflicting opinions about critical thinking and nursing found in the literature. Despite these varied understandings, nursing- and health education-oriented researchers have conducted a variety of studies that examine critical thinking and nursing. Table 9 presents the highlights of some of these studies.

Review of the information presented in Table 9 reveals that the majority of these studies have used qualitative methods. On one hand, this could suggest that, for many nursing educators and researchers, critical thinking is a largely qualitative occurrence. At the same time, it is suggested that the results of the qualitative methods described in Table 9 demand careful scrutiny because of the heavy reliance on self-judgment and self-report. Thus, a fair conclusion might be that assessment of critical thinking is a complex activity and should ideally include quantitative and qualitative methods.

Table 8

Some Definitions of Critical Thinking in Nursing

Definition	Source
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
a free, rational, and autonomous mind	Jones & Brown, 1991; Paul, 1993

Note: From "Critical thinking: perceptions of newly graduated female baccalaureate nurses," by J.E. Duchscher, 2003, *Journal of Nursing Education, 42*(1), pp. 15-25.

Table 9

Summary of Major Contemporary Studies of Critical Thinking and Nursing

Author and method	Goal	Evaluation and results
Baker, C.R. (1996). Reflective learning: A teaching strategy for critical thinking. *Journal of Nursing Education, 35*, 19-22.	To help students identify their own cognitive and affective behaviour during nursing practice.	_____
Bell, M.L., Heye, M.L., Campion, L., & Hendricks, P.B., (2002). Evaluation of a process-focused learning strategy to promote critical thinking. *Journal of Nursing Education, 41*, 175-177.	To teach students how to conduct in-depth analyses of clinical incidents that caused them to use critical thinking.	Anecdotal. Students appeared to strengthen theoretical and experiential knowledge.
Callister, L.C. (1996). Maternal interviews: A teaching strategy	To foster critical thinking in the cognitive and affective domains.	Anecdotal. Student and faculty reported an increase in critical thinking.

fostering critical thinking. *Journal of Nursing Education, 35*, 29-30.		
Daley, B.J., Shaw, C.R., Balistrieri, T., Glasenapp, K., & Piacentine, L. (1999). Using concept maps: A strategy to teach and evaluate critical thinking. *Journal of Nursing Education, 38*, 42-47.	To increase critical thinking by helping students identify and draw relationships between concepts.	Evaluated knowledge acquired during the semester. Statistical comparison of first concept map to third concept map. Statistically significant difference between the first and third maps was found. Students like the method but thought it was time consuming. Faculty thought the maps demonstrated students' knowledge.
Eerden, K.V. (2001). Using critical thinking vignettes to evaluate student learning. *Nursing and Health Care Perspectives, 22*, 231-234.	To teach critical thinking skills in a controlled laboratory environment that stimulates the complexity of clinical nursing situations.	Anecdotal. Favourable faculty response.

Jenkins, P., & Turick-Gibson, T. (1999). An exercise in critical thinking using role playing. *Nurse Educator, 24*(6), 11-14.	To increase students' awareness of the effects of disease on the life of someone living with the disease.	Anecdotal. Students' journals showed critical thinking through problem solving during their experiences.
Jones, D.C., & Sheridan, M.E. (1999). A case study approach: Developing critical thinking skills in novice pediatric nurses. *The Journal of Continuing Education in Nursing, 30,* 75-78.	To provide novice nurses with a chance to make decisions, apply knowledge, and examine beliefs in a safe setting.	Anecdotal.
Krejci, J.W. (1997). Imagery: Stimulating critical thinking by exploring mental models. *Journal of Nursing Education, 36,* 482-484.	To stimulate students to think about the images that appear in response to terms common to nursing.	Anecdotal. Positive feedback from students.

Mottola, C.A., & Murphy, P. (2001). Antidote dilemma-an activity to promote critical thinking. *The Journal of Continuing Education in Nursing, 32,* 161-164.	To teach students how to "practise thinking," then think about and evaluate the thinking process.	Critical thinking was measured using two parts of the NLN Psychiatric Nursing Examination. Knowledge was measured using two other parts of NLN Examination and the Mosby Assess Test. Authors believed that thinking about factors students had not considered in their solutions to the dilemma was valuable in teaching critical thinking.
Perciful, E.G., & Nester, P.A. (1996). The effect of an innovative clinical teaching method on nursing students' knowledge and critical thinking skills. *Journal of Nursing Education, 35,* 23-28.	To determine the effect on students' knowledge and critical thinking of CAI vs. clinical experience.	WGCTA scores. CAI students scored higher on the NLN Examination (i.e., critical thinking). No statistically significant difference in knowledge was found between the groups.

Rossignol, M. (1997). Relationship between selected discourse strategies and student critical thinking. *Journal of Nursing Education, 36,* 467-475.	To compare effectiveness of five strategies: teacher high-level questions, teacher elaboration of student ideas, teacher probing questions, student participation, and student-to-student participation.	Inconsistent, small positive relationship was found between high-level teaching questions and critical thinking. Large inverse relationship was found between student participation and critical thinking.
Russaw, E.H. (1997). The personally perceived problem technique: Enhancing clinical instruction. *Nurse Education, 22*(4), 36-43.	Students identify personal learning needs, work through these needs, and identify future improvements.	CCTST
Saucier, B.L., Stevens, K.R., & Williams, G.B. (2000). Critical thinking outcomes of computer-assisted	To compare the effect of CAI and written case study strategies on critical thinking abilities of nurse	Anecdotal. No significant increase in critical thinking occurred using either method.

instruction versus written nursing process. *Nursing and Health Care Perspectives, 21,* 240-246.	practitioner students.	
Schumacher, J., & Severson, A. (1996). Building bridges for future practice: An innovative approach to foster critical thinking. *Journal of Nursing Education, 35,* 31-33.	To facilitate continuing development of critical thinking by nurses and create a dialogue among various levels of nurses and students.	Nurses and students reported a "therapeutic" effect.
Sorrell, J.M., Brown, H.N., Silva, M.C., & Kohlenberg, E.M. (1997). Use of writing portfolios for interdisciplinary assessment of critical thinking outcomes of nursing students.	_____	Students completed a questionnaire at the end of the course.

Nursing Forum, 32(4), 12-24.		
Todd, N.A. (1998). Using e-mail in an undergraduate nursing course to increase critical thinking skills. *Computers in Nursing, 16*, 115-118.	To increase student participation in learning and student-teacher interaction.	Most students responded that they felt the exercises using e-mail were useful and improved their critical thinking. Recommended for future use.

Note: CAI = computer-assisted instruction; CCTST = California Critical Thinking Skills Test; NLN = National League for Nursing; WGCTA = Watson-Glaser Critical Thinking Appraisal.

The intent of this research study then is in line with the interests of other nursing researchers and educators as they seek to learn more about nurse-learners as critical thinkers. As previously noted, it would be a practical choice to use a quantitative tool based directly on the work of Scheffer and Rubenfeld (2000); however, presently, no such instrument exists. Hence, the decision was made to assess a group of nurse-learners by using the CCDTI as well as through other carefully chosen quantitative and qualitative methods.

Critical Thinking, Discipline-specific Writing, and Interaction

As discussed, critical thinking and nursing education have become an especially powerful combination during the last twenty years as nursing has moved from a medically-based to a more holistically-based model of practice and education (Johns, 1995). In practical terms, this shift has required nurses to think more critically about their nursing care plans, attitudes, and actions so that they are, to the best of their abilities, responding to the needs of the whole patient.

A further factor influencing schools of nursing education to make critical thinking through reflection an integral part of the curriculum is that competent nursing practice requires much more than content knowledge in clinical practice (Cody, 2002). According to Ironside (2003), such practice requires "ongoing and interactive understanding of both the context of care and patients' experiences of wellness and illness" (p. 510). Additionally, just as information is increasing at an alarmingly rapid rate, so too has the amount of content that needs to be covered by nursing curricula. The result of this is something called the "additive curriculum" (Ironside, 2004, p. 509)—an unwieldy experience for educators and students.

These factors and others have led schools of nursing throughout North America to dedicate time and resources to the development of learning opportunities and settings which—in addition to "covering content"—nurture students' growth as thinkers (Ironside, 2004). Accomplishment of this goal, according to Johns (1995), requires conscious and organized

reflection practised in nurses' formal courses. It is, according to Johns, shortsighted to think that nurses will be able to teach themselves these skills within the fast-paced context of contemporary health care. Powell (1989) similarly points out that nursing education experiences must enable nurses to be proficient thinkers, and that nurses cannot realistically be expected to learn new and complex ways of thinking on their own without formal instruction and opportunities to practise these ways of thinking in safe settings.

Two techniques documented in the literature to facilitate critical thinking and in keeping with Brookfield's (1987) androgogical principles based on the specific ways adults learn are interactive learning and reflection. Since as far back as Dewey (1916), interaction with other learners has been regarded to be a key element in the decisions that educators make about incorporating technology into an educational experience. Some educators argue that such interaction not only supports but actually defines the educational experience (Anderson, 2003).

In nursing education, interactive learning is an integral part of the learning experience and parallels the clinical setting where a team of health care professionals work together. Hence, the nursing education literature recommends instructional activities and experiences such as questioning, small group learning, role playing, debate, case studies, journals, simulations, problem solving, and writing assignments (Abegglen, 1997; Elliott, 1996; Whiteside, 1997). Of the approaches noted, the three most frequently recommended are small group activities, role playing, and journals (Simpson & Courtney, 2002).

In similar fashion, the nursing education literature is rich in recommendations about the use of reflective writing as means of enhancing critical thinking or "thinking aloud on paper" (Ibarreta & McLeod, 2004). At times, reflective writing can be an individual activity such as journal writing (Daroszewski et al., 2004; Duchscher, 2003). At other times, it can include activities such as sharing ideas and resources with others. Other forms of reflective written

activity include written assignments with instructor and peer feedback (Tsui, 1999) and group work in which learning teams follow a pattern such as "think/pair/share" (Lauder & James, 2001).

Integration of these kinds of activities into the nursing education setting represents an effort to insure that learners will experience what Schon (1983, 1987) called reflection-in-action and reflection-on-action. Sometimes referred to as "thinking on our feet," reflection-in-action is about looking at one's experiences, connecting with feelings, and examining theories in situations of practical application. The outcome of this reflection is often a new understanding that informs actions in the present. More specifically:

> the practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation. (Schon, 1983, p. 68)

By comparison, when the learner considers his or her actions after an event, Schon calls this reflection-on-action. It is through these two kinds of reflection that nurses and other professionals become stronger critical thinkers in their daily practices.

As discussed, Internet-based education offers several synchronous and asynchronous ways for the exchange of ideas and facilitation of interactive learning. In this study with its focus on writing in a shared public space where there is natural potential for interaction, it is important to note that the researcher is also interested in the potential of this setting for enabling students' growth as discipline-specific writers. By definition, an effective discipline-specific writer is a person who is able to express ideas effectively within a particular discourse community—in this

research project, the community of baccalaureate prepared nurses. Generally, discipline-specific writing involves patterns of thinking congruent with the area of study and demonstrated competence in using relevant literature and writing conventions. In nursing and health fields in general, writing conventions are set by the American Psychological Association (APA). When a person can write confidently and competently according to the standards of his or her discipline, this generally means that the person can demonstrate knowledge not only with words and the thinking patterns that characterize the community but also that he or she will be accepted into the discourse community.

The research into the benefits of "teaching" discipline-specific writing divides into three major perspectives. The first includes those who maintain that discipline-specific writing conventions should be taught (Elbow, 1991), while the second includes those who believe that students may be denied authentic voice if they are required to use writing conventions taught to them in formal and quasi-formal ways. Finally, there is a third group of writing theorists and instructors who maintain that competence as a discipline-specific writer occurs most efficiently when formal instruction, writing opportunities, and a supportive environment come together.

On the subject of how students learn to do discipline-specific writing best, Colomb (1988), like Elbow (1991), suggests that students need models and sample texts in addition to many and diverse occasions to practise their writing: they need, in other words, clear directions and assistance in their quest to become effective discipline-specific writers. Freedman (1993), however, suggests that explicit teaching of writing conventions is much less important than the instructor's role in "setting up facilitative environments" (p. 237). Freedman further states that students need considerable reading experience "in the discourse of the discipline, along with attention to their anxiety level, motivation, and intention" (p. 238). The third position on discipline-specific writing is held largely by those who work side by side with students in

classrooms and writing clinics in colleges and universities across North America. In these settings, the student is provided tools and explanations and then "the process of understanding" is turned over to the student (Harris, 1986, p. 121). In the context of discipline-specific writing, this means that the student is provided with the resources he or she will need to navigate the writing challenges of the subject; then, the student needs many opportunities to practise writing in the discipline and receive constructive feedback.

Whether one supports the idea of directed teaching or the facilitative writing environment approach or the blended perspective, the online learning milieu is emerging as a valuable setting for cultivating learners' growth as discipline-specific writers. Each theoretical position, with certain supports, can be actualized in an Internet-based learning environment. The online environment—through e-mail, asynchronous discussion boards, synchronous chat, and other writing-based tools—offers countless opportunities for instruction, feedback, support, and practice. Some of the ways by which discipline-specific writing can occur in an online nursing education setting are presented below:

- Weekly written submissions to the instructor's online dropbox: According to Bilinski (2002), this strategy, called "the mentored journal," can be highly effective in enhancing the process of critical thinking among nursing students.
- Directed asynchronous journaling using an online discussion board: Daroszewski et al. (2004) used this strategy with a group of advanced practice nurses and reported that all participants described this experience of shared journaling as "highly effective and valuable" (p. 178).
- Asynchronous discussion of a complex case study using an Internet classroom assistant (ICA) conferencing forum: Malloy and De Natale (2001) used this approach to bring together nursing students from two different universities. The

students reported that the experience increased their comfort with computer applications, and they expressed appreciation for exposure to a case they might not otherwise experience. Faculty identified cross-disciplinary sharing of ideas as a positive outcome of this kind of discussion forum.

- Web-based discussion groups within a large lecture setting: Participation and interaction were identified by Harden (2003) as the main benefits of online discussion groups used with a class of 117 nursing students.
- A blend of reflective journals submitted online to the instructor and online clinical case studies revealed in a progressive fashion: According to DeBourgh (2001), these strategies can enable nursing students to experience communication, collaboration, coaching, and "cognitive apprenticeship" within clinical nursing courses, thereby supporting the transition from student to novice nurse.

Reflection, Writing, and Critical Thinking in the Online Educational Setting

As previously suggested, the relationship between critical thinking and reflection is a unique one. While some educators and philosophers claim that reflection is a characteristic or trait of the critical thinker, the position adopted in this study is that the proficient critical thinker is skilled in the technique of reflection while reflection itself is a heuristic tool that fosters critical thinking (Kessler & Lund, 2004). Additionally, reflective learning is an experience that is 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, p. 22). Or, as Boud, Keogh, and Walker suggest (1985), reflective learning is a combination of intellectual and affective activities whereby individuals explore experiences to come to new understandings.

While reflective journal writing and other writing-based activities have long been valued by educators—Bilinski (2002) claims that the "writing to learn paradigm" with its emphasis on "personal transformation" is a valuable tool in fostering critical thought and concept clarification—the potential of the web in supporting reflection through writing has only recently emerged in the literature. Still, the early findings are impressive. In the case of nursing education, Kessler and Lund (2004) describe how online reflective journaling accomplished through e-mail and electronic drop boxes embedded in courses can enable 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 a nurse-learner to reflect on clinical practice experiences and develop new insights and understandings. Nursing students themselves report how online journaling facilitates self-directed learning and critical thinking (Ibarreta & McLeod, 2004).

While the earliest e-writing strategies tended to focus on writing submitted to a faculty member for feedback, there is growing interest in the community of thinking and writing that can occur within the context of a managed asynchronous bulletin or discussion board. Bilinski (2002) points out that writing, when it is shared, brings together experiences, feelings, implications, and connections. In former configurations of the distance education experience, these kinds of mentoring and feedback occurred solely via the relationship between an instructor and an individual student; the electronic bulletin board, by contrast, can support a different kind of mentoring, not the least important being mentoring by peers. When this occurs, "support, vision, and challenge" become possible (Bilinski). Different nurse-educators also report how online discussion groups can foster understanding of content and support active learning (Harden, 2003). Some of the benefits affiliated with online reflective writing are the following:

- encouragement of participants to see and understand others' points of view

- challenging of participants to include references to relevant literature as supports for positions and claims
- use of comments made by others to gauge personal thinking
- decreases in test anxiety and increases in general thoughtfulness
- multiple responses (Harden)

A further benefit of online reflective writing among nurse-learners is that it can be an exemplification of the collaboration that is the hallmark of successful practice in contemporary health care (DeBourgh, 2001). Finally, and important to this project, is the claim that the peer support, sharing, clarification of ideas, and opportunities to practise professional communication that electronic discussion boards can provide assists learners in performing better on critical thinking tests than other learners (DeBourgh).

Summary

This literature review has demonstrated the following:

- online distance education is a popular option among Ontario nurses seeking baccalaureate and continuing professional development opportunities
- the learning needs of registered nurses relate to issues of gender
- online education can facilitate reflection, interaction, and discipline-specific writing, all of which may contribute to the development of critical thinking
- online learning has been criticized for its costs and returns and the learning experience it offers students
- critical thinking has been an area of growing interest among North American educators since the 1980s; it is studied largely from two perspectives: dispositions and skills
- critical thinking is regarded as an important learning outcome of nursing curricula

across North America

- reflection is a tool that may foster critical thinking
- Internet-based nursing education may hold potential as an enhancer of learners' critical thinking dispositions and skills when reflective writing is a key component of the learning experience

Study Hypotheses

Based on this literature review, the hypotheses explored in this study are as follows:

1. online nursing courses that include asynchronous reflective writing activities enhance the learner's dispositions towards critical thinking,
2. online courses that include asynchronous reflective writing activities increase the learner's perception of competence as a writer, and
3. online courses that include asynchronous reflective writing activities facilitate demonstration of critical thinking skills through writing.

These hypotheses will be considered within the context of a constructivist learning setting. It is further anticipated that the study may make a contribution to the advancement of constructivist learning theory when learning settings include special components such as physical distance and/or older learners. Reflections offered by the post-RN students and their instructors during interviews, bulletin board contributions, and the researcher's observations will be considered for possible inference of such advancement.

Chapter III

Methods

Participants

The participants in the study included 34 post-RN nurse-participants, 28 undergraduate nursing students, and 22 undergraduate sociology students. The following paragraphs describe the participants and provide relevant contextual information about their respective learning settings and levels of participation.

The 34 participants in the experimental group were registered nurses enrolled in a baccalaureate-level online course as part of a post-RN degree program in its fifth offering at Laurentian University in Sudbury, ON. Laurentian University is a mid-sized university in northeastern Ontario with several health education programs including nursing, midwifery, social work, and medicine. Laurentian has a centralized unit for continuing and distance education called the Centre for Continuing Education.

The post-RN course targeted by the study is called Nursing Healthy Individuals and Families. In this combined theory and practice course, there is a focus on the nursing process, group dynamics, teaching and learning, critical thinking and reflective practice, family assessment, growth and development, and therapeutic communication. Students support their learning by practice-based work in the community.

Post-RN nurses can take Nursing Healthy Individuals and Families at different points in the program, and it is possible to have students who are early in the program taking the course with others who are finishing the program. In other words, nurses who have no university education and who trained to become nurses directly out of high school may be studying with nurses who are near completion of their degrees.

The programs offered by Laurentian University School of Nursing including the post-RN program are committed to "the scientific component of the practice of Nursing [that] involves abstract and logical thinking skills and the generation and utilization of research findings, knowledge and experience" (Laurentian University School of Nursing Student Manual, 2006). According to the Director of the School of Nursing at the time of this study, the School's nine articulated goals are "conceptual and broad-based in nature" and are "inclusive of critical thinking and reflection. We include these concepts within the delivery of all programs" (S. Mossey, personal communication, April 5, 2006).

The particular version of Nursing Healthy Individuals and Families examined in the study was the first offering of the Web Course Tools (WebCT) version of the course. Laurentian's Centre for Continuing Education, a teaching and learning unit with a strong history in distance and continuing education, provided instructional design expertise as well as administrative and technical support for students and instructors during the course. Content expertise and the faculty members who mentored the students in the course came from the School of Nursing.

Because of the enrolment in the course (n=130) at the time of the study, the course was offered as three sections, each section with its own instructor. All instructors are highly experienced female faculty members in their mid-careers. Two instructors are part-time instructors while the third is a full-time faculty member. This course was the first distance-based teaching experience of any kind for the full-time faculty member. Of the two part-time instructors, one had taught two print-based distance courses supported by teleconferences and one Internet-based course while the other had not taught any distance courses before.

As noted, of the 130 nurses enrolled in the course, 34 agreed to participate in the study. This low participation rate may be due to several factors including the complex and stressful lives of working nurses (McVicar, 2003; Stordeur, D'Hoore & Vandenberghe, 2001). This point

will be discussed in detail in Chapters V and VI. Most notable in the literature pertaining to the complexity of nurses' lives is the issue of workplace stress and constant change. As well, not unlike rural nursing research which has been described as a research field with challenges related to recruitment of research participants (Cudney, Craig, Nichols & Weinert, 2004), this research project involved a distance component that included northern and remote regions. The multifaceted design of the research study with before and after components, an intervention, and several data collecting strategies is another factor that may have affected participation. Additional factors suggested to have been influences are that some of the nurses were new to university and/or online learning and that the survey was delivered to the post-RN nurses as a web-based survey. While web-based surveys offer many advantages to researchers when face-to-face interaction with potential participants is not possible, the literature suggests that response rates to web-based surveys are not always as high as other kinds of surveys (Dillman, Tortora, & Bowker, 1998a, 1998b; Duffy, 2002; Sitzia & Wood, 1998). Although the benefits of web-based surveys for the researcher are self-evident, there are mixed findings about response rates.

In light of these considerations, while a higher participation rate was desired, the researcher was satisfied that the response rate was workable. This view was supported by Irmajean Bajnok, Director for the Centre of Professional Nursing Excellence through the Registered Nurses Association of Ontario (personal communication, April 21, 2006). Her observation was that the response rate for this study "is very respectable" particularly because it involved "a longer term commitment" (personal communication, April 21, 2006).

It was important for the researcher to maintain a focus on students from the same university given the diversity of educational philosophies and approaches that different universities hold regarding online courses. She, therefore, approached the Director of Nursing at Laurentian University to discuss appropriate comparison groups. During the term targeted by the

study, there were no other post-RN courses being offered on line. In turn, the researcher and the Director discussed other undergraduate courses wherein faculty would be amenable to participation of their students in a research study. After consideration of two possibilities based on the recommendation of the Director, the researcher decided to approach the instructors of a course called Nursing Research I. While the content of this course did not match that of Nursing Healthy Individuals and Families, the researcher determined that the juxtaposition of the two groups would yield valuable findings about the critical thinking experiences of different types of nurse-learners enrolled in the same school. Additionally, the researcher chose to regard the different groups involved in the study to be comparison groups rather than control groups.

As noted, the principal comparison group included Laurentian University undergraduate nursing students taking a term-length, university-level face-to-face (on-campus) course called Nursing Research I. This group, in contrast with the post-RN learners, did not experience the intervention of online delivery. Rather, the class met with their instructors—one male and one female—from the School of Nursing once a week for three hours. Additionally, while the content of this course was different from that taken by the post-RN group, it also emphasized critical thinking: the focus of the course is that students are challenged to transform personal inquisitiveness into posing, exploring, and answering researchable questions. Using both qualitative and quantitative research methods, students are required to examine the research process critically.

Recognizing the obvious age differences between the post-RN and undergraduate nursing students, the researcher did not regard this to be problematic: as a whole, the critical thinking dispositions literature does not suggest that there are significant differences related to dispositional scores and age (Claytor, 1997; Clizzizza, 1970; Facione et al., 1995; Feely, 1975; Rudd, Baker et al., 2000). Similar observations need to be made about the two nursing groups

with respect to writing. While the older group had more life and clinical experiences to describe in their writing, many of them had been away from formal writing for some time. The younger group, on the other hand, may have had less to write about; however, they had the advantage of uninterrupted writing experience.

The researcher recognizes that the differences between the two nursing groups were genuine and, hence, acknowledges the possible impact of confounding variables. This noted, sensitivity to research design issues was demonstrated in the decision to use a pre and postdesign whereby each participant acted as his or her own control. The researcher also deliberately chose to include a second comparison group.

The second comparison group was composed of undergraduate students taking a term-length, university-level online (WebCT) course in sociology called The Sociology of Adolescence. In this sociology course, students examine the social factors which affect the behaviour and development of adolescents. The sociology course, like the course taken by the post-RN nurses, was designed by the Centre for Continuing Education while subject matter expertise was provided by the involved department, Laurentian University's Department of Sociology. As an experienced distance education teacher, the female instructor is a full-time member of the Department of Sociology.

In summary, the comparison group included 50 students: 28 undergraduate nursing students and 22 undergraduate sociology students. With the 34 post-RN nurse-participants, this led to a total of 84 student participants in the study. It is interesting to note that the participation rates for the comparison groups were higher than for the experimental group. In the case of the undergraduate nursing students, 60% of students in the class agreed to participate while 50% of the sociology students participated in the study. It is suggested that these higher participation

rates in relation to the lower participation rate by the post-RN nurses (26%) may point to the situational uniqueness of the post-RN learners.

All instructors were invited to participate in whatever parts of the project they wished. The two part-time instructors of the post-RN nurses participated in interviews.

Instruments

The study was conceptualized as a mixed methods, quasi-experimental (before and after) design with quantitative and qualitative components (Creswell, 2003). Data were generated in five ways: two questionnaires completed in pre and postcourse contexts, writing samples completed near the end of the term, bulletin board contributions, and observations made by the researcher of the bulletin boards as they evolved.

Questionnaires (quantitative data). The researcher purchased the right to use the California Critical Thinking Disposition Inventory—henceforth called the CCTDI (Facione et al., 1998)—as the core component of both questionnaires (Appendices A and B). A number of additional questions designed by the researcher related to the project's focus were included in each survey.

The CCTDI is a validated 75-item attitudinal measure that uses a six-point forced-choice Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree) to generate a profile of a person's overall disposition towards critical thinking. Seven specific sub-scales are also assessed: they are truthseeking (T), openmindedness (O), analyticity (A), systematicity (S), critical thinking self-confidence (C), inquisitiveness (I), and maturity of judgment (M).

Because of the forced-choice nature of the scale and the item format, scores for the seven sub-scale scores range from 10 up to 60. Each CCTDI item targets one of the seven sub-scales, and each scale score is derived from the set of items that targets the scale. Persons with a

negative disposition earn 1, 2, or 3 points per item while persons with a positive disposition earn 4, 5, or 6 points.

Each of the seven sub-scales ranges from 10 up to 60. The recommended positive cut score for each scale is 40; any score below 40 is considered weak at best since scoring below 40 requires scoring some items negatively. The suggested targeted score is 50. Persons who score above 50 on a scale are strong in that dispositional aspect. Scores from 31 to 39 are regarded to indicate ambivalence towards the disposition; that is there is no clear expression of either a positive or a negative disposition. Persons who score below 30 on a scale are negatively disposed in the identified disposition.

Overall scores are based on the sum of the seven separate scores and range from 70 up to 420; a score of 280 is regarded to be the cut-off indicator of overall deficiency in disposition. Scores from 211 to 279 fall into the ambivalent range while scores below 210 indicate a significant opposition toward critical thinking. At the other end, scores from 281 to 349 indicate an increasingly positive overall disposition while an overall score of 350 or greater is a general indication of "across the board" strength in disposition towards critical thinking.

In interpreting scores, it should not be presumed that a person who scores well on a particular sub-scale can be predicted to score well across all seven sub-scales. Rather, it is suggested that persons often show significant strength in some areas and significant weakness in others. Because of this, it is recommended that evaluation of the sub-scales may be more meaningful than analysis of a total score which may obscure important differences across the sub-scales (Facione et al., 1998). Additionally, plotting a person's CT dispositions across the seven sub-scales and providing the necessary information to interpret them is a suggested way of identifying stronger and weaker areas.

Cronbach's alpha internal reliability indices of the seven scales range from .71 to .80 and have been consistently replicated: truthseeking .71, openmindedness .73, analyticity .72, systematicity .74, critical thinking confidence .78, inquisitiveness .80, and maturity of judgment .75 (Facione et al., 1998). The alpha reliability for the overall instrument, measuring overall disposition towards CT, is reported to be .91.

Any validity issues concerning the CCTDI should be considered in light of the development process for the tool and the developers' use of factor analytic methods to determine which items would comprise the final form of the test. An outcome of a two-year Delphi project on critical thinking representing the views of Canadian and American theoreticians from different disciplines, the CCTDI experienced several iterations before assuming its final form. Originally, 250 item prompts were developed and then screened by post-secondary educators for ambiguity and interpretation flaws. The resulting 150 items were piloted with students at three universities in Canada, California, and the mid-western United States. As a result of the pilot, 75 items were selected for the final form of the test based on internal consistency and ability to discriminate between respondents. To minimize the likelihood of socially desirable responses, the scale items are interspersed throughout the test and the names of the seven subscales are not revealed on the test.

As noted, in this research project, the CCTDI was the principal component of each survey. However, a number of project-specific questions were added to each survey. In the presurvey, questions were posed about age, gender, employment status, educational goals, prior experience with online learning, expectations regarding support, level of perceived competence in areas frequently required in online learning, understanding of the term "critical thinking," and understanding of the relationship between critical thinking and character. In the post-survey, questions were posed about changes in educational goals, use of course supports, technical

problems during the course, level of perceived competence in areas frequently required in online learning, the course's effect on critical thinking skills and dispositions, and recommendations for improvement.

All questions were based on study of the literature and the researcher's previous participation in three government-funded nursing education research projects. These projects included two Office of Learning Technologies (OLT) projects funded by Human Resources Development Canada and an Ontario Ministry of Health and Long-term Care project. Called Cardiac Care on the Web (2000), Nursing Health Assessment on the Web (2002), and Stroke Best Practices for Nurses: A Technology-enabled Education and Research Project (2006) respectively, these projects examined the experiences of working nurse-learners in distance education contexts. Additionally, the Nursing Health Assessment on the Web and Stroke Best Practices for Nurses: A Technology-enabled Education and Research projects explored nurses' development as critical thinkers. Building on the findings of these projects, the questions for the present study were reviewed for clarity of expression by a Laurentian University researcher.

In both instances, the surveys were organized such that the CCTDI was completed first. This was to ensure freshness of response on the part of the participant to the critical thinking items.

Critical thinking scores based on writing samples (quantitative data). The second source of data came from written assignments completed near the end of the course by participants from all three courses (Appendices C, D, E). In each instance, there was a focus on critical thinking in the assignment as suggested in the description of the assignment for the post-RN nurses and through communications with the other involved instructors (P. Bailey, private communication, January 10, 2005; K. Tilleczek, private communication, January 10, 2005).

Each sample was scored by two different graders from Laurentian University. The scorers had similar backgrounds in the teaching and assessment of writing; each teaches in the Department of English at Laurentian University and has more than 20 years of teaching experience in writing. In all instances, the scores were based on a four-point rubric called the Holistic Critical Thinking Scoring Rubric where 4 is high and 1 is low (Facione & Facione, 1992) (Appendix F). A score of 4 means that the writer consistently does all or almost all of the following: accurately interprets evidence, statements, graphics, questions, etc.; identifies the salient arguments (reasons and claims) pro and con; thoughtfully analyses and evaluates major alternative points of view; draws warranted, judicious, non-fallacious conclusions; justifies key results and procedures; explains assumptions and reasons; and follows where evidence and reasons lead. A score of 1 means that the writer consistently does all or almost all of the following: offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others; fails to identify or hastily dismisses strong, relevant counter-arguments; ignores or superficially evaluates obvious alternative points of view; argues using fallacious or irrelevant reasons, and unwarranted claims; does not justify results or procedures, nor explain reasons; maintains or defends views based on self-interest or preconceptions; and exhibits close-mindedness or hostility to reason (Facione & Facione).

While there are other rubrics available for assessment of critical thinking, the researcher chose this one for two reasons. The first reason is that it is based on the critical thinking work of the authors of the CCTDI (Facione & Facione, 1992). Given the different understandings of critical thinking in the literature, it was decided that this was an appropriate choice. As well, the graders had had experience with a comparable four-point scoring grid based on their participation in the Writing across the Curriculum (WAC) program at Laurentian University.

As previously noted, this activity was conducted by two independent raters: the researcher and a university instructor with similar credentials and educational experience. The researcher took one hour with the second rater to familiarize her with the rubric and the assignments. Correlation of the scores provided by the two raters was conducted to determine inter-rater reliability.

Interviews: Students and instructors (qualitative data). Interviews with single students and pairs of students were conducted with 14 participants from the experimental group (Appendix G). Originally, the researcher had planned to conduct focus groups. However, due to the number of participants and their differing availabilities, interviews were conducted. Because these participants were working nurses, times were organized based on the nurses' schedules and ranged from 8 am to 8 pm ET. Sessions lasted approximately one hour and occurred via bridged teleconferences at no cost to the participants. Telephone sessions were necessary since participants lived across the province. The sessions were conducted shortly after completion of the course so as not to lose the opportunity to connect with the participants given their busy personal and professional lives and the fact that many of them lived at a distance from Sudbury.

The researcher facilitated the sessions working from a predetermined set of questions while a research assistant listened and made extensive notes. The sessions were not taped due to the fact that, at the time of the interviews, the conferencing system available to the researcher

was experiencing technical difficulties. The main problem was that one speaker would talk over another and, as a result, good quality audiotapes were not possible. It was, therefore, decided that the strategy of a research assistant dedicated solely to listening and taking notes was appropriate. Effort was made to elicit responses from all participants to all questions.

During the sessions, a number of open-ended questions were posed. The nature of the questions derived from review of the relevant literature, themes emerging from a preliminary analysis of the quantitative data, and observations made by the researcher as the course unfolded. The researcher had been granted permission by the instructors to observe the contributions made to the course bulletin boards over the term. Students were advised by the instructors of the researcher's observer role by postings made to the bulletin boards. Questions explored the participants' reasons for taking the post-RN degree program at this time, the decision to study at Laurentian University, the challenges of online courses, whether or not the course enhanced their disposition towards critical thinking, bulletin board participation, academic writing in the course, and changes they would recommend to the course. Unsolicited comments about their instructors were also captured in the sessions.

The choice to include student-based sessions in the project was not only to generate additional data to complement and perhaps support the data provided in the questionnaires. In addition, it was important to the researcher to provide participants the opportunity to have a strong voice in the project. This is in line with the fact that, in educational research, student voice is increasingly recognized for its importance (Erikson & Schultz, 1992; Levin, 1995; Rudduck, 1996).

Two instructors for the experimental group (Appendix G) agreed to be interviewed. The interview was conducted in the same way as the student interviews: open-ended questions were presented for feedback. The questions were based on review of the relevant literature, themes

emerging from a preliminary analysis of the quantitative data, and observations made by the researcher as the course unfolded. The specific areas explored included relevant educational and nursing background, their sense of the students, possible impact of the course on the students as critical thinkers, academic writing, bulletin board work, and interacting with students.

Bulletin board contributions: Students and instructors (qualitative data). The final source of data was the bulletin board as it was used by the post-RN nurses. For both students and instructors, it was a repository of data that complemented and often elaborated points raised in the interviews.

As noted earlier, the course was divided into three sections, each with its own instructor and bulletin board. This situation provided the researcher the opportunity to observe contrary approaches to management of an electronic bulletin board and interactions with students in the same course. Studying bulletin board contributions was appropriate because of the project's focus on a possible relationship between writing and critical thinking in online course environments. By approaching her topic from different perspectives through "juxtaposing analysis of different data types and methods" (Morse & Richards, 2002), the researcher was able to triangulate the data collection process.

Observations by the researcher of the bulletin boards (qualitative data). Because the researcher was given permission by the course instructors to observe the postings as they were made during the course, comprehensive notes pertaining to the evolution of the three boards were compiled. Similarities and differences regarding the organization and navigational functionality of the three boards were identified.

Data Collection Procedures

Greater emphasis was placed on quantitative data collection and analysis (Creswell, 2003). Quantitative data were collected first followed by the qualitative components. Because of

this approach, the results of the project are presented in two chapters, progressing from quantitative results (Chapter IV) to qualitative findings (Chapter V).

The quantitative data were gathered by means of the two questionnaires. Except by the participants in face-to-face nursing course, these questionnaires were completed on line. A web link with an explanatory note was provided to the participants via their respective bulletin boards. This link took the participants directly to the survey which took approximately 15-20 minutes to complete. The decision to use a web-based tool was logical since these participants were enrolled in web-based courses. The first survey was available to students during the first two weeks of the term while the second survey was available beginning the second last week of the term.

All students in the two WebCT courses received a letter of information (Appendix H) about the project and a consent form (Appendix I) through regular Canada Post mail. Signed consent forms were returned in postage-paid envelopes to the researcher. As required, ethics approval for the project had been procured through the Research Ethics Boards (REB) at Laurentian University and the University of Windsor.

In the case of the participants in the face-to-face, undergraduate nursing course, the researcher made a classroom visit in the first week of classes to invite participation, collect signed consent forms, and administer a hard copy (print) version of the same presurvey. A second visit was made in the second last week of classes to distribute the second survey. The instructors were not present on either occasion in order to minimize the situation that students might feel pressured to participate. It was also anticipated that, in not having the instructors present, students might be more honest in their comments than otherwise.

As previously indicated, the interviews occurred after all quantitative data had been collected. Of the total number of participants in the experimental group, 41.2% volunteered to take part in interviews. These sessions occurred as planned.

Regarding the interview with the two instructors, written permission was sought of the instructors to use their comments in the project. This session unfolded as planned.

Two further important components of the project were the bulletin board contributions and the writing samples. In many instances, the bulletin board data elaborated the quantitative results and ideas presented in the interviews. As indicated, the researcher observed the contributions as they were made and examined them at the conclusion of the course in hard copy. The writing samples were voluntarily provided by participants who understood that this written work would be analyzed. Of the 84 participants in the project, 58 contributed writing samples.

The project's mixed methods design brought the benefits of different types of data collection to the project. Through the quantitative methods, differences in critical thinking dispositions before and after the course were identified. The qualitative data helped discover, describe, and, in some cases, explain the participants' actual experiences related to critical thinking in an online course setting and the online nursing education culture.

Data analysis. Descriptive statistics were prepared based on the data offered by the participants in the surveys. Data pertaining to gender, age, educational status and goals, employment status, geographical communities, and prior experience with online education comprised these statistics.

Analysis of participants' self-perceptions of competence in skill areas generally required in university-level online courses—use of the computer, use of the Internet, keyboarding skills, and university-level writing—was conducted. Based on these data, a three-way ANOVA with Group, Scale, and Time as the independent variables was also performed.

The primary statistical analysis used for the quantitative data based on participants' completion of the CCTDI was a 3 x 7 x 2 three-way ANOVA with repeated measures on the last two variables. The independent variables were Group (experimental, comparison #1, comparison #2); Scale (truthseeking, openmindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, and maturity in judgment); and Time (pretest, posttest).

A one-way ANOVA was computed for the writing scores for the three groups. As indicated, the scores were generated for written assignments completed near the end of the course. They were based on a rubric ranging from 1(low) to 4 (high). For this statistical work as well as all other statistics generated for the project, an alpha level of 0.05 was selected for statistical significance.

Based on strategies from focused ethnography, the qualitative data generated by the interviews, the bulletin board contributions, and the researcher's observations became the basis of detailed descriptions that represent the participants as working nurse-learners sharing the same online course experience. Using Nudist as well as hand coding techniques, the researcher organized the qualitative data based on the bulletin board and her personal observations of the bulletin board into themes based on the topics explored in the interviews. The resulting data groups were then analyzed for what Wolcott (1994) calls patterned regularities. These patterned regularities are offered as findings that build on the quantitative data.

The following two chapters present the results of the study and reflect the design of the project, progressing from quantitative findings (Chapter IV) to qualitative findings (Chapter V).

Chapter IV

Quantitative Results

Context and Participants

Quantitative results are based on the contributions of 84 participants who completed the pre and postsurveys: 34 in the experimental group (online course, post-RN nursing students); 28 in comparison group #1 (face-to-face course with optional online bulletin board, undergraduate nursing students); 22 in comparison group #2 (online course, undergraduate sociology students). Demographic data, self-report data related to online education, the participants' CCTDI scores, and scores assigned to writing samples from all groups are presented.

Gender and age. By gender, the experimental group was exclusively female. With the exception of a single male in comparison group #1, the two comparison groups were also female. When age was configured in terms of two categories, it was apparent (Table 10) that the experimental group was made up of a larger portion of older students, $\chi^2(2) = 21.73$, $p < .001$.

Educational status and goals. Asked about their highest level of education as they started the course, 4.5% of respondents in the experimental group indicated that Grade 12 was their highest level of education while 9.1% reported that Grade 13 was their highest level. The participants who reported no postsecondary education were the more experienced participants who had "trained" to become nurses within the hospital training programs that dominated nursing education before nursing became a discipline of study offered by community colleges and universities. All participants in the two comparison groups reported university education to be their highest level of education. This is not surprising since, in both groups, the participants were enrolled in upper-year university courses.

Table 10

Age Distribution Frequencies for Two Age Groups for Participants in Experimental and Comparison Groups

Age categories	Experimental	Comparison #1	Comparison #2
20-35	12	25	17
36+	21	3	4

Table 11 presents the participants' educational goals. Participants were invited to choose as many items as applied from six choices. As the table reveals, the goal of career advancement was the only goal different at a statistically significant level.

Employment status. When asked about employment status, 67.6 % of participants in the experimental group indicated that they were working full-time while 29.4% reported working part-time. Some of the more specialized kinds of nursing the post-RN nurses reported working in include public health, clinical education, community health, and management.

In comparison group #1, 48.1% reported working part-time; 44.4% not working at all; and 7.5% full-time. These nurse-learners in contrast with the nurses in the post-RN program are undergraduate students with fewer financial, family, and community obligations. In comparison group #2, 35.0% indicated that they were working full-time; 53.0% part-time; 12.0% not at all. The kinds of work the participants reported varied from the retail and service industries to counselling, teaching, management, and social service.

Geographical communities. The geographical communities of the nurses from the experimental group and comparison group #2 are found in Table 12. All participants in comparison group #1 were living in the Sudbury region at the time of the study. This is appropriate since this course was a traditional, face-to-face course delivered on the university campus.

As Table 12 reveals, 14.7% of participants in the experimental group and 54.4 % of participants in comparison group #2 were from Sudbury, suggesting that online courses are being taken not solely by those who live at geographic distance from a university.

Table 11

Educational Goals with Chi-Squared Analyses p-values Reported

Goal	Experimental (n=34)	Comparison #1 (n=28)	Comparison #2 (n=22)	p
University degree	90.6 %	96.4 %	100.0 %	.28
University credits	9.4 %	21.4 %	28.6 %	.19
Continuing education	59.4 %	32.1 %	33.3%	.06
Career advancement	62.5 %	28.6 %	2.5 %	.03
Personal growth	71.9 %	60.7 %	57.1 %	.49
Other	3.1%	7.4%	0.0%	.40

Table 12

Geographical Communities

Region	Experimental (n=34)	Comparison #2 (n=22)
Greater Region of Sudbury	14.7%	54.4%
Northeastern Ontario (excluding Sudbury)	32.4%	22.7%
Northwestern Ontario	0.0%	0.0%
Central Ontario	0.0%	4.5%
Greater Toronto Area	14.7%	0.0%
Southwestern Ontario	23.5%	4.5%
Eastern Ontario (Ottawa Valley Area)	2.9%	9.1%
Other	2.9%	4.5%

While the focus of the study was the respondent group, the researcher did try to develop a demographic profile of the nurses who chose not to participate in the study. She contacted the Centre for Continuing Education and the School of Nursing and asked about acquiring demographic data for the non-participating nurses. The Centre for Continuing Education was unable to provide any information. The School of Nursing through the post-RN Coordinator, however, provided the researcher with information about gender and the home communities of the nurses. Regarding gender, all non-participating nurses were female. Additionally, when the nurses' home communities were organized by area (Greater Region of Sudbury, Northeastern Ontario, Northwestern Ontario, and so forth), the breakdown of regions matched those noted in Table 12. No additional data were available regarding the non-respondents.

Self-report Data Related to Online Education

Experience and competence with online education and modalities. Asked if they had ever taken an online course or a course with online components such as an Internet-based communication tool before this study, 65.8% of respondents in the experimental group said they had. By comparison, 85.7% and 17.2% in comparison group #1 and comparison group #2 reported they had. The high percentage of undergraduate nurses who responded that they had previously taken an online course/course with online components may be a reflection of the School of Nursing's commitment to incorporate online components into all courses and programs. As a result, it is not surprising that, by the third year of the undergraduate program, students have acquired *some experience with online education.*

Table 13 displays participants' reported prior experience with Internet-based communication tools. While there was an absence of an effect noted for e-mail, group differences for chat and bulletin board were found to be significant. It is suggested that these differences may be related to greater experience with these tools by younger participants.

Table 13

Reported Use of Internet Technologies (Precourse)

Tool	Experimental (n=34)	Comparison #1 (n=28)	Comparison #2 (n=22)	p
Email	93.8%	96.4%	100.0%	.50
Chat	56.3%	85.2%	81.0%	.03
Bulletin Board	64.5%	92.9%	33.3%	.00

In the precourse period, participants in all three groups were asked about their self-perceptions of competence in four skill areas generally required in university-level online courses: use of the computer, use of the Internet, keyboarding skills, and university-level writing. For each variable, a one-way ANOVA was conducted. As Table 14 indicates, the only variable that showed a statistically significant difference was writing. The experimental group reported significantly poorer scores for writing than both comparison groups ($p < .01$). In the postcourse context, participants in comparison group #1 were not asked to complete the ratings. Their course was not an online course but a face-to-face course with an optional course web site which was rarely used by the students.

A MANOVA was computed for the four self-perceived competencies with group (experimental, comparison group #1, comparison group #2) as the independent variable. There was a main effect for group, $F(8, 152) = 2.9, p < .01$, which the subsequent univariate analyses revealed to be due to writing, $F(2, 78) = 9.03, p < .001$. The posthoc analyses showed that the experimental group was significantly poorer than both comparison groups on the writing measure ($p < .01$).

To examine change over time, a 2 x 4 x 2, three-way ANOVA was run with Group (experimental group, comparison group # 2), Scale (computer, Internet, keyboarding, and writing), and Time (pretest, posttest) as the independent variables. Comparison group #1 was not included as no posttest data were available. The main effects for time, $F(1,51) = 4.99, p < .05$ (higher performance on the posttest), scale, $F(3, 49) = 28.13, p < .001$ (lower performance on writing), and group, $F(1, 51)$ 9.4, $p < .01$ (lower performance by the experimental group) were qualified by a three-way interaction effect for the tests of within subjects effects, $F(3, 153) = 3.42, p < .025$. The posthoc analyses showed the interaction effect was due to a posttest increase for the experimental group only, and only in the area of writing, $t(31) = 3.55, p = .001$. The large

Table 14

Reported Competence with Modalities of Online Education (Pre and Post)

Area of self-perceived competency	Group	*n*		*M*		*SD*	
		Pre	Post	Pre	Post	Pre	Post
Computer	Experimental	32	34	3.81	3.82	.69	.80
	Comp. #1	28	--	3.96	--	1.00	--
	Comp. #2	21	22	4.29	4.32	1.06	.72
Internet	Experimental	32	34	4.00	4.03	.80	.94
	Comp. #1	28	--	4.18	--	.77	--
	Comp. #2	21	22	4.24	4.45	1.00	.67
Keyboarding	Experimental	32	34	4.06	4.06	.88	1.13
	Comp. #1	28	--	4.29	--	.94	--
	Comp. #2	21	22	4.67	4.73	.80	.77
University-level writing	Experimental	32	34	2.69	3.24	1.35	1.02
	Comp. #1	28	--	3.64	--	.83	--
	Comp. #2	21	22	3.67	3.73	.58	.55

difference in writing between the two groups at pretest is seen in Figure 2. It was dramatically mitigated at posttest, apparently as a function of the course experience.

CCTDI Scores

Participants' completion of the CCTDI in the pre and postcourse settings generated two sets of scores for each participant. Each set of scores included an aggregate score and seven discrete scores for the seven critical thinking dispositions: truthseeking, openmindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, and maturity. These scores are summarized in Table 15.

A three-way (3 x 7 x 2) ANOVA was run on the data using Group (experimental group, comparison group #1, comparison group #2), Scale (truthseeking, openmindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, maturity), and Time (pretest, posttest) as the independent variables, with Scale and Time treated as repeated measures. There was a main effect for group, $F(2, 81) = 2.28$, $p = .05$, and the posthoc tests indicated that this was due to a difference between the two comparison groups (comparison group #1 $M = 294.84$, $SD = 21.87$; comparison group #2 $M = 312.59$, $SD = 40.05$, $p < .05$). Group did not interact with scale or time ($p > .1$). The main effect for scale, $F(6, 76) = 60.12$, $p < .001$, is qualified by a scale by time interaction effect, $F(6, 76) = 2.91$, $p < .025$. The interaction effect is due to greater scores on truthseeking at posttest, $t(83) = 1.98$, $p = .05$, as may be seen in Figure 3. It seems that students generally show gains in truthseeking as a function of their university experience.

Age. Regarding age (younger, older), there was a clear imbalance. There were more older students (36+ years of age) in the experimental group (21 vs. 7) and more younger students (<36 years of age) in the comparison group (42 vs. 12), χ^2 (1) = 21.36, $p < .001$. However, preliminary

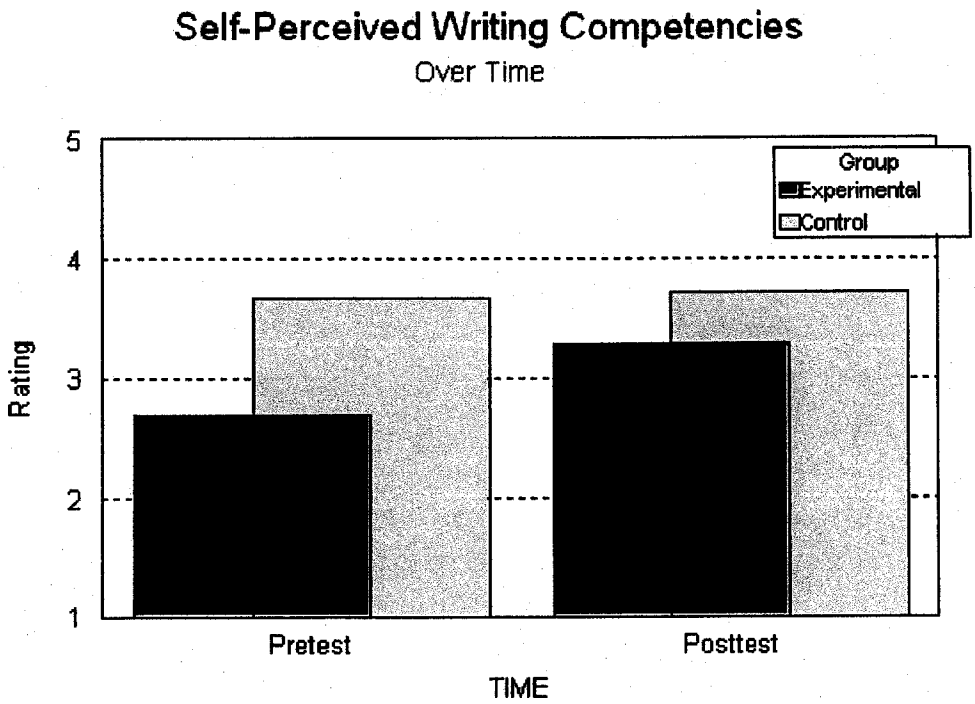

Figure 2. The interaction effect is due to the large difference in writing ratings at pretest that are not seen at posttest. The only posttest gain was in writing and that only for the experimental group.

Table 15

CCTDI Scores

Variables	Group	*M*		*SD*	
		Pre	Post	Pre	Post
Truthseeking	Experimental	36.85	38.53	5.93	6.95
	Comp. #1	36.25	36.71	5.60	5.56
	Comp. #2	38.55	39.55	8.43	7.91
Openmindedness	Experimental	42.35	43.09	4.56	4.63
	Comp. #1	42.14	43.11	6.25	6.45
	Comp. #2	45.23	45.82	6.65	7.64
Analyticity	Experimental	45.41	44.56	4.59	5.02
	Comp. #1	42.25	41.68	5.28	5.33
	Comp. #2	43.41	42.77	8.00	7.58
Systematicity	Experimental	42.15	42.97	7.63	8.07
	Comp. #1	39.21	41.36	5.83	5.59
	Comp. #2	43.45	43.18	7.86	7.08
Critical thinking self-confidence	Experimental	45.29	44.15	7.01	6.14

	Comp. #1	42.82	42.46	6.90	6.66
	Comp. #2	46.95	46.91	8.04	8.77
Inquisitiveness	Experimental	49.53	49.21	4.89	6.82
	Comp. #1	47.82	47.79	5.12	5.75
	Comp. #2	51.82	49.32	5.17	7.96
Maturity	Experimental	43.56	44.59	6.39	7.50
	Comp. #1	43.21	42.86	4.95	5.15
	Comp. #2	44.73	43.50	7.83	9.23

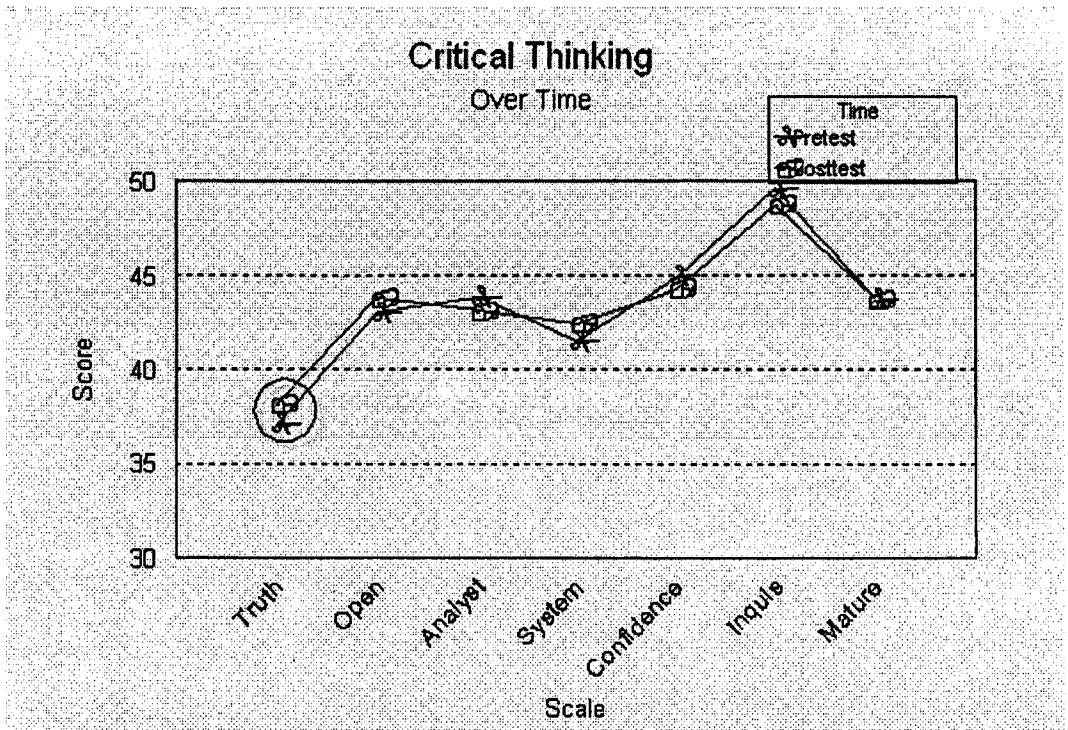

Figure 3. The interaction effect is due to the higher scores for truth in the posttest setting.

analyses indicated that there were no differences on the pretest and posttest total critical thinking scores nor on the self-perceived competencies (Table 16), with the exception of writing at the pretest level where the older students were showing less confidence, $F(1,78) = 5.05, p < .05$. All other comparisons were non-significant (Table 17). The age effect for writing is clearly linked to the number of older students in the experimental group who were returning to the academic environment with depressed writing confidence. This was evident in the previous analyses (Figure 2). This age effect is reported here as an addendum that assists in understanding the effects noted. The self-perceived reduced competence in writing for the experimental group students is tied to the age of these returning students.

Critical Thinking Scores Based on Writing Samples

Writing samples were voluntarily provided by participants with representation from each course. For each course, the writing sample was based on the same assignment completed near the end of the course. While the assignments varied in length and topic because of the different course content areas, according to all involved instructors, each assignment involved application of critical thinking.

As outlined in Chapter III, each sample was scored twice by the researcher and a second researcher with comparable experience as an instructor of writing at Laurentian University. A four-point critical thinking rubric for the scoring of writing for demonstration of critical thinking (4 being strong and 1 being weak) was used by each scorer (Appendix F).

The scores provided by the second rater were used for analysis because of the possibility of an expectancy effect on the part of the researcher for the participants in the experimental group to do well. A one-way ANOVA based on these scores was computed for the writing results for the three groups (experimental group, comparison group #1, comparison group #2), and there was a main effect, $F(2, 54) = 3.99, p < .025$. The posthoc analysis showed the

Table 16

Means and Standard Deviations for the Pretest and Posttest Scores for CCTDI and the Self-Perceived Competencies

Scale	Age	*n*		*M*		*SD*	
		Pre	Post	Pre	Post	Pre	Post
Total CCTDI	20-35	54	54	300.87	299.59	31.72	34.66
	36+	28	28	309.96	313.25	22.27	29.89
Perception of competence:	20-35	53	29	4.09	4.03	.99	.94
computer	36+	27	25	3.78	4.00	.75	.65
Perception of competence:	20-35	53	29	4.21	4.14	.86	.99
Internet	36+	27	25	3.96	4.28	.81	.74
Perception of competence:	20-35	53	29	4.38	4.31	.90	1.11
keyboarding	36+	27	25	4.15	4.40	.91	1.00
Perception of competence:	20-35	53	29	3.47	3.45	1.01	.87
writing	36+	27	25	2.89	3.40	1.25	.96

Table 17

ANOVA Results for Ratings on CCTDI and Self-perceived Competencies

	df		*F*		*P*	
	Pre	Post	Pre	Post	Pre	Post
Total CCTDI	1, 80	1, 80	.82	3.13	.368	.080
Perception of competence: computer	1, 78	1, 52	2.14	.02	.147	.878
Perception of competence: Internet	1, 78	1, 52	1.50	.35	.225	.558
Perception of competence: keyboarding	1, 78	1, 52	1.15	.10	.287	.757
Perception of competence: writing	1, 78	1, 52	5.05	.04	.027	.847

Note: The values noted in Table 17 are based on separate one-way ANOVAs for pre and post scores.

comparison group #1 received slightly higher ratings ($M = 2.94$, $SD = 0.66$) than the experimental group ($M = 2.47$, $SD = 0.51$), $p < .01$. There were no differences with respect to comparison group #2 ($M = 2.63$, $SD = 0.52$) which may be related to the smaller sample size for this group ($n = 8$). It would appear that comparison group #1 showed greater proficiency in critical thinking as demonstrated in writing than the experimental group and comparison group #2.

The difference between the experimental group and comparison group #1 is interesting (Table 18). In the case of the experimental group, some participants had been away from writing for some time and may have been experiencing academic writing at university for the first time. In comparison group #1, the students had been exposed to writing at university for more than two years.

Given the problem with interrater reliability between the two sets of scores (.553), the reader is advised to be extremely cautious in considering these results. As an outcome of this concern, the researcher decided to conduct further analysis of the writing samples. First, she had the writing samples scored a third and fourth time by two other raters with backgrounds similar to those of the first and second raters; next, she analyzed the writing samples using a framework that tracked elements suggested by composition experts to be components of writing competence; finally, she conducted a thematic analysis of the samples based on findings related to the CCTDI scores and in particular the disposition called truthseeking.

In these next two sections, the findings related to the additional scoring activity and the writing competence framework are described. Findings based on the thematic analyses are described in Chapter V.

Table 18

Means and Standard Deviations Based on Critical Thinking Rubric

Scorer 2	*n*	*M*	*SD*
Experimental	32	2.47	.51
Comp. #1	18	2.94	.66
Comp. #2	8	2.63	.52
Total	58	2.63	.59

Further Scoring of Writing Samples

The interrater reliability problem was not addressed through additional scoring with reliability co-efficients of .085 and .229 for the third and fourth raters respectively. This suggests that subjective judgements of written texts by even experienced scorers are generally unreliable. It should be noted that, in this study, the researcher had trained the scorers before the scoring occurred and that each rater was provided copies of the assignments and the scoring rubric.

Analysis for Writing Competence

Each writing sample was examined for five variables: spelling, word choice, grammar, vocabulary, and sentence length. Values for spelling, word choice, and grammar were generated by a count of the number of errors found in each writing sample. Vocabulary was assessed as the number of words eight letters in length or longer. Mean sentence length was determined by counting the number of words in sentences. Indices were used to comparison for quantity of writing as the samples varied in length with some participants writing less than 500-word assignments. The index was obtained when the measure of interest was multiplied by 100 and divided by the sample size.

Errors related to run-on sentences, comma splices, and sentence fragments were categorized as grammatical errors. Punctuation was not considered to be a separate variable since errors related to terminal punctuation (periods, semi-colons, and colons) were accounted for in the grammar category. Errors in comma usage were not recorded in that there is considerable discretion in how writers use the comma; additionally, errors in comma usage are not typically regarded to be serious writing problems.

For the five variables, a one-way ANOVA was conducted for each index (Table 19). There were no statistically significant differences among groups for spelling (F (2, 54) = .21, p = .812); word choice (F (2, 54) = 2.62, p = .082); or sentence length (F (2, 55) = 0.95, p = .393).

Table 19

Means and Standard Deviations Based on Analyses of Writing Samples

Index	Group	*n*	*M*	*SD*
Spelling	Experimental	32	.29	.509
	Comparison #1	18	.30	.248
	Comparison #2	8	.19	.109
Grammar	Experimental	32	1.40	1.030
	Comparison #1	18	.67	.467
	Comparison #2	8	1.04	.481
Word Choice	Experimental	32	.66	.486
	Comparison #1	18	.97	.653
	Comparison #2	8	.54	.218
Sentence Length	Experimental	32	3.79	.828
	Comparison #1	18	4.09	.705
	Comparison #2	8	4.07	.926
Vocabulary	Experimental	32	19.45	6.309
	Comparison #1	18	24.74	3.640
	Comparison #2	8	14.38	2.399

There were significant group differences for grammatical errors ($F(2, 54) = 4.22, p = .020$) and vocabulary ($F(2, 55) = 12.09, p = .000$). Posttests for grammatical errors revealed that the experimental group had made a greater number of grammatical errors. Posttests for vocabulary showed lower vocabulary scores by the experimental group in relation to comparison group #1. The experimental group did score higher than participants in comparison group #2 for vocabulary complexity. The lower scores of comparison group #2 for vocabulary may have been due to the nature of the assignment which was autobiographical and, hence, might have led to simpler vocabulary choices by the students than they might make otherwise.

Chapter V

Qualitative Results

The results reported in this chapter are based on thematic analysis of the writing samples from participating students and the interviews. Illustrative comments taken from bulletin board activity are also included. Taken together, these data elaborate and complement the quantitative findings.

As previously noted in Chapter IV, writing samples were volunteered by student-participants from across the participant group. In addition to being studied for components related to writing competence (Chapter IV), the samples were coded for demonstration of Johns' (1995) four ways of knowing. The decision to code the writing samples for the ways of knowing was based on quantitative findings related to an interaction effect involving the critical thinking disposition called truthseeking.

Regarding the interviews, they were conducted via conference calls at no cost to the participants and times convenient to the participants from 8 am to 8 pm ET. Sessions lasted approximately one hour. The researcher presented a set of standard questions and prompted for elaboration when relevant. Notes were taken by the researcher and a research assistant who did not participate verbally in the conferences. Two instructors and 14 nurse-participants from the post-RN group participated in the sessions.

The comments included from the bulletin board are offered as elaborations of points made in the interviews. It is acknowledged that the researcher observed the bulletin boards as they evolved and examined them at the end of the course.

Ways of Knowing (Johns, 1995) in Writing Assignments

The decision to code the writing assignments for Johns' (1995) ways of knowing was due to an interaction effect for truthseeking as a function of university experience. As Johns' ways of knowing pertain specifically to nurses and were part of the curriculum covered by the course taken by the post-RN nurses, the framework was an appropriate tool for analyzing the writing samples submitted by the nursing students. Although the students in comparison group #2 were not nurses, the framework was appropriate for them considering the personal and reflective nature of their writing assignment. The researcher has used Johns previously in work with two research teams from Laurentian University's School of Nursing and has been the primary author for two peer reviewed articles as a result of this work (Carter, Rukholm, Viverais-Dresler, Bakker & Sheehan, 2006; Carter & Rukholm, 2002).

In this project, as in the previously noted projects, Johns' (1995) terms "knowing" and "ways of knowing" (Appendix J) were changed to "thinking" and "kinds of thinking." While there are distinctions between knowing and thinking, it is appropriate to have made this modification for two reasons. The first pertains to the finding that the disposition of truthseeking was an area of growth related to university experience. Truthseeking as defined by Facione and Facione (2000) is about "asking questions, and [being] honest and objective about pursuing inquiry"; stated another way, it is an active process such as thinking is. Hence, it follows that analysis of the writing samples would involve consideration of different kinds of thinking. Secondly, when Johns' four categories are broken down as questions as they are in Appendix J, they become a kind of scaffolding to identify four kinds of thinking.

The four different kinds of thinking are called aesthetic, personal, ethical, and empirical. Aesthetic thinking involves challenges to the self: the nurse reflects on what he or she is trying to achieve and the course of action taken. Personal thinking focuses on the nurse's feelings. Ethical

thinking deals with the issue of congruence between the nurse's actions and value system. It is about responding to questions such as the following: "How did my actions match with my beliefs?" and "What factors made me act in ways that do not fit with my values?" Finally, in empirical thinking, the nurse reflects on how nursing knowledge informs practice.

In order to analyze for the four categories, the researcher read all samples twice to gather a general sense of the assignments. Subsequently, individual assignments were read, and discrete ideas were coded as responding to the questions noted in Appendix J. Where there was ambiguity, sections were re-read until the researcher was confident in her final decision. Based on the theme coding exercise, the following section explains what each assignment tended to demonstrate about the different ways of thinking and provides a detailed discussion of one student assignment for each different assignment. The discussion progresses from the written work completed by the post-RN learners in the experimental group to the work done by participants in each of the comparison groups.

The assignment completed by the post-RN nurses (Appendix C) was constructed around a case study with a family focus. Thinking as a community nurse, the nurse-writer was asked to demonstrate critical thinking by responding in narrative form to four questions. The second of two formal or graded postings—each was worth 10% of the student's final standing in the course—, the posting was evaluated on the basis of content as well as inclusion of references to evidence-based practice literature.

The questions that comprised the core of the assignment are as follows: What actual data or information do I have about this case? What other data do I need to better understand this situation? What are my provisional hypotheses (problem or need statements)? What learning issues have I identified in this case? While no length requirement was stipulated, the postings tended to range from 500 to 800 words in length.

The way of thinking demonstrated most frequently in this assignment was what Johns (1995) calls empirical. For example, in every case ($n = 32$), the student began with an iteration of what was empirically known about the family and the family's life situation based on the case study description. There was also some demonstration of aesthetic thinking; that is thinking that explores questions such as what was I trying to achieve and why did I respond as I did. This kind of thinking tended to occur in statements wherein the writer reflected on her role as a care provider for the family. At times, this self-assessment was visible in the words the writer used while, on other occasions, it was more subtle and found in the tone of the text. Not a dominant form of thinking in this assignment, personal thinking was minimally evident. Personal thinking tended to occur when the writer described how she felt about the situation. This kind of thinking is revealed in the following passage:

> This student chose to complete a case study about a woman with two small children at home: a child of 28 months and a new baby of three months. At home on maternity leave, this new mother is having trouble managing the routines of a young family; she also feels that her husband is becoming impatient with the situation.
>
> The evidence of Johns' different ways of thinking in the student's analysis of the case was ranked as follows: 26 examples of empirical thinking, 12 examples of aesthetic thinking, 5 examples of personal thinking, and 1 example of ethical thinking.
>
> As illustrations of empirical thinking, the student offered two main kinds of statements: the first pertained to what she knew about the family based on the case, "With regard to marital status, we are told that Carol is married to Ron who works full-time hours from 6-8pm nightly." A second form of empirical thinking occurred when the writer connected her ideas to relevant nursing-based literature, "'Most depressed post-partum

women have self-esteem which is reinforced by the infant's temperament. An infant such as Sophie who is irritable and demands more from a fatigued mother who has limited support from a significant other can experience an increase in depressive symptoms'" (Allender & Spradely, 2001).

The assignment also showed, at different points, the writer to be engaged in what Johns (1995) refers to as aesthetic and personal thinking. Instances of the former occurred near the beginning and middle of the assignment when the writer was discerning what she needed to know about this family in order to assist it, "It is not mentioned that Ron is the father of both children but I will assume he is." Although the writer's assumption may be incorrect, the passage does demonstrate awareness of a need to gather further information. Additionally, the writer is self-aware of the act of making assumptions.

Evidence of personal thinking tended to occur near the end of the assignment when the writer described her thinking process, "By analyzing this scenario, I chose to seek more information and apply some logical reasoning by utilizing literature of child/family development."

The assignment included one instance of ethical thinking. In this statement, a situation of incongruence at the level of personal belief is presented, "Some of my beliefs were inconsistent with the factual information making this a learning experience for me."

The assignment completed by participants in comparison group #1 (Appendix D) involved preparation of a critical literature review based on a nursing topic of the writer's choice. Like the post-RN nurses, these nurse-students were asked to prepare an assignment that showed mastery of English composition and APA writing conventions. The length requirement was eight to ten pages.

Because of the design and criteria of this assignment, the way of thinking demonstrated almost exclusively was empirical. Although the assignment description did not specify that expression of personal ideas or experiences was unacceptable, this appeared to be the students' understanding: there was almost no evidence of the other ways of thinking suggested by Johns (1995).

This student explored the topic of palliative care. Her assignment used headings typically associated with a literature review: introduction, description of the literature, summary, limitations, and conclusion.

While a reader would not expect demonstration of the four ways of thinking in the body of an assignment such as this, he or she might expect some form of thinking other than empirical thinking in the sections called limitations and conclusion. This, however, was not the case in this student's work; rather, like the earlier parts of the assignment, these sections were characterized by straightforward statements of fact unchallenged by the writer. Thus, in its entirety, the assignment moved back and forth between empirical statements such as "[t]he most common limitation encountered by the researcher in this review was sample size" and "[b]oth White et al (2004) and Hopkinson and Hallet (2001) believed that their samples were too small for the findings to be generalized and that the findings should only be applied to the context of their sample."

In this student's assignment, 46 examples of empirical thinking were identified. There is no evidence of the other ways of thinking.

The assignment completed by comparison group #2 participants (Appendix E) included many examples of empirical thinking; in addition though, it also tended to include examples of aesthetic and personal thinking and, on a limited number of occasions, ethical thinking. It is

suggested that this diversity was due not only to the topic but also to the point of view that the students were encouraged to assume. In this autobiographically-based assignment, students were asked to reflect on their adolescence and how various experiences in it signaled or affected the young person's emerging adulthood. If a student did not wish to prepare an autobiography, he or she was welcome to write a biography based on the life of a real or fictional individual. Students were further asked to connect their observations to the theories they were studying in the course. Like the assignment for the first comparison group, this assignment was to be between eight and ten pages.

This student chose not to use her own voice and, instead, she wrote a biography. Called "Hailey's Story," the text recounted the life story of a young woman growing up in the 1980s in a small northern Ontario community.

While there were clear moments of empirical thinking offered in relation to Hailey—"Her family did not have that much money simply because her father was the only parent able to work and provide for his family" and "Arnett stated that 'autonomy is to learn to be independent and self-sufficient, to think for themselves and be responsible for their own behaviour (Arnett, 2003)"—there were also many moments of thinking that demonstrated aesthetic, personal, and ethical thinking. The following statement is provided as evidence of aesthetic thinking, "Hailey herself struggled daily with both of these [identity exploration and instability]. She had an insatiable need to please others, a need to explore new relationships, a dedication to her family's expectations, and a need to find her own place within the world." As this passage reveals, the author is very aware of what Hailey was trying to achieve in her adolescent years.

As noted, the assignment also demonstrated personal and ethical thinking. "She

often felt that her parents just wouldn't understand" is one example of several cases of personal thinking found in the assignment. The statement "[t]he level of care needed by Hailey's mother was sometimes more than she could handle and conflict would arise" suggests ethical thinking.

The four kinds of thinking found in this student's assignment can be ranked as follows: 18 examples of empirical thinking, 8 examples of aesthetic thinking, 12 examples of personal thinking, and 6 examples of ethical thinking.

The previous discussion has highlighted the design and general criteria associated with the three different assignments. It has, in addition, offered commentary based on the work of one student from each participant group. Because it is also important to consider the performance of all participants in demonstrating the four different kinds of thinking, Table 20 presents the more general findings of the coding exercise.

The analysis presented in Table 20 reveals that students in the second comparison group displayed greater variety in their kinds of thinking as well as more thinking in general. It is suggested that this was due to the general topic and the criteria of the assignment. As noted earlier in this chapter, the assignment completed by this group was a reflective autobiographical

Table 20

Means and Standard Deviations Based on Ways of Thinking in Writing Samples Based on Johns (1995) Framework

Way of thinking	Group	*n*	*M*	*SD*
Empirical	Experimental	32	22.91	8.058
	Comparison #1	18	36.00	6.417
	Comparison #2	8	42.50	1.512
Personal	Experimental	32	.56	1.190
	Comparison #1	18	.00	.000
	Comparison #2	8	14.38	6.610
Aesthetic	Experimental	32	6.47	3.951
	Comparison #1	18	.61	1.037
	Comparison #2	8	18.25	5.092
Ethical	Experimental	32	.44	.716
	Comparison #1	18	.00	.000
	Comparison #2	8	3.63	1.847

assignment wherein the student was asked to recount pivotal adolescent events that may have contributed to the student's emerging adulthood and to connect these ideas to theories studied in the course. It seems reasonable to suggest that, when a person is writing about him- or herself, the writer has an "easy-to-access" repository of empirical data: no one can know the empirical events of a person's life better than the person him- or herself. In the assignment, this empirical data was then supplemented by connections made to course readings and lecture notes. The requirement that the writer was asked to reflect on these important life events would quite naturally foster thinking that Johns (1995) calls aesthestic and personal. Finally, it seems reasonable to suggest that, when a writer reflects on his or her adolescence, there might be instances of ethical thinking given the turbulence and conflict frequently associated with this life stage. As an aside, one of the scorers who had read all the writing assignments commented that, in her opinion, this was the most interesting and stimulating of the three assignments.

Extrapolating, the coding for different kinds of thinking exercise may provide support for the idea that written assignments can elicit different kinds of thinking. Therefore, if fostering of particular kinds of thinking is a valued educational goal, specific attention may need to be paid to assignment design. Additionally, if it is important for nurse-learners to practise different ways of thinking in the safety of a learning setting rather than in today's fast-paced clinical setting, it may be especially important for instructors to take time and care in the development of their written assignments.

Student Data: Interviews and Bulletin Board Comments

The ideas explored in the group sessions built on the themes explored in the questionnaires, previous studies in online nursing education the researcher has participated in, and her experience as an online instructor and student. The sessions occurred prior to full analyses of the quantitative data. This was necessary because many of the potential participants

were distance education students; not to have conducted the focus group sessions as soon as the course was completed might have meant losing the opportunity to do so. Table 21 provides background on the student-participants (Table 21).

Why are you taking your post-RN degree at this time? Asked why they were pursuing a nursing degree at this time, three cited personal learning (Students A, C, L). It is interesting that the three participants who cited personal learning were among the oldest in the sample. Four participants spoke about a degree as being pivotal to achievement of a professional goal (Students A, E, I, J). All participants spoke about the need for nurses to continue to study (Students A-N).

Why are you taking the post-RN program through Laurentian University? Of the 14 participants, seven commented on the program's accessibility and flexibility. Called the "pay off" of online learning (Student A), the participants indicated that accessibility and flexibility are necessary for a variety of reasons including schedules with shifts and part-time commitments. Four students spoke about the challenges of balancing work, study, and family responsibilities. In one instance, a mother of ten children due to a blended family situation revealed that she would not be able to study except for Internet-based education (Student L). In a second case, a new mother on maternity leave spoke of "stealing study time when the baby is asleep" (Student I).

Table 21

Profiles of Post-RN Students

Student	Age	Area of nursing practice	Geographic community	Previous online experience	General attitude toward this online course
Student A	49	Neonatalogy	GTA	Yes (1 course)	Very Positive
Student B	46	ET	S. Ontario	Yes (1 course)	Positive
Student C	47	Emergency; oncology	N. Ontario	Yes (5 courses)	Very Positive
Student D	34	Emergency	N. Ontario	Yes (3 courses)	Positive
Student E	46	_____	N. Ontario	No	Too much work; not enough time for interaction
Student F	42	Haemodialysis	S. Ontario	No	Overwhelmed at beginning; need the flexibility of online course
Student G	39	Cardiac Rehabilitation	N. Ontario	Yes (4 courses)	Positive
Student H	35	Community Health	N. Ontario	No	Several suggestions for improvement; need

Student	Age	Area of nursing practice	Geographic community	Previous online experience	General attitude toward this online course
					flexibility of online course
Student I	37	Medical-Surgical	N. Ontario	Yes (3 courses)	Positive
Student J	__	_____	N. Ontario	No	Positive
Student K	36	Case Manager	S. Ontario	No	Quality good; too much content; overwhelming at times
Student L	46	Psychiatry	N. Ontario	Yes (8 courses)	Very Positive
Student M	36	_____	_____	Yes (3 courses)	Negative
Student N	50	Emergency	S. Ontario	No	Positive

The following excerpts taken from the bulletin board reflect the complexity of the life of the post-RN nurse-learner.

Hello Fellow Nurses and a Happy New Year to Everyone:

My name is...and thanks to my good friend...(who is also taking this course), I have finally figured out how to work the WebCT Bulletin Board.

I am happily married and have 2 boys, 13 and 12, a dog and 2 budgies. This coming year is going to be both exciting and challenging, and I look forward to getting to know everybody. It is nice to go through this with the support of other fellow nurses as I have not been in School since 1982.

I got my nursing diploma from...in 1982. I started off my career working for an agency in...but it was mainly psych nursing and there were there were no full time jobs at that time so I applied everywhere in Canada and Europe. I got accepted at a hospital in Switzerland and had a great experience working on a med-surg floor and traveling across Europe. I came back to Canada and there still were no jobs, so I applied with the Army and the Government. The Government offered me a job in...and I was stationed there for 2 yrs as a med-surg-er-mat-ob-delivery nurse. I also did outpost nursing in the Northern Communities at that time, and that is where I met my husband who was flying bush planes throughout Northern Ontario.

We then moved from there to...for one year, where I worked on a med-surg floor and in the emergency dept. Due to my husband's job with the airlines, we had to relocate to...in 1989, and ever since, I have been working at.... I worked there full time in the ICU for 8 years and I have been in the Emergency Dept since 1997. Presently I work casual in the ER and PACU, and also work part time at.... In the past, I have had to put my career on hold and

work less hours to help balance home life, because my husband is an airline pilot and is away a lot. We have decided that now is a good time in our lives for me to go back to school and advance in my career as a nurse. I would like to focus more on leadership and management now, therefore looking forward to completing the Post-RN program to compliment all my other achievements and certifications.

These are exciting times for nursing, and it is time for us all to make a difference and to bring all our previous experiences forward to help the upcoming generation. I must admit I am a little nervous about going back to school, but with the support on line and of family and friends, I can do this.

Looking forward to this journey with all of you.

Regards,

Student N

******

Hello to all:

I wonder if I am the last person to introduce myself. My name is...and I have been an RN for over 17 years. My experience has been varied from rehab to step-down, adult surgical, ICU and now presently in the ER for 8 years. I have a casual position at...as the intravenous instructor.

Like most of you, trying to balance full-time work and family and now schooling is overwhelming. I am finding it difficult to get my nose to the grindstone even in the deep freeze that we are now experiencing.

I have two children 12 and 14 and tend to be a taxi driver for the most part.

Student D

Being geographically close to a university did not appear to be the only factor in choosing to study at that university. For example, several of the focus group participants live in southwestern Ontario. Despite the fact that they live in much closer physical proximity to other universities, these nurses have chosen Laurentian University in northeastern Ontario to take their studies. Repeatedly, the researcher heard that the flexibility of the Laurentian program was an important factor in choosing the program. In the words of Student B, Laurentian University's School of Nursing is "right on track with its commitment to students regardless of age, gender, and social class who cannot attend traditional classes." While choosing a university is a complex decision, it would appear that flexibility in the delivery of courses and programs is a significant consideration of the post-RN nurse-learner.

What special challenges did you experience because this was an online course? Three challenges were repeatedly cited by the participants. The first included navigating an online course with no previous experience. The second was starting the course late; the third was keeping up with postings and other online activity.

Six participants reported that they had no previous experience with online education (E, F, H, J, K, N). According to Students F and K, this caused them to feel overwhelmed especially at the beginning of the course. Another comment shared by participants about navigation was that they were not always sure where to find and post materials, "I put my responses to the unit one topics in the main section. Sorry" (Student E). These ideas are further suggested in the following passages.

Hi...

I wasn't quite sure where to post this message. Several other individuals in my group under...have not yet received feedback for our objectives. A few of us have had to cancel visits because of not receiving any comments from.... She posted that only after she provided feedback, would we be able to proceed to our visit

Could you please confirm that our email is working with ....?

Thank you.

Student H

*****

I apologize. I think being new in this system, I got confused with the email. I was posting on the bulletin board under...name. Because her name is listed on the bulletin board, I assumed that this is where we would correspond. Looking back at previous postings on the bulletin board...clearly requested that we email her from the email section.

Sorry for the confusion.

Student H

About starting the course late, the students suggested two general reasons for this: the first being personal ("My daughter and I have just returned from Cuba which is why I am late.... I am a single mother of a wonderful little girl that will turn eight tomorrow," Student M); the second relating to the university's tardiness in getting information about the course to them. In one case, the student reported that she did not realize that the course was an online course until two weeks after the course had started (Student F).

> Well, I am another one of those signing in late. This is my first course online and I didn't realize until tonight that it was mandatory to go online. I was really overwhelmed with this course, didn't know which direction to go in! Thanks for calling me and helping me out! I am really nervous about this course, especially with this late start!
> Student F

Keeping up with postings was cited as a problem by several participants and reflected by the reduced number of postings as the course progressed. In all three sections of the course, the bulletin board forums where students posted answers to optional (ungraded) learning activities became progressively less active as the course unfolded. Table 22 shows how the postings for Instructor A's section dropped from 72 (32.0% of total optional postings) in Unit 1 to 12 (5.3% of total optional postings) in Unit 5. Similar patterns occurred in the course sections moderated by Instructors B and C as postings dropped from 37.6% to 6.7% and 29.8% to 2.1% respectively.

All focus group participants said they were able to meet the challenges of online learning although one student expressed strong displeasure with the course. In addition to identifying her need to study within a face-to-face class context where she would be "able to put faces to names," she felt that the online nature of the course meant "too much information at once" (Student M). Because she had started late, she "didn't want to post." She found the posting to be "tough and tedious with too much analysis of one moment." As a result, she said she decided to simply "pop out a pass [standing for the course]."

Table 22

Postings in Units 1 to 5

Unit number	Instructor A *n*=225	Instructor B *n*=178	Instructor C *n*=94
Unit 1	72 (32.0%)	67 (37.6%)	28 (29.8%)
Unit 2	73 (32.4%)	53 (29.8%)	25 (26.6%)
Unit 3	29 (12.9%)	31 (17.4%)	16 (17.0%)
Unit 4	39 (17.4%)	15 (8.5%)	23 (24.5%)
Unit 5	12 (5.3%)	12 (6.7%)	2 (2.1%)

Has the course increased your dispositions towards critical thinking? All participants including Student M reported that the course had favourably impacted their critical thinking dispositions. Examples of student responses to this question are presented below.

> I strongly believe that this type of course is an excellent format for critical thinking. I was initially intimidated, but soon realized that the course and the online aspect of the course was clear, easily accessible and provided excellent links to interesting sites.
>
> Student B
>
> *****
>
> I think that this course was set up to enhance the learner's dispositions toward critical thinking. The readings were extremely effective in doing so.
>
> Student D
>
> *****
>
> I think the bulletin board is an excellent tool. This is my first online course, so I don't have much of a basis to go on. I did appreciate, however, the questioning of my views by the professor on the bulletin board. It only happened the one time, but it forced me to defend my position while acknowledging another's.
>
> Student J

The participants offered recommendations for how the course might be adapted to further enhance critical thinking. Student A commented that "problem-based learning involving the application of different principles or models to a practical (often real life) setting is an important learning tool for me." Student C suggested that "assignment content might include case studies which require a lot of personal opinions, past experiences, etc." while Student H described the importance of "more open discussion and finding a way of 'sharing' that is not direct copying of

the work of others...the number of students could also be lower to facilitate more open dialogue with each one."

In summary, the majority of the nurses prefaced their comments about critical thinking by pointing out that they practise critical thinking in the clinical setting—"As an ET nurse, I am always thinking critically (Student B); "Nurses are always thinking critically" (Student D). Seven of them went on to add that the course had been an excellent reminder of the role of critical thinking in practice; for example, two students stated that the course renewed their awareness that critical thinking is a "touchstone" in clinical practice (Students A, B). According to Student A, critical thinking is how "we grow as learners" and "critical thinkers are not easily swayed." Student C talked about the course content with its emphasis on Johns' ways of thinking in nursing as "helpful in defining issues that nurses have long since struggled with...such as caring."

A self-reported example of possible impact on a student's critical thinking dispositions was suggested by Student A. Student A talked about the fact that when she started the course she found herself asking "why am I doing this?" Describing herself as a nurse who was "struggling at bedside after a very trying year," she "did not know if [she] wanted to carry on with [her degree]" at the beginning of the course. As the course unfolded, she found her "confidence returning through the reflective thinking activities of the course," the theme of caring which "struck a chord," and the instructor's "ability to connect [which] came across the wire." In the following passage, Student A describes the impact of the course and its focus on reflection on her in detail.

> I just wanted to share with you my news. I have accepted a new position as a Clinical Leader.... This has been a huge decision for me as I have been in the NICU environment for

26 years. People have been encouraging me to pursue leadership roles for some time, my confidence causing me reluctance. This Jan. a temporary role for CL came available for the NICU.... Between the 2 exams I was writing, Chem and Women's Health, I did poorly on the interview and was not successful. I had previously done the role and had received great reviews.... To say the least, I started this course feeling wounded.... Caring was such a touchy subject for me.... I was not feeling cared for... I had given so much to that unit.

The reflection piece of this course helped me make the decision to pursue other leadership opportunities and not let fear paralyze me. As I examined my clinical experiences, I realized I could support nurses by providing a quality practice environment, I had returned to school to grow... [My teacher's] teaching style of personally acknowledging everyone's contributions has been a great morale booster for me...did a lot to help me recover from my disappointment and helped me feel able to pursue this other job interview. The sharing and postings helped me to realize the diversity in nursing, to realize that the central issues stay the same. Just as I felt me energy drain with disappointment, I felt it returning as excitement builds as I look to this new adventure.

"Creativity in caring cannot be something that is taught, but it certainly can be facilitated" (Richards, 2002, p. 32). An important question for me as I reflected on my 29 year practice was whether or not the current climate or professional practice encourages creativity to thrive, encouraging nurses to feel enabled to respond to need in ways that transcend the mechanics of routine care (Richards, 2002). As I enter this new career phase into management, I can only leave behind my clinical practice believing I can support nurses in developing quality practice environment, hoping they can experience the rewards I have had over the years. I will remember this course as part of a turning point in my life and have

to believe in a power that places tools where they are needed. Everything happens for a reason.

Has the bulletin board supported your learning? Because of the study's focus on the role of writing in an asynchronous discussion forum, the students were asked about the use of the bulletin board in supporting learning. The students' responses reflected mixed opinions.

Before sharing these opinions, it is important to remind the reader that although all students were enrolled in the same course, there were three sections of the course with bulletin boards organized and moderated by three teachers. Although each board included forums for assignments and the learning activities of each unit, beyond this, the look and feel of each board was unique. Figure 4 shows the different organizational systems used by two instructors. In the

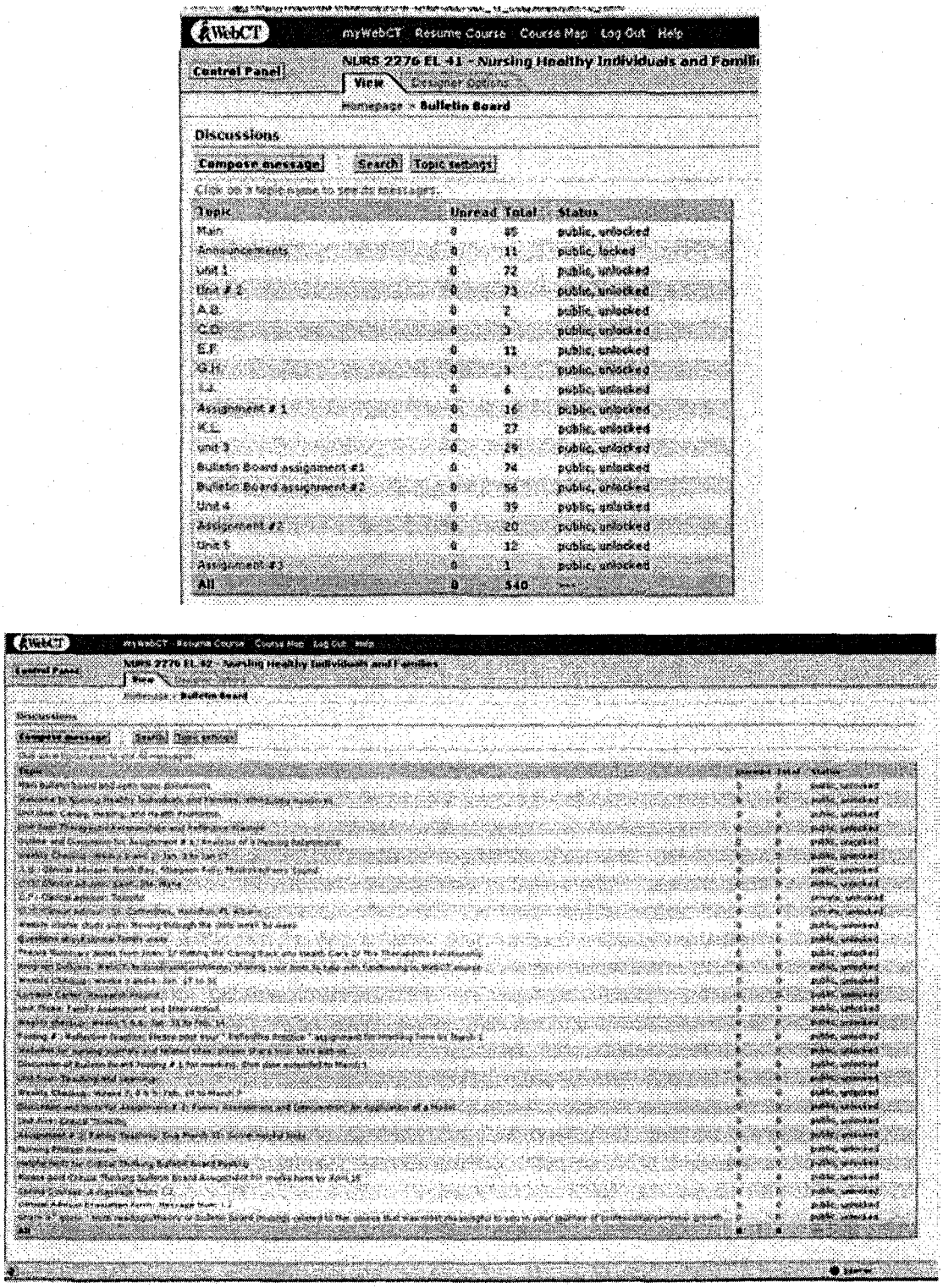

Figure 4. Two Different Interfaces for Bulletin Board Work Used in Course Taken by Experimental Group.

first, there are 18 forums grouped in subsets. In the second, there are 32 forums that do not follow an apparent system of organization.

Four students spoke very positively about the bulletin board. Student L, a student in the course section with the less cluttered bulletin board (see Figure 4), indicated that she found posting to be a "liberating experience," explaining that the anonymity of the board prevents a person from becoming too emotional, "I like the fact that in this course we could use personal stories. I wanted to tell a story about my father. I could not have done this live without becoming teary." A second student who said she read most of the postings stated that she might have been intimidated expressing her views in a classroom. She was not intimidated on the bulletin board, "There was so much experience in our group that I would have been intimidated in a classroom" (Student G). While Student A expressed positive views about the bulletin board, she noted that the posting experience can be "wounding" and that learners need to be prepared to take "risks." A fourth participant (Student C) stated that the communication tools of this WebCT-based course made the course a "much better experience than the old print courses."

Three main concerns were expressed regarding the bulletin board. The first complaint—recounted by (Students A, B, E, F, K)—was that, except for the "required" or "for marks" posting situations in which all students participated, posting was carried out by a small core group of students. Student B commented, "I'm not sure how to fix the problem of one person always answering the questions before everybody else. This isn't a rude thing. For me, there just seems no impetus to respond to an activity that somebody else has already answered all the questions for. I don't mind responding to the response, but not to reiterate what someone else has said." About this same idea, Student L offered the following remarks:

> Students need to provide more feedback to each other—I have posted many comments and have never received any feedback from other students. This present professor has been excellent in that she responds to all comments posted. This is my last course prior to graduation so I have much experience with WebCT—and this professor has been outstanding with how she has responded to all our postings. It is interesting to note that the course I took in..., the feedback from other students was outstanding. Everyone would respond back and give some ideas about things that were written. Is it the type of student taking the course, the workload of the course...that helps determine the amount of feedback that you receive? These are all interesting questions??? In regards to critical thinking...when I posted and ask for other students' feedback...it is this feedback that encourages my critical thinking and opens up my world views....

Two students (Students L, M) commented that the board was ineffectively organized; as stated earlier, each teacher organized her own board and there was no standardized organizational framework across the three sections. In the case of Student L, her bulletin board was the cluttered board presented in Figure 4. In the opinion of Student M, her board was "weak and poorly organized"; she "would have preferred a board that moved on more quickly."

Six students (B, D, E, F, K, M) pointed out that the bulletin board included too much to absorb and that they went to the board only to deposit their required ("for marks") postings and/or when they had a problem they could not solve alone. In the opinion of these students, the bulletin board was more of a place to go to drop off assignments and resolve problems than a place to experience learning. Of the six students who expressed this idea, four of them had no previous experience with online education; these same six students spoke about not having enough time and feeling overwhelmed especially near the beginning of the course. This feeling

of being overwhelmed did not appear to be tied to the organizational interface of the bulletin board as each of these students was enrolled in the section with the less cluttered board (Figure 4). One student commented, "We need far less e-mails and reading from the bulletin board. I find it hard to keep track of it all that way and there has been well over 300 postings" (Student F).

Tell me about your experience of academic writing in the course. Two participants indicated that academic writing at university was a brand new experience for them (Students D, F). This situation occurred because the course included students at different points in the post-RN program. Student D went further to say that "this course was the first time I have ever written a formal paper. We didn't do any formal writing in college."

The other students expressed that they felt comfortable with the writing required in the course although there were concerns expressed about the APA style conventions expected in their graded postings. Students A and B commented on the inconsistency across the academic community in its demand for the use of these conventions, "I am frustrated that our teachers say they are marking our APA style but then they all seem to be using different guidelines" (Student A); "With APA being so daunting and the different expectations of instructors, a two-page style guide would be a good idea" (Student B). Student L remarked, "It is really frustrating when there is so much importance placed on it but we are not taught it. APA is a difficult skill to learn alone." While two students thought that they might have benefited from the services of Laurentian University's writing assistance program (Students D, B), it was also commented that such supports are valuable only if there is a quick turnaround time, "I don't have enough time in my schedule to wait one or two days for feedback" (Student B).

What changes would you recommend to online courses based on your experience in this course? Several participants (Students B, C, D, E, J, M) indicated that they would have benefited from either an Internet-based chat room where the instructor could hold office hours or from a

teleconference. Student B commented, "Definitely a chat room, maybe with the instructor in it for a given time for questions or concerns. It could also be a great way to interact with other learners. I don't feel this should be mandatory (because different people have different schedules and may not be able to chat a specific time) but certainly it should be an option." Two students recommended providing grades for general bulletin board participation (Student G, E), "By giving marks for participation, students would have to do critical thinking and maybe they would end up enjoying it" (Student G).

As noted in the students' responses to the question "Do You Think the Course Has Increased Your Dispositions Towards the Practice of Critical Thinking?", students had a number of suggestions regarding how the course might be modified to further enhance critical thinking. The recurring suggestions suggested more problem-based learning, case studies, opportunities to draw on personal clinical experiences, and more dialogue in contrast with straightforward answering of questions where there might be the inclination to repeat others' ideas.

About instructors. Although not formally queried about their instructors, four students from the same course section volunteered strongly positive comments about their instructor. Student A spoke about her teacher's "wonderful presence on the board." This same student continued to say that, while she found that assignments were slow to be returned by this teacher, she preferred the "caring feedback the teacher provided over a fast turnaround in marks" (Student A). Two other students in a second section spoke favourably about their teacher. No comments were offered by students about the third instructor. While the first instructor was commended for her extraordinary presence on the board in both qualitative and quantitative ways, the second instructor was recognized for the clarity and helpfulness of her messages.

Teacher Data: Interview and Bulletin Board Comments

Two of the three course instructors agreed to be interviewed. Each is a highly experienced part-time nursing instructor. Both instructors stated that, as part-time teachers, they may have more time to dedicate to an online course than a full-time faculty member might have.

Can you tell me a little about yourself as a nurse and a teacher? Instructor A, in addition to her background in nursing education, spoke about her Master of Education degree in adult education completed through distance education. As a graduate of Laurentian University's School of Nursing, Instructor B has over 15 years of nursing education experience at the community college and university levels.

How would you describe your students in this course? Both instructors spoke about the age and experience spread among their students from new graduates to highly experienced nurses. According to Instructor B, "the different levels of experience in nursing were very evident. Also for some students, this was their last course and this meant that they had covered some of the content before."

Instructor A worked with students principally from southwestern Ontario. A comment she offered about this group was that many of them had been referred to the Laurentian program through colleagues and peers who had taken the program previously. While Instructor B's students drew principally from northeastern Ontario, her group also included learners from the Greater Toronto Area (GTA) and Hamilton, "I had a number of students from Chinese and Russian backgrounds. They would call me regularly and were very concerned about the writing they had to do in the course." By comparison, the students from northern Ontario tended to be more technically savvy and to have more support networks than other students, "My students from North Bay, Sudbury, and Sault Ste. Marie were familiar with the 'distance ed' experience."

The exceptions were a student from a small northern community who had ongoing technical difficulties and another student who telephoned every week.

Do you think the course helped your students as critical thinkers? Critical thinking—while expected in all aspects of the course—was targeted in two "required" or "for marks" postings made by each student. Students were asked to complete these bulletins at the mid-point and towards the end of the course.

The first assignment asked the student to reflect on a clinical practice event from the student's work experience. In the second assignment, the students were provided with a clinical case and asked to analyze the case. The headings used in this assignment were actual data, data needed, provisional diagnosis, learning issues, and critical thinking. The two assignments were called Posting #1 and Posting #2 (Appendix C).

Regarding the first assignment, Instructor A commented, "My students just didn't get it." While the reflection and thinking components of the assignment "resonated with some," Instructor A felt that the description of the assignment was "too wordy and perhaps too difficult." According to Instructor A, this led to "situations where there was straightforward repeating of information....They simply fed back information and did little reflecting on their personal experiences." Instructor B stated that, in her opinion, the students had done good work. She had posted hints about how to approach the assignment and felt that the use of a real personal experience in nursing was a strong point of the assignment. She added that the "bulletin board postings that demonstrated the greatest critical thinking were those in which students spoke about their own lived experiences and showed valuing of their clinical experiences. This happened not so much in the assignments but when, every once in a while, someone raised a clinical issue out of the blue. Near the end of the course, someone started a new thread about something going on at work. The dialogue that happened in that thread was very rich."

About the second assignment, both instructors felt that students had performed satisfactorily. However, Instructor A commented that, since this assignment was due near the end of the course, students did not have enough time to do reflection and critical thinking in a meaningful way, "In the overall, there were too many assignments and the assignments need to be re-worked. It was extreme for everyone." Instructor B agreed that "the students were too busy. They really had no time for reflection. We have to remember that these students have lives."

Do you think you saw a connection between critical thinking and writing in the course?

Asked if they perceived a positive connection between writing and enhanced critical thinking, both instructors were reluctant to support this view. Instructor A commented, "I can't really say. Some of them are comfortable with writing. Others prefer reading over writing." Instructor B added, "I had some very strong participants who contributed regularly and acted as role models for the others but I also had some outstanding work from students who were hardly ever on line." Instructor B mentioned one student who had many technical problems and accessed the bulletin board only occasionally yet her work was exceptional.

Tell me about academic writing in the course. Instructor B spoke about the writing needs of a group of her students who were from the Toronto area and who contended with situations of English as a second language, "My students from the Toronto area called a lot. They were very concerned about the writing required in the course." Although these students required much support, all of them successfully completed their work and experienced "great growth as writers" (Instructor B).

Regarding the students' expertise with the discipline-specific writing conventions (APA), both instructors indicated that the students' skill in this area depended largely on where they were in the post-RN program, "Students new to the program had much more to learn than those

near the end of the program. If this was the last course for a student, APA was old hat. In all, students did improve a lot" (Instructor B).

Instructor A called herself a "stickler" for APA who encourages her students to rely on the APA manual, "I tell them to get the manual and to flag it. I really push my students. Some of them really take this on." Instructor B commented, "I don't take marks off. I do encourage them to keep at it. I also give them samples. I don't find the manual to be very helpful."

Both instructors commented that some students demonstrated growth in their expertise of evidence-based writing. These students progressed from "I believe" type statements to statements supported by relevant references to the nursing literature, "The students who demonstrated evidence-based writing were the graduating participants. They had met some of the content before and had learned APA over the program" (Instructor B).

How do you see the instructor's role in moderating the bulletin board? Asked to describe the instructor's role in moderating the bulletin board, each spoke about the challenge of "how to create dialogue" (Instructors A, B). At the same time, they presented somewhat contrary positions regarding how they approach this task.

Instructor A spoke of making a conscious decision not to participate on the board regularly. Instead, she read everything and stepped in only when asked or if there was a problem requiring her expertise. She did, however, summarize comments shared on the board at the end each week and at other key points in the course. In the following excerpt, Instructor A describes her approach to the bulletin board to her students:

> Hello everyone:
>
> We are moving along and some of you have organized your visits. Excellent! You'll notice that I don't make many comments on the bulletin board. Your thoughts and

> comments are the true meat of the discussion and provide the varied perspectives that make the course interesting and thought provoking. I try to put out questions that I hope will facilitate the critical reflection that takes us to a deeper understanding of our motives and values. I do read each posting. The more postings the better the dialogue but realistically you can be selective about the questions you answer. I have posted under assignment one a few helpful hints. Make sure you read it.

Instructor B described herself as a participant, "This was the only course I was facilitating. I very much enjoyed it. I saw myself as a participant." This excerpt taken from Instructor B's very first posting on the board emphasizes this idea, "The greatest gift of teaching is the opportunity to meet and study with such a dynamic and caring group of people like yourselves." Near the end of the course, Instructor B posted the following statement:

> It has been a privilege to have the chance to study with you over the past few months. It has been a very enriching experience sharing your wealth of experiential knowledge and outstanding insight into the concepts of caring, healing, health promotion, the therapeutic relationship, reflective practice, the family, teaching/learning and critical thinking and the nursing process. You are all outstanding role models for the utmost level of care and have truly shown me the path to the aesthetic way of knowing in nursing.

While the instructors saw their roles differently, both offered their students many notes of clarification and encouragement as well as resources and samples.

Clarification

Based on some of your questions about assignment #1, the course professors have put together some ideas that we hope will clarify any questions you have.

It is attached as a word file.

Instructor A

*****

The bulletin board postings are submitted for marking. These are described on page 5 of the assignment file. Any other bulletin board postings that you make are not marked. They are intended to promote sharing of ideas, insights, and resources as you work through the units in the book. Every unit has questions that are asked to be answered but they are not marked. The only bulletin board postings that are marked are the ones on page 5 in the assignment file:

Posting #1: Reflective Practice

Posting #2: Critical Thinking

Hope this makes it a bit clearer. I will be here today so please call if I can be of further help.

Take care.

Instructor B

Encouragement

Hello Everyone:

The marks are posted. I will hopefully mark all the bulletin board postings in the next few days...and then it is a wrap. You have done amazing things and I have learned a lot from your submissions.

Instructor A

*****

Hi Everyone:

Your interactions and reflections on the bulletin board illustrate that you are a gifted group of nurses!! It is a privilege to have the chance to study with you. As we move to the end of the third week of the course, it is helpful to examine our progress and make plans to move forward into our theoretical applications and professional growth.

Unit Two provides a vital link...

Instructor B

*****

Thank you for sharing this very touching reflection that speaks volumes to the potential for a high level of human connectedness in the therapeutic relationship. You have demonstrated an outstanding sensitivity to the needs of this family, your empathy was accompanied by warmth and genuineness and your true caring and concern for what the client/family was experiencing shone.... Thanks so much for sharing this reflection. This woman was very fortunate to have you as her husband's nurse. You have touched her life forever.

Instructor B

Resources and Samples

For some of you accessing articles online may be a new experience. In order to find the article we discussed in the first helpful hints, we have put together a few more tips.

See attached.

Instructor A

*****

Hi Everyone

I hope you are all well. I met with your teachers from the other two sections of NURS 2276 and we developed some helpful hints for this assignment. We will work toward a more thorough application of the Ways of Knowing in the Bulletin Board Posting assignment. Please let me know if you have any more questions. Take care.

Helpful Hints for Assignment #1

1. Plan time accordingly, the assignment is due....

Instructor B

What changes would you make to increase bulletin board participation? Asked about changes they would make to increase participation on the bulletin board, both instructors suggested that providing a participation grade might be a way to increase participation. Each instructor stated that she would consider doing this in subsequent offerings of the course. Instructor B volunteered her recollection of an online course in which she had been a student and 15% of students' final standing was based on participation, "In this course, there was less to read and there was group work. Each group had a position paper and three questions to explore. The questions really got me engaged." Instructor A volunteered that she had taught an online *course*

with a nursing issues focus and that, in her opinion, this kind of content generated robust discussion.

How else did you interact with your students besides the bulletin board? Both instructors suggested that the course included much teacher-to-student interaction that went unseen; Instructor B said, "I did lots of telephone work. I probably talked to 30% of my students over the course."

In many cases, the phone calls were an important means of providing reassurance. Instructor A talked about checking on her students' "emotional state." It was also suggested that some students benefited from these calls because they are auditory learners, "Just as there are individual learning styles in the classroom, the same applies in online learning" (Instructor A).

Instructor A volunteered that, during the online course that she had taught previously (noted at What Changes Would You Make to Increase Bulletin Board Participation?), she had received very few phone calls, "I had hardly any calls in the Issues and Directions course I taught last spring." Her explanation of this was that this course had included a weekly work plan, "All students benefit from work plans. I would recommend them in all courses."

Asked whether or not teleconferencing might be an appropriate addition to the course, Instructor B said, "Any support network that fosters a sense of community and sharing about the course would be a valuable addition to the course." Instructor A recommended reducing the course load in contrast with the idea of adding required teleconferences, "If we reduce the number of assignments and re-work them a little, I don't think teleconferences would be necessary. They are so hard to organize and that the nurses don't need one more thing they 'have to do.'"

Asked about the option of synchronous chat, the instructors stated that this might be a way for students to connect with each other and establish informal support networks, "Chats

might help students connect with each other but I would not want to see them be a course requirement" (Instructor A).

Summary

The coding for Johns' (1995) ways of thinking led to an appreciation of the relationship between the design of writing assignments and the kinds of thinking that students will typically demonstrate. Because of the role that writing plays in online education, this area merits serious study.

Although the students reported a variety of reasons for taking a post-RN degree program, all spoke about the need for nurses to pursue additional education. It is suggested that this may be an outcome of the changes presently occurring in healthcare as well as the baccalaureate-to-practice requirement. As for why the nurses chose to study at Laurentian, in many instances, the flexibility of online learning was cited as a variable (Appendix K).

Navigating an online course with limited experience, starting the course late, and keeping up with postings were cited by the participants as their main problems. While the nurses had no quantitative measure of whether or not the course had positively impacted their disposition towards critical thinking at the time of the focus group sessions, they all reported that the course had done so. Regarding the role of the bulletin board in enhancing their learning, students' responses were mixed; some spoke very positively while others did not comment. Organization of the board was described to be problematic by some of the participants.

Their experiences of academic writing were similarly mixed with serious concerns expressed by those who were new to writing in nursing at university. Students varied in their opinions about the emphasis on APA writing conventions in the course and how writing supports might be useful for them. As for suggestions for improving the course, the dominant suggestion was to include alternate ways for the nurses to connect such as a chat room or teleconference

might offer. Problem-based learning, case studies, and learning activities that draw on personal and clinical experience were recommended as ways of fostering critical thinking.

Although not asked about their instructors, there was a core group who spoke very warmly about one of the instructors. She was recognized for her extraordinary commitment to providing feedback and her interest in her students.

The instructors expressed enormous respect on the part of the teachers for their students and recognition of the complexity of their lives. The instructors further impressed the researcher with their extensive backgrounds as nursing and adult educators.

Some patterns seemed evident to the instructors based on geographical groupings of the students. In particular, northern learners were described as possibly more familiar and comfortable with distance education strategies than others. Some students in the Greater Toronto Area (GTA) came into the course with challenges related to language and, in turn, academic writing. These students worked extremely hard and made impressive gains over the duration of the course.

The instructors expressed different viewpoints about the quality of critical thinking that occurred in the first "for grades" bulletin board posting. Both felt that better critical thinking was demonstrated in the second bulletin board posting. Ambivalence was evident when they were asked if they perceived a connection between writing and enhanced critical thinking; it was suggested that reading may be just as important as writing in the enablement of critical thinking.

The instructors described somewhat different expectations regarding the use of APA conventions in the course, one offering a greater number of samples to her students and the other encouraging students to rely almost exclusively on the APA manual. The instructors further described contrary manners of moderating a bulletin board: in one instance, the instructor saw herself as a co-learner; in the other, the instructor saw the board as a place for her students to

exchange ideas with a limited personal presence by the teacher. As for ways to increase bulletin board participation, awarding grades and modifying certain components of the content and learning activities were recommended.

Finally, each instructor commented on the additional support and interacting with students they did outside of the WebCT course. Most notable were the number of personal calls each had with students. Teleconferences were recognized as a possible way by which students might feel more connected but were recognized as logistically complex to organize and often impractical for working nurses. Online chatting might be a way to reduce isolation but was not seen as valuable as a way of delivering course content.

Chapter VI

Discussion

The hypotheses explored in this study are the following:

1. online nursing courses that include asynchronous reflective writing activities enhance the learner's dispositions toward critical thinking,
2. online courses that include asynchronous reflective writing activities increase the learner's perception of competence as a writer, and
3. online courses that include asynchronous reflective writing activities facilitate demonstration of critical thinking skills through writing.

In this chapter, findings related to each hypothesis and relevant emerging findings and areas of interest are discussed. The study's contribution to constructivist learning theory will also be highlighted.

First Hypothesis: Dispositions Towards Critical Thinking

The study did not reveal statistically significant increases in the participants' measures of critical thinking dispositions as a function of online involvement. As a result, the first hypothesis is not supported.

For those who work as educators in fields where certain critical thinking dispositions are valued, this is important. The healthcare profession is one such discipline (Bartlett & Cox, 2000, 2002; Profetto-McGrath, 2003a, 2003b). Because this study reveals that critical thinking dispositions do not generally change according to age, life experience, and learning format, there is a need for research into the design and evaluation of learning activities and assignments as well as content presentation if cultivating critical thinking dispositions through education is a desired goal. This research would impact not only those interested in specific critical thinking dispositions but also those who maintain, that, without positive critical thinking dispositions in

general, critical thinking applications may be substandard (Profetto-McGrath, 2003a). It is further suggested that, although cultivation of critical thinking dispositions may not be an easy goal to achieve, this does not mean that it is not worth pursuing.

Another area for research involves the adaptation of assignments used in other learning contexts for the online setting. For example, as the number of online learning courses taken by students at Canadian universities continues to climb, educators need to better understand how assignments typically used in the face-to-face classroom require modification in order to maximize the potential of the web experience. On a similar note, the strengths and limitations of text-based assignments in web-based settings likewise require study.

A further outcome for educators based on the finding that dispositions tend to be resistant to change might be a greater focus on critical thinking skills in contrast with critical thinking dispositions. Although difficulty was encountered in measuring critical thinking as displayed in writing, there is a rich body of literature that supports the claim that critical thinking applications can be demonstrated in writing (Brown & Sorrell, 1993; Burrows, 1995; Garrison & Anderson, 2003; Ibarreta, 2004; Ironside, 2003; Kennison & Misselwitz, 2002; McLean, 2005; Sedlak, 1997); as well, as later discussion in this chapter suggests, it was found that that different kinds of thinking can be elicited through writing. In the case of online education, the decision to focus on critical thinking skills rather than critical thinking dispositions could require collaboration among the different members of the learning team. As suggested in the literature search for this project, at the present time, online education as delivered by most colleges and universities tends to be heavily text-based. Research needs to continue so that educators have a good understanding of which critical thinking skills can be fostered and demonstrated through writing as well as how to design written assignments that encourage development of specifically-identified critical thinking skills. Additionally, subject matter experts may want to explore with instructional

designers, educational technologists, and educational researchers alternate kinds of online learning experiences and their effectiveness in enhancing critical thinking skills. In other words, just as there is a need for further research into writing-based assignments for the online educational environment and how they may foster specific critical thinking skills, there is a need for research into the critical thinking potential of other web-based learning options including multimedia applications and web streaming. How multimedia-rich learning opportunities when they are blended with written assignments support development of critical thinking skills is another area for study.

An interesting observation related to assignment design was offered by a post-RN nurse in one of the interviews. This nurse suggested that more case studies might have been a way of encouraging critical thinking skills in the course. While some studies claim that critical thinking skill is not related to gender (Baxter-Magolda, 1992; Claytor, 1997), others have found a relationship between gender and critical thinking based on the idea that women have different ways of knowing than men (Belenky, Clinchy, Goldberger & Taurule, 1986; Miller, Finley & McKinley, 1990; Rudd et al., 2000; Walsh, 1996; Wilson, 1989). Therefore, in a learning setting where critical thinking skill is valued, the issue of gender may also need to be considered. For instance, it has been suggested that, because women are more culturally socialized to build and maintain relationships through co-operation, they tend to apply critical thinking in scenario- and case-based learning situations and activities that draw on personal and clinical experiences (Lundy et al., 2002). Extrapolating, in learning situations such as nursing education where the majority of participants are female, attention may need to be paid by content experts and learning designers to preparing these kinds of learning activities.

Additional observations made about the development of critical thinking skill in an online course were offered by the two instructors of the post-RN nurses in their interview. The

instructors commented on the idea that, in the course, both writing and reading in contrast with just writing might have contributed to any growth the students experienced in their critical thinking skills. They further commented on how personal learning style likely affects how an individual student responds to a learning activity designed to elicit critical thinking skill. As possible support for these ideas, one of the instructors described how a student who had made minimal contributions to the bulletin board did extremely well in the course. While the student had been able to read postings, she had had technical difficulties whenever she tried to make a posting. The suggestion was that this student's critical thinking skills were enhanced more through reading than through writing. While the researcher accepts that the student may have been learning effectively, her ideas were not being shared with others in the course. As a result, she would not have gained from her peers' critique of her ideas. Nor would she have contributed to the learning of her colleagues.

Considering all these ideas, the researcher has been challenged to consider whether it is the act of posting or the act of reading postings or some blend of the two that whets the critical thinking appetite in an online course where words are extremely important. At the same time, it is suggested that, in each scenario, writing is a pivotal element: the learner is either doing writing or interacting with the writing of others. Building on this idea, it is suggested that there is work to be done to understand which activity—reading or writing—and which blends of the two best support critical thinking skills when there is specialized subject matter and unique learning style considerations. While the researcher is primarily interested in writing as it occurs in the postsecondary educational setting, she would suggest that there has been excellent work done in this area by reading and writing experts who have focused on younger learners and that there may be valuable opportunities to build on this work (Atwell, 1998, 1991; Calkins, 1994; Graves, 1983, 1994).

While there is research happening in the area of learning styles and distance-based online education settings (James & Gardner, 1995; Neuhauser, 2002), it is recommended that there is a need for research into the relationship involving the online learning setting, learning styles, reading and writing, and critical thinking skills. Regarding reading and writing, there is evidence that the online reading experience is different from that which occurs in other learning settings; the ways by which writing can occur on line are numerous and, in several instances, have been identified as specific to the online milieu. The more that researchers can discover about these activities and their connections to critical thinking skills, the better able course designers and subject matter experts will be to offer learning experiences where critical thinking skills are utilized and possibly enhanced.

The finding that there was an increase in the truthseeking disposition corresponding with university experience across all three participant groups may be related to what some North American educational researchers are saying about twenty-first century university learners. Adult learners have long been classified as being approximately 25 or older and have been described as possessing unique characteristics (Knowles, 1978; Snow, 1977). There is growing evidence that the characteristics and motivations historically associated with adult learners apply to the majority of students pursuing twenty-first century higher education (Bash, 2003). According to Bash (2003), many younger university students are "exhibiting behaviours and characteristics previously attributed to their older classmates" (p. 39): these attributes include internal motivation, awareness of social role, use of life experience in learning, a sense of immediacy, problem-centeredness in learning, and self-direction (Knowles, 1980, 1984). If one accepts this idea that that postsecondary institutions are witnessing a "new 18- to 22-year old student" (Bash, 2003, p. 57) and the fact that more mid-career professionals are seeking postsecondary educational opportunities, it is not surprising that, in this study, truthseeking in comparison with

the other dispositions emerged as the CCTDI scale to show the greatest increase over time. The rationale suggested here is rooted in the principles and practices of andragogy.

Adult learners have typically been described in the literature as learners with high motivation and strong sense of purpose; they are learners who are often dedicated to discovering truth as it applies to their life circumstances. The definition of truthseeking as offered by Facione and Facione (2000) and as measured by the CCTDI is offered here:

The truthseeking scale (the T-Scale) targets the disposition of being eager to seek the truth, courageous about asking questions, and honest and objective about pursuing inquiry even if the findings do not support one's interests or preconceived opinions. The truth-seeker would rather pursue the truth than win the argument. This scale refines, focuses, and extends the Delphi characteristics "willingness to reconsider and revise one's views where honest reflection suggests that change is warranted," "reasonableness in selecting and applying criteria" and "flexibility in considering alternatives and opinions." (p. 2)

Additionally, if asynchronous bulletin boards are places where learners not only share ideas but also receive constructive feedback from peers and instructors that may assist in the refinement of issues and/or the generation of meaning, it seems reasonable that online learners—like their peers in face-to-face learning classrooms—would demonstrate increases in their truthseeking scores. It is also interesting that the truthseeking gains were reflected across all three groups in the study, perhaps suggesting that postsecondary learners regardless of discipline, age, and learning format are truthseekers. A further observation about the truthseeking scores is that, although truthseeking in the pre and postcontexts generated the lowest scores, it also witnessed the greatest gains. Therefore, if modern universities value truthseeking as a goal for their learners, this is a positive finding. Additionally, those who work in the adult education field

and with learners who carry additional family and work responsibilities may be take some assurance that these learners are also making progress in truthseeking.

As a critical thinking disposition, truthseeking—because it is regarded to be the basis of evidence-based practice—is of particular interest in the healthcare professions and, therefore, to those who educate health care professionals. For example, in doctoral work conducted by Profetto-McGrath (1998), it was discovered that a group of baccalaureate nurses at the University of Alberta scored highest on the critical thinking disposition of inquisitiveness and lowest on truthseeking as per the CCTDI. Based on this finding, Profetto-McGrath (1998) suggested that baccalaureate nurse-learners may not always critique the information they receive for its relative truth. Similarly, in research conducted with physiotherapy students, Bartlett and Cox (2000, 2002) from the University of Western Ontario reported that physiotherapy students scored highest on openmindedness and inquisitiveness, and lowest on truthseeking and critical thinking self-confidence. Based on these findings, the researchers suggested that the university's physiotherapy curriculum required review to determine if it emphasized one disposition over others. Given the quasi-experimental design of this study, it is suggested that contemporary university students including nursing education students of different ages who are studying in different ways do make gains in the truthseeking area. If this gain is not rapid or substantive enough based on the demands of the discipline, university educators may wish to complement this natural evolution over time with educational occasions that target development of this disposition.

In summary, although the hypothesis that online nursing courses that include asynchronous reflective writing activities enhance the learner's dispositions towards critical thinking cannot be supported by this study, it is suggested that important insights have been generated for instructors and those who work in course development units. It is also suggested

that the finding of sustained scores is more advantageous than had there been a decrease in the scores; for those who might question the impact of online courses on learners' attitudes, this finding suggests that the influence of the online educational experience on dispositions is comparable to that of other learning experiences. Stated another way, online learners are on par with their peers in terms of disposition development. Finally, exploration of this hypothesis has revealed a trend related to truthseeking among university students.

Second Hypothesis: Perception of Competence in Writing

The second hypothesis was that online courses that include asynchronous reflective writing activities increase the learner's perception of competence as a writer. Based on the self-report data gathered from the participants before and after the course, this hypothesis is supported. Improvement was reported by all participants with the most dramatic gain occurring among the participants in the experimental group composed of the more experienced nurse-learners. There was strong evidence that the course had mitigated the anxieties of these learners about writing and had increased their confidence as university-level writers.

By contrast, when the instructors were asked about the post-RN nurse-learners' development as writers, they reported no remarkable growth over the course. In light of this, it is recommended that the participants were either eager to report what they thought was the expected or socially desirable answer (Issac & Michael, 1997) or that they were experiencing an increase in personal confidence which might eventually lead to a measurable positive change. Based on the researcher's extensive experience as a writing instructor at Laurentian University and the literature related to self-efficacy and performance as found in the educational psychology and composition fields (Meier, McCarthy & Schmeck, 1984; Prajares, 1996; Schunk, 1991), it is suggested that increased personal confidence and belief in a positive change may precede demonstration of the change. In the case of this study, the course requirement to communicate

almost exclusively through writing and to complete a number of written learning activities and assignments, the culture of a supportive learning environment of other adult learners, and the support of caring instructors may have been the "right climate" for facilitating an increase in the learners' confidence as writers.

Other possible factors that might have influenced participants to report increased confidence as writers have been suggested in the literature regarding online courses. This literature describes both negative and positive aspects of writing in online courses (Bullen, 1998; Burt et al., 1994; Garrison & Anderson, 2003; Gunawardena, Lowe & Anderson, 1997; Hara et al., 2000; Kanuka & Anderson, 1998; McKenzie & Murphy, 2000). If the post-RN learners in this study had had an overall positive learning experience as indicated by the interview data, it seems reasonable to suggest that they might also report an increase in confidence in writing. Given this possibility, it is worthwhile to note some of the benefits frequently cited regarding text-based online courses: opportunities for equitable participation based on the non-linear and time-independent nature of discussion boards; more time to reflect and craft thoughtful messages than may occur in face-to-face settings; access to social supports and networks of other adult learners; and access to multiple perspectives and an audience that acts as a sounding board for ideas (Blanchette, 2001; Carter & Rukholm, 2002; Davis & Brewer, 1997; Garrison & Anderson, 2003; Harasim et al., 1995; Meyer, 2003).

Third Hypothesis: Demonstration of Critical Thinking Skills through Writing

The hypothesis that online courses that include asynchronous reflective writing activities facilitate demonstration of critical thinking skills through writing could neither be supported nor rejected based on the study. Despite the best efforts of the researcher and three other writing experts from Laurentian University to assess for demonstration of critical thinking through

writing via a holistic scoring activity (Facione & Facione, 1992), no conclusions could be drawn because of interrater reliability problems.

Although there are likely many reasons for the problems encountered with the scoring activity, two stand out: the first pertains to the challenges of measuring critical thinking skill; the second to the issue of assessing writing. As discussed earlier in the literature review for this study, assessment of critical thinking skills has been an area of longstanding debate among educators and assessment experts. For example, the context-based test is regarded by some to be the most appropriate measure of critical thinking skill (Norris & Ennis, 1989; Pascarella & Terenzini, 1991; Pendarvis, 1996). Unfortunately, a confounding variable with this kind of test is that the test taker's score is likely to be affected by prior knowledge of the discipline. In the case of nursing, the only way of validating that a nurse who takes a context-based test can apply critical thinking in practice would be to follow the nurse in the clinical setting; clearly this is an expensive and impractical way of validating the critical thinking of nurses. If, on the other hand, one maintains, as does this researcher, that writing has some "inherent...advantages over speech when engaged in critical discourse and reflection" and that writing can be both "a process and product of rigorous critical thinking" (Garrison & Anderson, 2003, p. 26), it is appropriate to want to assess for evidence of critical thinking in writing. However, as experienced in this study, this is no easy undertaking. Still, it is suggested that it is important for researchers and educators to continue to seek ways to identify critical thinking skills in text-based e-learning contexts.

The scoring of writing is likewise an area that has historically challenged writing instructors and those who teach in content areas where demonstration of acquired knowledge and skills relies heavily on writing (Barnet, Berman, Burto, Cain & Stubbs, 2000; Kirszner & Mandell, 2001; Schoonen, 2005; Troyka, 2004). The hypothesis of a possible connection between online reflective writing and critical thinking skills, therefore, brought together three

extremely complex areas: evaluation, critical thinking skills, and writing. Capturing the complexity of this situation, one of the scorers described her experience of rating the writing samples in the following passage:

> Thank you for inviting me to read these papers; it was a fascinating and challenging task. I hope the following comments may be helpful.
>
> I encountered a number of difficulties in completing this task. As an English teacher, it was difficult for me to separate good critical thinking and the ability to convey those thoughts in clear, effective English. Although language and thought are closely interrelated on second reading of some papers, I decided to change the evaluation from 3 to 4 or 2 to 3 because I felt that on the initial reading I had been negatively influenced by poor writing.
>
> In addition, I found that the very varied nature of the assignments made it difficult to apply the rubric consistently. For example, in the literature review assignment, there was little scope for students to express their own ideas or use their own experiences. Therefore, I awarded level 4 to those students who seemed to have been able to organize their material in ways that demonstrated interesting connections and who appeared to have most effectively synthesized the information obtained from a variety of sources.
>
> In contrast, the autobiographies relied so heavily on personal experience that another series of issues arose. In some cases, I evaluated work as level 3 because it seemed to lack the necessary depth of explanation, the analysis of alternative points of view and a judicious drawing of conclusions; however, I wonder whether in some cases the very personal nature of the material made this difficult. Perhaps older students are

more able to demonstrate these traits when contemplating their own adolescence from the relative safety of distance and the security gained from having overcome stressful and in some cases traumatic experiences.

The case studies presented their own challenges; students often claimed to have demonstrated certain critical thinking skills which I could find little evidence of in the scripts. In some cases, students appeared to be well versed in the requirements of critical thinking but less able to demonstrate their application of them. Further, my own ability to identify connections not made and questions not asked and alternative points of view in the autobiography and case study assignments may have influenced my grading.

I hope these reflections are useful. Thank you again for allowing me to participate in this process.

Two outcomes resulted from the scoring experience. The first was renewed respect by the researcher for the intricacies of assessment of critical thinking skill as demonstrated in writing. The researcher would like to suggest that, as Hara, Bonk, and Angeli (2000) point out, "there is a pressing need to consider the dynamics of online discussion and how it facilitates students' cognitive and metacognitive development" (p. 125); however, measurement of critical thinking skill is a complex task since there is no "generally accepted model to evaluate critical thinking" (McLean, 2005, p. 2). Hence, there is a certain dilemma: while it would be the researcher's recommendation to use only psychometrically-sound instruments in all future research work related to critical thinking, when the thinking is embedded in writing, there will always be some element of subjectivity.

The second outcome of the holistic scoring work was the decision to study the participants' writing in two additional ways—to study the writing samples for general writing competence by tracking writing errors and to examine them for themes related to ways of thinking based on Johns' (1995) ways of thinking framework. The findings related to each strategy are discussed in the following paragraphs.

The decision to analyze the writing samples for general writing competence revealed that the post-RN nurses' perceptions of increased writing confidence did not coincide with demonstrated strength in writing. As pointed out in Chapter IV, of all the writing samples, those by the post-RN nurses showed significant weakness in grammar relative to the two comparison groups, and significant weakness in vocabulary complexity relative to first comparison group composed of the younger nurse-learners. From the researcher's perspective, this was not difficult to understand: all of the undergraduate nursing students had experienced at least 2.5 years of university before the study. By contrast, for some of the post-RN nurses, this was their first university course. Additionally, unlike the majority of post-RN learners, the majority of comparison group participants had not experienced major interruptions in their academic writing experiences having recently progressed from high school to university. These points noted, the post-RN nurses had more life and clinical experiences to draw on in their writing.

Based on the finding of weakness in the written work of the post-RN nurses, it is the recommendation of the researcher that universities develop special measures to provide older adult learners such as the post-RN group represents with supports and resources to enhance their writing. Anticipating that the post-RN nurses would welcome the idea of writing supports, the researcher discussed this idea with the nurses. Although the nurses saw value in writing supports, they were strongly vocal that such supports would have to accommodate their lives. For

example, if a writing support program was offered by the university but required advanced planning in order to access it, the nurses would likely not use it.

In the case of Laurentian University, it offers a Writing Assistance Program that all Laurentian University students are encouraged to utilize. There is no cost to participate in the program. The program offers limited services in the evening and no weekend services. The program will receive written work from distance learners as emailed attachments and faxes and return the submissions with commentary in one to two days. Several participants commented that, because of the turnaround time involved in accessing Laurentian's Writing Assistance Program, they did not use it. As the Laurentian program presently stands then, it is not adequately serving the writing needs of this student population, and the University may wish to consider making modifications to the hours and format of the program. A second recommendation is that resources and services and, in particular, writing supports be integrated as much as possible into the online course experience itself.

The final way by which the writing samples were analyzed involved coding for evidence of Johns' (1995) four ways of thinking: empirical, aesthetic, personal, and ethical. Although the findings are based on a small sample, it is suggested that a connection was demonstrated between the kinds of thinking by students and assignment design. Thus, if cultivation of different kinds of thinking is an important learning objective, activities and assignments require specific developmental attention; additionally, in online courses where written communication is the primary learning tool, course designers and content experts need to build on the strengths and limitations of written assignments as they can occur in an online educational milieu.

This last recommendation leads to a further finding based on the study—albeit a finding not directly related to the study hypotheses: that is how, in online education, the instructor plays a triple role. The first is that of learning designer. Sometimes the faculty member will be

supported by a team of experts who assist in the planning and execution of an online course; in other instances, the faculty member is responsible for the entire course experience. Either way, the online instructor will need to utilize principles from one or all of the major schools of instructional design and in the tradition of their champions—systems (Dick & Carey, 1996; Tripp & Bichelmeyer, 1990), time (Berliner, 1979; Bloom, 1976), task (Bruner, 1966; Gagne, 1987), learner (Knowles, 1978; Snow, 1977). Ideally, the instructor will make choices that enable an effective constructivist-based learning experience.

The second role the instructor plays is that of teacher. While this is a self-evident statement of fact, the role of teacher in the online educational setting is one that may not be fully understood; yet, according to the participants in this study, the teacher plays a pivotal role that students appreciate a great deal. For instance, the gratitude that several students expressed for their instructors during prompted the researcher to reflect seriously on the role of instructors in online courses. Compared to the tasks typically performed in a face-to face classroom, the tasks that an effective online instructor performs may not be as clear cut. As Easton (2003) notes, "the role of the online distance learning (ODL) instructor is ambiguous and often ill defined" (p. 95). Consider, for example, how, in the presurvey the post-RN nurses indicated greatest comfort with e-mail as a communication tool. Does this mean that an instructor should choose to use e-mail over bulletin board as a primary communication and learning tool? Both instructors spoke about the time they spent on the telephone with their students. Because students prefer one technology over another, does this mean that this technology should be the principal technology used in the learning experience? If a faculty member does a great deal of private e-mail and telephone work with students, there are workload implications to consider and loss of interaction with other students. If Biggs' (1996) observation is right that "good dialogue elicits those activities that shape, elaborate and deepen understanding," then failure to provide students with this kind of

dialogue represents a shortcoming in the learning experience; however, as this study has also pointed out, the online instructor working with older adult learners will, in all likelihood, face a variety of problems that may incline the instructor to deviate from the course framework and specified technologies from time to time.

Furthermore, when an instructor places emphasis on the shared space of the bulletin board, there are other variables to consider since, in this context, the instructor is a facilitator of discourse. In the case of this study, one instructor's commitment to be a co-learner who also provided content expertise, encouragement, learning supports, and discourse facilitation was enthusiastically recognized by her students. Still, the time and effort this kind of involvement requires are substantive. How much instructor presence on a bulletin board is enough is not an easy question to answer. For example, in general, do more postings by the instructor suggest a more effective teacher and better learning on the part of students? In the case of this study, the students of the most active instructor—most active as defined by the number of postings made—felt extremely positively about her. Her students expressed appreciation for her many practical tips and messages of encouragement. By contrast, there was ambivalence about the instructor who was least present on the board. These points noted, is robust instructor presence in an online course integral to the achievement of course goals and objectives? It is suggested that this is an area that requires further investigation so that the learning experience is effective for students and manageable for teachers. Although there is good theoretical work happening in this area (Anderson, Rourke, Garrison & Archer, 2001; Anderson, Varnhagen & Campbell, 1998; Paulson, 1995), there is more to do to assist faculty on the practical front.

The Study and Constructivist Learning Theory

As Chapter I outlines, the principles of constructivist learning theory are

distinct from those of behaviourism and cognitivism. While the former tend to be objective in nature, constructivism, on the other hand, promotes "a more open-ended learning experience where the methods and results of learning are not easily measured and may not be the same for each learner" (Mergel, 1998, pp. 20-21). As a result, designing instruction in a constructivist milieu is at best a complex undertaking. This dilemma as well as two additional ones—the first related to distance-based online settings and the second to situations where there is specialized curriculum such as occurs in nursing education—were central in this study.

Based on the researcher's observations throughout the study, the comments shared by the post-RN participants and instructors in the interviews, and their contributions to bulletin boards, this study suggests that additional elements may need to be considered relative to constructivist learning theory when the learners are at genuine physical distance from each other and their instructor; this was the case for the post-RN nurses in this study. It is recommended that, when physical distance is part of the experience, the selected constructivist design model that drives the learning experience—for example, Jonassen (1991a, 1991b) or Wilson (1997)—may require incorporation of components from instructional theories that are systems-, time, -task, and learner-oriented as well as elements from transmissive and experiential learning theories. In other words, from a theory perspective, the constructivist learning theory can include facets of different instructional design theories and different learning theories.

Consider how in the case of the post-RN nurses care was taken by the Laurentian School of Nursing and Centre for Continuing Education to deliver a course that encouraged constructivist learning while it also provided an organized, task-based educational experience. This approach was respectful of the additional learning that distance-based online education exacts from a newcomer to the online learning setting. Because this learner has no face-to-face opportunities to clarify concepts, ask questions, and so forth, it can be extremely challenging to

be enrolled in an online course that lacks a degree of systematicity. Similarly, although andragogy suggests that, adult learners require opportunities to create meaning based on their personal and professional lives and, therefore, may be especially receptive to constructivist learning, the administrators and staff who work with adult learners speak loudly about their need to experience clarity and straightforwardedness in their courses and programs (Bash, 2003). As a result, incorporation of elements from schools of instructional design that may appear to be at odds with constructivist learning into the design of a constructive-based learning experience is recommended. As noted, this circumstance is very important when the educational experience includes the elements of geographical distance, the Internet, and older learners.

Another possible addition to constructivist learning theory emerging from the study is the idea that teachers and designers should not feel compelled to exclude learning activities and assignments that are transmissive or experiential in nature in a course that builds on a constructivist framework. Rather, consider how there may be an instance in designing a course when a lecture is the most appropriate way to present certain curriculum. Because lectures are typically associated with transmissive learning, should this prompt the teacher to exclude them? In fact, this researcher would recommend that teachers and designers always reflect on whether or not a specific learning strategy is likely to contribute to construction of knowledge. If he or she believes that the strategy will, then the strategy should be included regardless of the theory body from which it derives.

The study has also argued that constructivist learning theory can hold a valid place in subject areas where there is specialty content—for example, nursing education. This stated, not all facets of nursing education are well suited for constructivist learning. In other words, the decision to use one learning theory over another in nursing education depends on the specific curriculum to be covered as well as the learner group itself. In this study, there was a natural fit

between curriculum that examined topics such as critical thinking and reflection in the context of nursing health individuals and families and constructivist learning. The appropriateness of this fit was strengthened by the circumstance that the post-RN nurse-learners were already nurses in contrast with being undergraduate nurse-learners. It is possible that the post-RN nurses may have been more receptive to a constructivist learning setting since adult learners have been noted to value making connections as form of learning.

Given the above discussion, the study has recommended several ideas for possible incorporation within constructivist learning theory. In particular, these contributions pertain to the implementation of constructivist learning theory in a specific learning setting—a distance-based online setting wherein there are older learners studying a particular kind of content—and the relationship that needs to remain open and fluid between different learning theories and instructional models.

Limitations of the Study

The first and most outstanding limitation of the study is its small sample size. Based on this, it is not possible to generalize findings to all post-RN Ontario nurses taking online courses. The study does provide a picture of the culture of critical thinking—including dispositions and skills—in the context of an online course taken by a cohort of post-RN nurses studying at a mid-sized northern Ontario university.

Regarding the issue of sample size, while every researcher desires an adequate sample size, in this study there was a conscious decision to work strictly with participants in online courses developed and offered by the same institution, namely, Laurentian University. As described earlier in this document, for an educational research study, there are confounding differences between institutions and their approaches to online learning (Ko & Rossen, 2004): for example, many institutions use the commercially available WebCT platform; others

Desire2Learn, BlackBoard, Angel, and so forth; still others use institutionally-developed software programs and open source applications. Likewise, the term "online learning" is used broadly and can refer to courses that are fully and partially Internet-based and to courses that include a variety of web-based multimedia components. A further variable when one thinks about online education at different universities pertains to instructional design and course development processes. The fact that this project focused on students from Laurentian University somewhat addressed these areas of variability.

Noted too as a limitation are the comparison groups. In order to achieve a more accurate picture of the Ontario post-RN nurse as a learner and critical thinker, more closely matched comparison groups are recommended. Such matching might have occurred had the researcher used comparison groups from other post-RN programs at other Ontario universities.

Other limitations of the study pertain to the data collection methods, the four-point writing rubric, and the professional experiences of the researcher herself. These factors will be discussed in turn. Each was a contributing and limiting factor in the study.

Regarding the use of surveys, it is important to recognize the limitations of surveys: they do not, for example, provide the researcher an opportunity to ask additional follow-up questions. The researcher is unable to seek clarification, and participants are typically unable to share insights beyond what the survey items address. Non-responses are a further limitation of survey strategies (Gray & Guppy, 1994).

A further possible criticism might relate to the researcher's choice to use the CCTDI in contrast with some other standardized measure. The CCTDI is a tool that considers critical thinking dispositions in general in contrast with critical thinking dispositions within the specific scope of nursing. Although this concern is respectfully acknowledged, the study was foremost about online learners who are registered nurses and require strong critical thinking dispositions

and skills in contrast with being a study dedicated exclusively to nurse-learners as critical thinkers.

Returning to the idea of participation rate, the participation of the post-RN nurses in the interviews was strong (41.2%). Still, there is the possibility that the supporters of online learning would have been inclined to participate over other nurse-learners.

Because the interview sessions were not audiotaped, it was not always possible to capture extended statements made by the participants. Still, the researcher maintains that all quotations are accurate. Therefore, while all quotations used in Chapter V are presented verbatim, those included from the interviews are not as long as those selections derived from the bulletin boards. The researcher also conferred with the silent research assistant to check the accuracy of the quotations she reported in her findings. Although participation in the interviews was high, participants may have been weary of the research process by the time the interviews were conducted. These sessions were conducted at the end of the course and represented one of several data collecting strategies. While effort was taken to keep the session to one hour in length, it is understandable that the participants may have been tired of the research experience by this time. The possible impact of subject fatigue, in combination with the complex lives of working nurses needs to be recognized.

As the researcher has already documented, the use of a four-point rubric to assess for evidence of critical thinking in writing was problematic and appeared to have contributed to the interrater reliability problem. It is strongly recommended that researchers conducting this kind of analysis carefully consider the various instruments available and select one with better psychometric properties related to scales, precision, reliability, and validity.

The persona and the professional experiences of the researcher herself likewise require consideration. As a person in her forties with a busy personal and professional life, the researcher

may have been positively biased towards the registered nurses, wanting them to experience positive growth in their critical thinking dispositions and demonstration of critical thinking skills through writing. At the career level, the researcher works with registered nurses on a daily basis and regularly sees the demands in their work lives. The researcher's interests are further related to this project in that she has extensive experience in online and distance education as an instructional designer and instructor of writing at Laurentian University. While these circumstances have made the project personally rich and insightful, they have also meant that extra effort was required to ensure objectivity regarding the data. For example, she solicited the assistance of other scorers when working with the writing samples.

The participant-observer role held by the researcher in relation to the three bulletin boards needs to be noted in this discussion of limitations. As Anderson and Kanuka (2003) suggest, the "e-Researcher is both a participant and a researcher of the environment in which the research occurs" (p. 5). One of the benefits of this approach is that "new social phenomena can be explored in virtual groups, distributed or online discussion groups, and online collaboration (Galagher et al, 1998; Hinds & Kiesler, 2002). In this study then, as the researcher watched the bulletin boards unfold, she may have been influenced to formulate views about online learning settings, critical thinking, and writing before other data were analyzed.

Implications and Applications

This study makes valuable contributions to the research on critical thinking dispositions and skills in online education. Based on rejection of the first hypothesis, the finding that critical thinking dispositions are not positively influenced by online courses that use reflective writing activities may prompt educators to choose certain components related to critical thinking for special development to the exclusion of others. For example, if the educator knows that it is difficult to influence a critical thinking attitude, he or she may choose to focus more on teaching

a critical thinking skill than on preparing an activity that targets attitude development. On the other hand, if a particular critical thinking disposition is essential to the discipline, the instructor knows, from the outset, that he or she may need assistance from an educational expert in designing assignments and activities. The instructor may also decide to modify his or her general teaching style.

The support generated for the second hypothesis regarding perception of writing competence—coupled with the posthoc findings related to the third hypothesis that focused on demonstration of critical thinking though writing—makes an important contribution to the field of andragogy. While practitioners in the adult education field have had longstanding awareness of adult learners' challenges as they balance school, home life, career, family, and community, this study has made clear that, when these learners take online university courses that are reading- and writing-intensive, they require user-friendly, easy-to-access writing supports. This way, the increased confidence that may be reported by an adult learner who has taken an online course may be complemented with increased competence as a writer. It is suggested that this is a win-win situation: increased confidence and competence in writing may lead the student to take additional courses and to grow as a thinker, student, writer, and person.

Findings based on the second and third hypotheses make contributions to the literature dedicated to instructional design and online courses as well as the more general body of literature that examines assessment and critical thinking. To the former, the study has made the contribution that course assignments may elicit different kinds of thinking and that these kinds of thinking depend largely on the design of the assignment. The study has pointed out that writing supports for older adult learners taking online courses need to be designed to maximize access and flexibility. Because of the writing-intensive nature of many university online courses, there may be interdisciplinary opportunities for collaboration among those who work in the

educational technology area, those who work in disciplines wherein writing and thinking are valued in discrete ways, and those who hold content expertise in areas being adapted for online delivery.

As for the study's contribution to the literature that considers assessment of critical thinking, the study has emphasized how there is a distinct need for a tool that assesses critical thinking skill in writing. If text-based online courses are here to stay, critical thinking researchers will want to strategize on the development of a tool that is valid, reliable, and practical to use as quickly as possible.

There were a number of other findings generated by the study that may fuel discussion and other research in the critical thinking field. For instance, the finding that there was growth over time in truthseeking is an information point that adminstrators and faculty at universities may wish to explore, possibly looking for ways to enhance what appears to be a natural evolutionary process among university students. The insights shared by the post-RN participants about instructors in online courses likewise provides fodder for research.

Other important implications of this study pertain to the participants themselves. As all participants received their entry and exit scores for the CCTDI, they have new personal information. As a result, it is anticipated that the participants will consider those areas in which they achieved stronger and weaker scores and establish personal improvement goals. As an aside, one of the instructors involved this project told the researcher how interested her students had been when they received their CCTDI scores.

On another note, because online nursing education programs show no signs of disappearing—a number of online Master's programs in nursing have recently sprung up across the country while online education continues to be a popular mode of delivery for post-RN learning and other continuing education programs for nurses—, it is incumbent upon those who

plan and design online programs for working nurses to be diligent in the choices they make and supports they extend to these learners. While all adult learners have complications in their lives, nurses are experiencing unprecedented levels of workplace stress (Farrington, 1997; Gillespie & Melby, 2003) coupled with encouragement to continue to study. Therefore, effort needs to be made to design and implement flexible programs and learning supports that meet nurses' specialized learning needs. Based on the comments of the post-RN nurses, asynchronous online courses seem to offer the access and flexibility they need. Because of the identified connection between critical thinking and clinical decision making in the practice setting (Daroszewski, Kinser & Lloyd, 2004; Kennison & Misselwitz, 2002; Kessler & Lund, 2004), it is essential to learn as much as possible about how these kinds of courses can support learners' critical thinking dispositions and skills.

Directions for Future Research

Because of the proliferation of online courses in nursing and other disciplines around the world and the role that critical thinking plays in post-secondary education in general, there are many opportunities for research in this area.

Specific to this project, replication of the research design with larger groups of post-RN nurses and with post-RN nurses studying at other universities and in other geographical areas beyond Ontario is suggested. Replication of the study with comparison groups that are better matched is also recommended. Additionally, as the use of web casting, web conferencing, and videoconferencing as teaching and learning methodologies increases, study of critical thinking dispositions and skills in these learning contexts is appropriate. It might also be valuable to compare the CCTDI scores of different groups of older working learners who are taking online courses: for example, by comparing the scores of nurses and teachers, valuable insights might be generated into how to tailor learning strategies to specific learner groups. Research is further

suggested in online workplace training and critical thinking. As noted earlier, the relationship between personal learning style and technology-enabled education is an area suggested for further study.

Research is recommended into the relationship between writing confidence and writing performance among adult learners in general and adults studying specific disciplines. Findings in this area could then be used to inform choices that faculty members and program development units make to support learners who are taking writing-intensive courses. On a related note, there is work to be done to identify the role that reading plays in online courses and how to maximize growth in critical thinking skills through learning strategies that involve both reading and writing.

Research into adequate levels and kinds of support for adult learners is strongly recommended, as is research into adequate levels of support for faculty members teaching technology-based courses. In learning situations where there are new and different technologies involved, research is always necessary to identify the supports that instructors require so that they can concentrate on their subject matter and their students in contrast with the intricacies of new educational technologies.

While the overall dispositional changes in this study were not demonstrated to be statistically significant, it is nevertheless suggested that the study does point to a need for work in the area of university-level education and critical thinking dispositions. Work is especially recommended in the areas of truthseeking and inquisitiveness, the dispositions at the low and high ends of the measurement spectrum. Some questions that emerged from this study are as follows: based on the evidence that the learners scored highest on inquisitiveness, are university students at the baccalaureate level motivated most by a sense of inquisitiveness? Does truthseeking become an important personal goal only after the disposition of inquisitiveness has

been appeased or is there a complementary relationship between them? Would the patterns noted in the study sustain over months and years? What are the differences between the critical thinking dispositions of undergraduate and graduate-level students? What is the effect of educational technologies on these dispositions?

In the context of nursing education, there may be a special need to do focused research into truthseeking. Dr. Ellen Rukholm, former chair of Laurentian University's School of Nursing, remarked on the low scores of the nursing students in truthseeking in this study. She pointed out that some nursing curricula suggest that, in nursing, there are many truths (personal communication, October 12, 2005). While this may be the case in the context of postmodern nursing, if the idea of many truths curbs students' truthseeking dispositions, schools of nursing may wish to examine this issue in some depth.

From the perspective of learning theory, this study points to the need for aggressive research into both the general role and practical design implications of constructivist learning in distance-based online education as well as in specific subject areas when they are presented in the online setting.. On a more focused basis, researchers must explore the nature and meaning of interactive learning in the online educational setting, the unique role of the teacher, how meaningful collaborative learning can be facilitated, learner control in the online educational process, and transformational learning as enabled in this learning setting that promises to be an integral part of twenty-first century education (Ally, 2004).

Final Thoughts

Online courses as offered by the professional schools of Canadian universities are in a strong growth situation. While the reasons for this growth are many, based on this study, one reason that stands out is that online education provides busy professionals the access and flexibility they require to meet their learning goals while balancing work and personal

responsibilities. Recognizing this, it is important that the universities and other learning institutions that develop and deliver these programs know how they can most effectively support and encourage these learners as thinkers and writers.

Given its focus and the hypotheses examined, this study has made a contribution to the literatures that deal with online education, adult education, writing, critical thinking, instructional design, and various combinations thereof. This study has also revealed that there is further work to be done if postsecondary educators wish to understand more deeply the critical thinking dispositions that most strongly motivate university students. If educators know more about these dispositions as possible learning motivators, curriculum reform and instructional design may facilitate achievement of learning that is personally meaningful and in line with professional competencies more effectively. Finally, the study includes recommendations for modifications of constructivist learning theory in specific contexts.

REFERENCES

Abegglen, J. (1997). Critical thinking in nursing: Classroom tactics that work. *Journal of Ontario Education, 36*, 452-458.

Affonso, D. (2002, October). Keynote address delivered at Registered Nurses Association of Ontario (RNAO) conference called Embracing the Future: Educating Tomorrow's Nurses. Toronto, ON.

Airasian, P.W., & Walsh, M.E. (1997). Constructivist cautions. *Phi Delta Kappan, 78,* 444-449.

Ally, M. (2004). Foundations of educational theory for online learning. In Terry Anderson and Fathi Elloumi (Eds.), *Theory and practice of online learning*. Athabasca, AB: Athabasca University. Retrieved on February 5, 2005, from http://cde.athabascau.ca/online_book/index/html.

American Nurses Association. (1995). Definition and social policy statement. In J. Watson, *Post-modern nursing and beyond* (p. 41). Edinburgh: Churchill Livingston.

American Philosophical Association. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. *The Delphi report executive summary: Research findings and recommendations prepared for the committee on pre-college philosophy*. Milbrae, CA: The California Academic Press.

Anderson, T., & Elloumi, F. (2004). *Theory and practice of online learning*. Athabasca, AB: Athabasca University. Retrieved on December 1, 2006, from http://epe.lac-bac.gc.ca/100/200/300/athabasca_univ/theory_and_practice/index.html

Anderson, T. (2003). Modes of interaction in distance education: Recent developments and research questions. In M. Moore (Ed.), *Handbook of distance education*. Mahwah, NJ: Erlbaum.

Anderson, T., & Kanuka, H. (2003). *E-research: Methods, strategies, and issues.* Boston, MA: Pearson Education, Inc.

Anderson, T., Rourke, L., Garrison, D.R., & Archer, W. (2001). Assessing teacher presence in a computer conferencing context. *Journal of Asynchronous Learning Networks, 5*(2). Retrieved on June 06, 2006, from http://www.aln.org/alnweb/journal/Vol5_issue2/Anderson/5_issue2/Anderson5-2%20JALN%20 Anderson%20Assessing.htm.

Anderson, T., Varnhagen, S., & Campbell, K. (1998). Faculty adoption of teaching and learning technologies: Contrasting early adopters and mainstream faculty. *Canadian Journal of Higher Education, 28*(3), 71-98.

Andrusyszyn, M.A., Cragg, B., & Humbert, J. (2001). Nurse practitioner preferences for distance education methods related to learning style, course content, and achievement. *The Journal of Nursing Education, 40*, 163-170.

Andrusyszyn, M., & Davie, L. (1997). Facilitating reflection through interactive journal writing in an online graduate course: A qualitative study. *Journal of Distance Education, X11*(1/2), 103-126.

Attewell, P. (2001). The first and second digital divide. *Sociology of Education, 74*(3), 252-259.

Atwell, N. (1998). *In the middle.* Portsmouth, NH: Heinemann.

Atwell, N. (1991). *Side by side: Essays on teaching to learn.* Portsmouth, NH: Heinemann, pp. 140-141.

Aune, B. (1967). *Thinking: Encyclopedia of philosophy* (Vol. 8). New York: Macmillan.

Bachmann, J., & Panzarine, S. (1998). Enabling nurses to use the information highway. *Journal of Nursing Education, 37*, 155-161.

Baker, C.R. (1996). Reflective learning: A teaching strategy for critical thinking. *Journal of Nursing Education, 35*, 19-22.

Bandman, E.L., & Bandman, B. (1988). *Critical thinking in nursing*. Norwalk, CT: Appleton and Lange.

Barnet, S., Berman, M., Burto, W., Cain, W.E., & Stubbs, M. (2000). *Literature for composition: Essays, fiction, poetry, and drama*. New York: Longman.

Bartlett, D., & Cox, P. (2000). Critical thinking dispositions of undergraduate physical therapy, students: Implications for instruction and counselling. *Physiotherapy Canada,* 16-25.

Bartlett, D., & Cox, P. (2002). Measuring change in student's critical thinking ability: Implications for health care education. *Journal of Allied Health, 31*(2), 64-69.

Barriball, K.L., While, A.E., & Norman, I.J. (1992). Continuing professional education for qualified nurses: A review of literature. *Journal of Advanced Nursing, 17,* 1129-1140.

Bash, L. (2003). *Adult learners in the academy*. Bolton, MA: Anker Publishing Company, Inc.

Bates, A.W. (1995). *Technology, open learning and distance education*. New York: Routledge.

Bates, A.W. (2000). *Managing technological change: Strategies for college and university leaders.* San Francisco: Jossey-Bass Publishers.

Baxter-Magolda, M.B. (1992). *Knowing and reasoning in college: Gender-related patterns in students' intellectual development*. San Francisco, CA: Jossey-Bass.

Belenky, M.F., Clinchy, B.M., Golberger, N.R., & Taurule, J.M. (1986). *Women's ways of knowing: The development of self, voice, and mind*. NewYork: Basic Books.

Bell, M.L., Heye, M.L., Campion, L., & Hendricks, P.B., (2002). Evaluation of a process-focused learning strategy to promote critical thinking. *Journal of Nursing Education, 41,* 175-177.

Berliner, D.C. (1979). Tempus educare. In P.L. Peterson, & H.J. Walberg (Eds.). *Research on teaching*. Berkeley, CA: McCutchan.

Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research and Development, 18*(1), 57-75.

Bilinski, H. (2002). The mentored journal. *Nurse Educator, 27*(1), 37-41.

Billings, D. (1999). The "next generation" distance education: Beyond access and convenience, *Journal of Nursing Education, 38*(6), 246.

Billings, D., Connors, H. & Skiba, D. (2001). Benchmarking best practices in web-based nursing courses. *Advances in Nursing Science, 23*(3), 41-52.

Billings, D.M., & Bachmeier, B. (1994). Teaching and learning at a distance: A review of the nursing literature. In L.R. Allen (Ed.), *Review of research in nursing education.* New York: National League for Nursing.

Billings, D., & Rowles, C. (2001). Development of continuing nursing education offerings for the World Wide Web. *The Journal of Continuing Education in Nursing, 32*(3), 107.

Blanchette, J. (2001). Questions in online learning environment. *Journal of Distance Education, 16*(2), 37-57.

Block, J.H. & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W.A. Collins (Ed.), *Minnesota Symposia on Child Psychology* (Vol. 13, pp. 39-101). Hillsdale, NJ: Erlbaum.

Bloom, B. S. (1976). *Human characteristics and school learning.* New York: McGraw-Hill.

Bonk, C.J., & King, K.S. (Eds.). (1998). *Electronic collaborators, learner-centered technologies for literacy, apprenticeship, and discourse.* Mahwah, NJ: Erlbaum.

Boud, D., Keough, R., & Walker, D. (1985). *Reflection: Turning experience into learning.* London: Kegan Page.

Brookfield, S.D. (1987). *Developing critical thinkers: Challenging adults to explore alternative ways of thinking and acting.* San Francisco: Jossey-Bass.

Brooks, E., Fletcher, K., & Wahlstedt, P. (1998). Focus group interviews: Assessment of continuing education needs for the advanced practice nurse. *Journal of Continuing Education in Nursing, 29*(1), 27.

Brown, H. N., & Sorrell, J.M. (1993). Use of clinical journals to enhance critical thinking. *Nurse Educator, 18*(5), 16-19.

Bruner, J. (1966). *The process of education.* Cambridge, MA: Harvard University Press.

Bullen, M. (1998). Participation and critical thinking in online university distance education. *Journal of Distance Education, 13*(2), 1-32.

Burt, M.T., Grady, M., & McMann, G. (1994). *Interaction analysis of an inter-university computer conference*. Paper presented at the Distance Learning Research Conference, College Station, TX.

Burge, E. (2000). Gender in distance education. In C. Campbell-Gibson (Ed.), *Distance learners in higher education* (pp. 25-45). Madison, WI: Atwood Publishing.

Burrows, D.E. (1995). The nurse teacher's role in the promotion of reflective practice. *Nurse Education Today, 15*, 346-350.

Byrne, M.W., & Keffe, M.R. (2002). Building research competence in nursing through mentoring. *Journal of Nursing Scholarship, 34*(4) 391-397.

Calkins, L. M. (1994). *The art of teaching writing*. Portsmouth, NH: Heinemann.

Callister, L.C. (1996). Maternal interviews: A teaching strategy fostering critical thinking. *Journal of Nursing Education, 35*, 29-30.

Canadian Nurses Association. (2003). *2002 Canadian nursing statistics*. Ottawa, ON. Retrieved on July 31, 2004, from http://www.cna-alic.ca/frames/resources/statsframe.htm.

Carper, B. (1978). Fundamental ways of knowing in nursing. *Advances in Nursing Science, 1*(1), 13-23.

Carroll, J.B. (1963). A model of school learning. *Teachers College Record, 64*(8), 723-733.

Carter, L., Rukholm, E., Mossey, S., Viverais-Dresler, G., Bakker, D. & Sheehan, C. (2006). Critical thinking in the online nursing education setting: Raising the bar. *Canadian Journal of University Continuing Education, 32*(1), 27-46.

Carter, L., Rukholm, E., & Mossey, S. (2006). (Tech. Rep.). Stroke Best Practices for Nurses: A Technology-enabled Education and Research Project. Toronto: Ontario Ministry of Health and Long-term Care.

Carter, L., & Rukholm, E. (2002). On-line scholarly discourse: Lessons learned for continuing and nurse educators. *Canadian Journal of University Continuing Education, 28*(2), 31-48.

Carter, L., & Rukholm, E. (2002). Nursing Health Assessment on the Web. (Tech. Rep.). Ottawa: Office of Learning Technologies, Human Resources Development Canada.

Carter, L., Wiebe, N., & Boissonneault, J. (2002, May). Wizards of things teaching and learning, or why your institution needs instructional designers. Paper presented at the Canadian Association for University Continuing Educators (CAUCE) Annual Conference.

Carter, L., & Rukholm, E. (2000). Cardiac Care on the Web. (Tech. Rep.). Ottawa: Office of Learning Technologies, Human Resources Development Canada.

Case, B. (1994). Walking around the elephant: A critical thinking strategy for decision making. *The Journal of Continuing Education in Nursing, 25*, 101-109.

Claytor, K. L. (1997). *The development and validation of an adult medical nursing critical thinking instrument*. Indiana University

Clizzizza, J.E. (1970). *The construction and evaluation of a test of critical thinking ability, grades 7-8*. Boston, MA: Boston University School of Education.

Cody, W.K. (2002). Critical thinking and nursing science: Judgment or vision? *Nursing Science Quarterly, 15*, 184-189.

Cohen, P., & Dacanay, L. (1994). A meta-analysis of computer-based instruction in nursing education. *Communication Education, 50*(2), 109-124.

Colomb, G. (1988). Disciplinary 'secrets' and the apprentice writer: The lessons for critical thinking. Upper Monclair, New Jersey. Institute for Critical Thinking.

Colucciello, M.L. (1999). Relationships between critical thinking dispositions and learning styles. *Journal of Professional Nursing, 15*, 294-301.

Conry, J.C. (1998). Alma matters: Nursing students refine online learning. *The Ohio State University College of Nursing Magazine, 8*(1), 8-9.

Costa, P.T., & McCrae, R.R. (1985). *The NEO Personality Inventory Manual*. Odessa, FL: Psychological Assessment Resources.

Council of Ontario Universities Highlights. (2000, May) Funding for collaborative nursing programs set out. Retrieved on July 15, 2002, from http://www.cou.on.ca?content/objects/CH_May2000.pdf

Cragg, C.E., Andrusyszyn, M., & Fraser, J. (2005). Support for women taking professional programs by distance education. *Journal of Distance Education, 14*(1), 1-13.

Cragg, C.E. (1994a). Distance learning through computer conferences. *Nurse Educator, 9*(2), 10-14.

Cragg, C.E. (1994b). Nurses' experience of a post-RN course by computer-mediated conferencing: Friendly users. *Computers in Nursing, 12*(5), 221-226.

Cranton, P. (1994). *Understanding and promoting transformative learning: A guide for educators of adults.* San Francisco: Jossey-Bass Publishers.

Cravener, P.A. (1999). Faculty experiences with providing online courses: Thorns among the roses. *Computers in Nursing, 17*(1), 42-47.

Creswell, J.W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches* (2nd Ed.). London: Sage.

Cudney, S., Craig, C., Nichols, E., & Weinert, C. (2004). Barriers to recruiting an Adequate sample in rural nursing research. *Online Journal of Rural Nursing and Health Care, 4*(2).

Cunningham, D., Duffy, T. M., & Knuth, R. (1993). Textbook of the future. In C. McKnight (Ed.), *Hypertext: A psychological perspective*. London: Ellis Horwood Publishing.

Daley, B.J., Shaw, C.R., Balistrieri, T., Glasenapp, K., & Piacentine, L. (1999). Using concept maps: A strategy to teach and evaluate critical thinking. *Journal of Nursing Education, 38*, 42-47.

Daroszewski, E.B., Kinser, A.G., & Lloyd, S.L. (2004). Online, directed journaling in community health advanced practice nursing clinical education. *Journal of Nursing Education, 43*(4), 175-180.

Davis, B.H., & Brewer, J.P. (1997). *Electronic discourse: Linguistic individuals in virtual space.* Albany, NY: State University of New York Press.

Day, R., & Payne, L. (1987). Computer-managed instruction: An alternative teaching strategy, *Journal of Nursing Education, 26*(1), 3036-3042.

DeBourgh, G. (2001). Using web technology in a clinical nursing course. *Nurse Educator, 26*(5), 227-233.

Dede, C. (1991). Emerging technologies: Impacts on distance education. *Annals of the American Academy of Political and Social Science, 514*(1), 146-158.

Dewey, J. (1916). *Democracy and education.* New York: Macmillan.

Dewey, J. (1933). Why reflective thinking must be an educational aim. *How We Think.* Boston: D.C. Heath.

Dick, W., & Carey. (1996). *The systematic design of instruction* (4th Ed.). New York: Harper Collins College Publishers.

Dillman, D.A., Tortora, R.D. and Bowker, D. (1998a). Influence of plain versus fancy design on response rates for web surveys. *Proceedings of Survey Method Section.* Annual Meeting of the American Statistical Association, TX.

Dillman, D.A., Tortora, R.D. and Bowker, D. (1998b). Principles for constructing web surveys. *Social and Economic Sciences Research Centre Technical Report 98-50,* Pullman: WA.

Dobozy, E. (1999). Constructivist and Montessorian perspectives on student autonomy and freedom. *Proceedings* Western Australian Institute for Educational Research Forum. Retrieved February 12. 2005, from http://education.curtin.edu.au/waier/forums/1999/dobozy.html

Doolittle, P.E. (1999). Constructivism and online education. Virginia Polytechic Institute & State University. Retrieved March 13, 2002, from http://www.tandl.vt.edu/doolittle/research/toho1999/pedagogy.html.

Droste-Bielak, E.M. (1986). Two techniques for teaching interviewing: A comparative study. *Computers in Nursing, 4,* 152-156.

Duchscher, J.E. (2003). Critical thinking: Perceptions of newly graduated female baccalaureate nurses. *Journal of Nursing Education, 42*(1), 14-27.

Duffy, M.E. (2002). Methodological issues in web-based research. *Journal of Nursing Scholarship, 34*(1), 83-93.

Easton, S. (2003). Clarifying the instructor's role in online distance learning. *Communication\Education, 52*(2), 87-105.

Eerden, K.V. (2001). Using critical thinking vignettes to evaluate student learning. *Nursing and Health Care Perspectives, 22*, 231-234.

Elbow, P. (1991). Reflections on academic discourse: How it relates to freshmen and colleagues. *College English, 53*(2), 35-155.

Elliott, D. (1996). Promoting critical thinking in the classroom. *Nurse Educator, 21*, 49-52.

Ellis, R.A. (2005). Learning through inquiry: Student difficulties with on-line course-based materials. *Journal of Computer Assisted Learning, 21*(4), 239-252.

Ennis, R.H., Millman, J., & Tomiko, T.N. (1985). *Cornell critical thinking test, level X and level Z manual* (3rd Ed.). Pacific Grove, CA: Midwest Publications.

Erickson, F., & Schultz, J. (1992). Students' experience of the curriculum. In P. Jackson (Ed.), *Handbook of research on curriculum*. New York: Macmillan, 465-485.

Facione, P.A., & Facione, N.C. (1992). *The California Critical Thinking Disposition Inventory.* Milbrae, CA: California Academic Press.

Facione, P.A ., & Facione, N.C. (1992). *Holistic Critical Thinking Scoring Rubric*. California Academic Press. Millbrae, CA.

Facione, P.A., Giancarlo, C.A., Facione, N.C., & Gainen, J. (1995). The disposition towards critical thinking. *Journal of General Education, 44,* 1-25.

Facione, N.C., & Facione P.A. (1997). *Critical thinking assessment in nursing education programs: An aggregate data analysis*. Millbrae, CA: California Academic Press.

Facione, P.A., Facione, N.C., & Giancarlo, C.A. (1998). *The California Critical Thinking Disposition, Inventory Test Manual*, revised. Millbrae, CA: California Academic Press.

Facione, P.A., Facione, N.C., & Giancarlo, C.A. (2000). *California Critical Thinking Disposition Inventory*. Millbrae, CA.: California Academic Press.

Facione, P.A., Facione, N.C., & Giancarlo, C. (2001). California Critical Thinking Disposition Inventory Manual. Millbrae, CA: California Academic Press.

Farrington, A. (1997). Strategies for reducing stress and burnout in nursing. *British Journal of Nursing, 6*(1), 44-50.

Feely, T. (1975). Predicting students' use of evidence. *Theory and Practice in Social Education, 3*(1), 63-72.

Ford, J.S., & Profetto–McGrath, J. (1994). A model for critical thinking within the context of curriculum as praxis. *Journal of Nursing Education, 33*, 341-344.

Fosnot, C.T. (Ed.). (1996). *Constructivism: Theory, perspectives, and practice*. New York: Teachers' College Press, Columbia University.

Fraser, J., Cragg, B., & Andrusyszyn, M. (2003). Advantages and stressors for multiple role professional women using different distance education technologies. (Tech. Rep.). Ottawa: Office of Learning Technologies, Human Resources Development Canada.

Freedman, A. (1993). Show and tell? The role of explicit teaching in the learning of new genres. *Research in the Teaching of English, 27*(3), 222-251.

Furedy, C., & Furedy, J. (1985). Critical thinking towards research and dialogue. In J.G. Donald & A.M. Sullivan (Eds.), *Using research to improve thinking: New directions for teaching and learning* (pp. 51-69). San Francisco: Jossey-Bass.

Gagne, R. (1987). *Instructional technology: Foundations.* Hillsdale, NJ: Erlbaum.

Galagher, J., Sproull, L., & Kiesler, S. (1998). Legitimacy, authority, and community in electronic support groups. *Written Communication, 15*(4), 493-530.

Garrison, D.R., & Anderson, T. (2003). *E-learning in the 21st century: A framework for research and practice*. London: Routledge.

Gaston, S. (1988). Knowledge, retention, and attitude effects of computer-assisted instruction. *Journal of Nursing Education, 27*(1), 30-34.

Gerlach, V.C., & Ely, D.P. (1980). *Teaching and media: A systematic approach* (2nd Ed.). Englewood Cliffs, NJ: Prentice-Hall.

Gibson, S., & Rose, M. (1986). Managing computer resistance. *Personal Computing, 4*, 201-204.

Gillespie, M. & Melby, V. (2003). Burnout among nursing staff in accident and emergency and acute medicine: A comparative study. *Journal of Clinical Nursing, 12*(6), 842-849.

Gordon, D. (2005). The education of story lovers. *Curriculum Inquiry, 35*(2), 133-159.

Graves, D. H. (1983). *Writing: Teachers and children at work.* Portsmouth, NH: Heinemann.

Graves, D. H. (1994). *A fresh look at writing*. Portsmouth, NH: Heinemann.

Gray, G., & Guppy, N. (1994). *Successful surveys: Research methods and practice*. Toronto, ON: Harcourt Brace.

Gunawardena, C.N., Lowe, C., & Anderson, T. (1997). Analysis of a global online debate and the development of an interaction analysis model for examining social construction and knowledge in computer conferencing. *Journal of Educational Computer Research, 17*(4), 397-431.

Hamby, C.S. (1986). A study of the effects of computer-assisted instruction on the attitude and achievement of vocational nursing students. *Computers in Nursing, 4*, 109-113.

Hannafin, M.J., & Peck, K.L. (1987). *The design, development, and evaluation of instructional software.* New York: Macmillan Publishing.

Hara, N., Bonk, C.J., & Angeli, C. (2000). Content analysis of online discussion in an applied educational psychology course. *Instructional Science, 28*, 115-152.

Harasim, L., Hiltz, S., Teles, L., & Turoff, M. (1996). *Learning networks: A field guide to teaching and learning online*. Cambridge, MA: The MIT Press.

Harden, J.K. (2003). Faculty and student experiences with web-based discussion groups in a large lecture setting. *Nurse Educator, 28*(1), 26-30.

Harnishfeger, A., & Wiley, D.E. (1976). The teaching-learning process in elementary schools: A synoptic view. *Curriculum Inquiry, 6*(1), 5-43

Harris, M. (1986). *Teaching one-to-one.* Urbana, IL: National Council of Teachers of English.

Henriques, L. (1997). *A study to define and verify a model of interactive-constructive elementary school science teaching.* Unpublished PhD Dissertation. University of Iowa, Iowa City, IA.

Hinds, P. & Kiesler, S. (Eds.). (2002). *Distributed work.* Cambridge, MA: MIT Press.

Honebein, P. (1996). Seven goals for the design of constructivist learning environments. In B. Wilson (Ed.), *Constructivist learning environments: Case studies in instructional design* (pp. 11-24). New Jersey: Educational Technology Publications.

Hooper S., & Hanafin, M.J. (1991).The effects of group composition on achievement, interaction, and learning efficiency during computer-based cooperative instruction. *Educational Technology Research and Development, 39*(3), 27-40.

Huit, W. (1995). A systems model of the teaching/learning process. *Valdosta, GA: College of Education.* Valdosta State University.

Humbert, J., & Doucette, S. (2006, April). Nurse practitioner program: Learning by distance in a ten university consortium. Paper presented as part of E-Education series. NORTH Network, A Partner in Ontario Telehealth Network.

Ibarreta, G.I., & McLeod, L. (2004). Thinking aloud on paper: An experience in journal writing. *Journal of Nursing Education, 43*(3), 134-137.

Ip, W.Y., Lee D.T., Lee, I.F, Chau, J.P. Wootton, Y.S., Chang, A.M. (2000). Disposition towards critical thinking: A study of Chinese undergraduate nursing students. *Journal of Advanced Nursing, 32*, 84-90.

Ironside, P.M. (2003). New pedagogies for teaching thinking: The lived experiences of students and teachers enacting narrative pedagogy. *Journal of Nursing Education, 42*(11), 509-516.

Ironside, P.M. (2004). 'Covering Content' and teaching thinking: Deconstructing the additive curriculum. *Journal of Nursing Education, 43*(1), 5-12.

Issac, S., & Michael, W.B. (1997). *Handbook in research and evaluation: For education and the behavioural sciences*. San Diego, CA: Educational and Industrial Testing Services.

James, W. B., & Gardner, D.L. (1995). Learning styles: Implications for distance learning. *New Directions for Adult and Continuing Education,* 67, 19-31.

Jenkins, P., & Turick-Gibson, T. (1999). An exercise in critical thinking using role playing. *Nurse Educator, 24*(6), 11-14.

Jochems, W. (2003). Application of instructional systems design approach by teacher in higher education: Individual versus team design. *Teaching and Teacher Education, 19*(6), 581-591.

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

Johns, C. (1996). Visualizing and realizing care in practice through guided reflection. *Journal of Advanced Nursing Practice, 24*, 1135-1143.

Johnson, D.W., & Johnson, R.T. (1996). Cooperation and the use of technology. In D.H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 170-198). New York: Simon & Schuster Macmillan.

Johnstone, S. (1991). Research on telecommunicated learning: Past, present, and future. *Annals of the American Academy of Political and Social Science, 514*(1), 49-57.

Jonassen, D.H. (1991a). Evaluating constructivistic learning. *Educational Technology, 28*(11), 13-16.

Jonassen, D. H. (1991b). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5-14.

Jonassen, D. H. (1999). Designing constructivist learning environments. In C. M. Reigeluth (Ed). *Instructional design theories and models: A new paradigm of instructional theory* (Vol. 2, pp. 215-239). New Jersey: Lawrence Erlbaum Associates.

Jones, D.C., & Sheridan, M.E. (1999). A case study approach: Developing critical thinking skills in novice pediatric nurses. *The Journal of Continuing Education in Nursing, 30,* 75-78.

Jones, S.A., & Brown, L.N. (1991). Critical thinking: Impact on nursing education. *Journal of Advanced Nursing, 16,* 529-533.

Kemp, J. (1994). *The instructional design process.* New York, NY: Harper Row.

Kennison, M.M., & Misselwitz, S. (2002). Evaluating reflective writing for appropriateness, fairness, and consistency. *Nursing Education Perspectives, 23*(5), 238-242.

Kessler, P., & Lund, C. (2004). Reflective journaling: Developing on-line journal for distance education. *Nurse Educator 29*(1), 20-24.

Kincheloe, J.L., & McLaren, P.L. (1994). Rethinking critical theory and qualitative research. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of qualitative research.* London: Sage.

Kirszner, L,G., & Mandell, S.R. (2001). *Instructor's guide to accompany literature: Reading, reacting, writing.* Fort Worth: Harcourt College Publishers.

Kitchener, K.S., & King, P.M. (1990). The reflective judgment model: Transforming assumptions about knowing. In J. Maestri & Associates (Eds.), *Fostering critical reflection in adulthood.* San Francisco: Jossey-Bass.

Knirk, F.G., & Gustafson, K.L. (1986). *Instructional technology: A systematic approach to education.* Forth Worth, TX: Holt, Rinehart, & Winston.

Knowles, M. (1975). *Self-directing learning: A guide for learners and teachers.* New York: Cambridge Book Co.

Knowles, M. (1978). *The adult learner: A neglected species.* Houston, TX: Gulf Publishing Company.

Knowles, M. (1980). *The modern practice of adult education.* New York: Association Press.

Knowles, M.S. (1984). *The adult learner: A neglected species* (3rd Ed.). Houston: Gulf Publishing Company.

Ko, S., & Rossen, S. (2004). *Teaching on-line: A practical guide.* Boston, MA: Houghton Mifflin Company.

Krejci, J.W. (1997). Imagery: Stimulating critical thinking by exploring mental models. *Journal of Nursing Education, 36,* 482-484.

Krueger, L. (2000). How hypermodern technology in social work bites back. *Journal of Social Work Education, 36*(1), 103-114.

Kanuka, H., & Anderson, T. (1998). Online social interchange, discord, and knowledge construction. *Journal of Distance Education 13*(1), 57-74.

Lauder, W., & James, B. (2001). A comparison of critical thinking skills in standard and non-standard entry diploma students. *Nurse Education in Practice, 7,* 212-220.

Laurentian University (School of Nursing Student Manual, 2006). Retrieved on April1, 2006, from http://nursing.laurentian.ca/syllabi.asp.on

Leaver-Dunn, D., Harrelson, G.L., & Malissa, M., & Wyatt, T. (2004). Critical thinking predisposition among undergraduate athletic training students. *Journal of Athletic Training, 37*(4), 47-151.

Leonard, T. (2003). RN to BSN: Advice on returning to school. *Association of Operating Room Nurses (AORN), 77*(3), 598-608.

Levin, B. (1995). Improving educational productivity though a focus on learners. *International Studies in Educational Administration, 60*, 15-21.

Lundy, E.E., Irani, T.A., Ricketts, J.C., Eubanks, S.G., Rudd, R.D., Gallo-Meagher, M., & Fulford, S.G. A mixed-methods study of undergraduate dispositions toward thinking critically about biotechnology. Paper presented at the National Agricultural Education Research Conference. Las Vegas, NV.

Malloy, S., & De Natale, M.L. (2001). On-line critical thinking: A case study analysis. *Nurse Educator 26*(4), 191-197.

Mandorin, S. & Iwasiw, C. (1999). The effects of computer-assisted instruction on the self-efficacy of baccalaureate nursing students. *Journal of Nursing Education, 38*(6), 282.

Maor, D. (2003). The teacher's role in developing interaction and reflection in an online learning community. *Educational Media International, 40*(1-2), 127-138.

Marton, F., Hounsell, D., and Entwistle, N. (1997). *The experience of learning implications for teaching and studying in higher education* (2nd ed.), Edinburgh: Scottish Academic Press.

McCarthy, P., Schuster, P., Zehr, P. & McDougal, D. (1999). Evaluation of critical thinking in a baccalaureate nursing program. *Journal of Nursing Education, 38*(3), 142-144.

McLean, C. (2005). Evaluating critical skills: Two conceptualizations. *Journal of Distance Education, 20*(2), 1-20.

McKenzie, W., & Murphy, D. (2000). "I hope this goes somewhere": Evaluation on an online discussion group. *Australian Journal of Educational Technology, 16*(3), 239-257.

McLester, S. (2005). Back to the future. *Technology and Learning, 26*(2), 38.

McVicar, A. (2003). Workplace stress in nursing: A literature review. *Journal of Advanced Nursing, 44*(6), 633-642.

Meier, S., McCarthy, P., & Schmeck, R. (1984).Validity of self-efficacy as a predictor of writing performance. *Cognitive Therapy and Research, 8*(2), 107-120.

Mergel, B. (1998). Instructional design and learning theory. Unpublished graduate paper for Educational Communications and Technology, University of Saskatchewan, May 1998. Retrieved February 12, 2005, from http://www.usaskca/education/coursework/802papers/mergel/mergel.PDF

Meyer, K.A. (2003). Face-to-face versus threaded discussions: The role of time and higher-order thinking. *Journal of Asynchronous Learning Networks, 7*(3), 55-64.

Meleis, A. (2002, October). Keynote address delivered at Registered Nurses Association of Ontario (RNAO) conference called Embracing the Future: Educating Tomorrow's Nurses. Toronto, ON.

Merriam, S.B., & Caffarella, R.S. (1999). *Learning in adulthood: A comprehensive guide* (2nd Ed.). San Francisco: Jossey-Bass.

Mezirow, J. (1981). A critical theory of adult learning and education. *Adult Education, 32*, 3-24.

Mezirow, J. (1990). *Fostering critical reflection in adulthood: A guide to transformative and emancipatory learning.* San Francisco: Jossey-Bass.

Miller, C. D., Finley, J., & McKinley, D.L. (1990). Learning approaches and motives: Male and female differences and implications for learning assistance programs. *Journal of College Student Development, 27*, 147-154.

Miller, J.B. (2002). Examining the interplay between constructivism and different learning styles. *ICOTS6: The Sixth International Conference on Teaching Statistics,* Cape Town, South Africa. July 7-12, 2002. Retrieved February 12, 2005, from http://www.stat.auckland.ac.nz/~iase/publications/1/8a4_mill.pdf.

Mills, J.E., Francis, K.L., & Bonner, A. (2005). Mentoring, clinical supervision and preceptoring: Clarifying the conceptual definitions for Australian rural nurses. A review of the literature. *Rural and Remote Health,5*, 410. Retrieved on December 3, 2006, from http://rrh.deakin.edu.au.

Moallem, M. (2001). Applying constructivist and objectivist learning theories in the design of a web-based course: Implications for practice. *Educational Technology and Society, 4*(3), 1436-4522.

Morris, N., Buck-Rolland, C., & Gagne, M. (2002). From bricks to bytes: Faculty and student perspectives of online graduate nursing courses. *Computers, Informatics, Nursing, 20*(3), 108-114.

Morse, J. & Richards, L. (2002). *READ ME FIRST for a user's guide to qualitative methods.* London: Sage.

Mottola, C.A., & Murphy, P. (2001). Antidote dilemma-an activity to promote critical thinking. *The Journal of Continuing Education in Nursing, 32,* 161-164.

Muff, A. (1999). In J. Watson. *Post-modern nursing and beyond.* London: Churchill Livingstone.

Murphy, K.L., & Cifuentes, L. (2001). Using Web tools, collaborating, and learning online. *Distance Education, 22*(2), 285-305.

Murphy, E. (1997). *Constructivist learning environments.* Retrieved March 12, 2002, from http://www.stemne.nf.ca/~elmurphy/emurphy/constructivism.html

Neil, R.M. (1985). Effects of computer-assisted instruction on nursing student learning and attitude. *Journal of Nursing Education. 24*(2), 72-75.

Neuhauser, C. (2002). Learning style and effectiveness of online and face-to-face instruction. *American Journal of Distance Education, 16*(2), 99-113.

Norris, S. & Ennis, R. (1989). *Evaluation of critical thinking*. Pacific Grove, CA: Midwest Publications.

Oermann, M., Truesdell, S., & Ziolkowski, L. (2000). Strategy to assess, develop, and evaluate critical thinking. *The Journal of Continuing Education in Nursing, 31*, 155-160, 190-191.

Oswold, M. (Trans.). (1962). *Aristotle: Nichomachean ethics.* New York: Bobbs-Merrill.

Palloff, R.M., & Pratt, K. (1999). *Building learning communities in cyberspace*. San Francisco: Jossey-Bass.

Papanastasion, E. (2003). Can computer use hurt science achievement? The USA results from PISA. *Journal of Science and Technology, 12*(3), 325-332.

Pascarella, E.T., & Terenzini, P.T. (1991). *How college affects students: Findings and insights from twenty years of research.* San Francisco: Jossey-Bass.

Paul, R. (1993). *Critical thinking: What every person needs to survive in a rapidly changing world.* Santa Rosa, CA: The Foundation for Critical Thinking.

Paulson, M. (1995). Moderating educational computer conferences. In Z. Berge and M. Collins (Eds.), Computer mediated communication and the online classroom (pp. 81-90). Cresskill, NJ: Hampton Press, Inc.

Pendarvis, F. (1996). *Critical thinking assessment: Measuring a moving target.* Rock Hill, SC: The South Carolina Higher Education Assessment Network.

Peslak, A. R. (2005). The educational productivity paradox. *Communications of the ACM, 48*(10), 111-114.

Perciful, E.G., & Nester, P.A. (1996). The effect of an innovative clinical teaching method on nursing students' knowledge and critical thinking skills. *Journal of Nursing Education, 35*, 23-28.

Perry, W.G. (1970). *Forms of intellectual and ethical development in the college years.* New York: Holt, Rinehart, & Winston.

Poirrier, G. (2000). Letter from the guest editor. *Language and Learning Across the Curriculum, 5*(1), 2-5.

Powell, J. (1989). The reflective practitioner in nursing. *Journal of Advanced Nursing, 14*, 824-832.

Prawat, R.S., & Floden, R.E. (1994). Philosophical perspectives on constructivist views of learning. *Educational Psychology, 29,* 37-48.

Profetto-McGrath, J. (1998). Critical thinking skills and critical thinking dispositions of baccalaureate nursing students. Unpublished doctoral dissertation. University of Alberta, Edmonton.

Profetto-McGrath, J. (2003a). The relationship of critical thinking and critical thinking dispositions of baccalaureate nursing students. *Journal of Advanced Nursing, 43,* 569-577.

Profetto-McGrath , J. (2003b). Issues and innovations in nursing education: The relationship of critical thinking dispositions skills and critical thinking skills of baccalaureate nursing students. *Journal of Advanced Nursing, 42*(6), 569-577.

Profetto-McGrath, J., Hesketh, K.L., Lang, S., & Estabrooks, C.A. (2003). A study of critical thinking and research utilization among nurses. *Western Journal of Nursing Research, 25*(3), 322-227.

Prosser, M. and Trigwell, K. (1999). *Understanding learning and teaching: The experience in higher education.* Buckingham: The Society for Research into Higher Education and the Open University.

Rapps, J., Riegel, B., & Glasser, D. (2001). Testing a predictive model of what makes a critical thinker. *Western Journal of Nursing Research, 23*(6), 610-626.

Registered Nurses Association of Ontario. (2006). *Professional development resources and e-learning*. Toronto, ON. Retrieved on December 3, 2006, from www.rnao.org/tmkit/.

Richey, R. (1986). *The theoretical and conceptual basis of instructional theory*. London: Kogan Page.

Rodrigo, M.M. (2003). Tradition or transformation: An evaluation of ICTs in Manila schools. *Information Technology for Development, 10*(2), 95-122.

Rossignol, M. (1997). Relationship between selected discourse strategies and student critical thinking. *Journal of Nursing Education, 36*, 467-475.

Rourke, L., & Anderson, T. (2002). Using peer teams to lead online discussions. *Journal of Interactive Media in Education, 1.*

Rudd, R.D., Baker, M.T., & Hoover, T.S. (2000). Undergraduate agricultural student learning styles and critical thinking abilities: Is there a relationship? *Journal of Agricultural Education, 41*(3), 2-12.

Rudduck, J. (1996, March). *Student voices: What they can tell us as partner in change*. Paper presented at the BEMAS Annual Conference, Cambridge.

Russaw, E.H. (1997). The personally perceived problem technique: Enhancing clinical instruction. *Nurse Education, 22*(4), 36-43.

Russell, A., & Perris, K. (2003).Telementoring in community nursing: A shift from dyadic to communal models of learning and professional development. *Mentoring and Tutoring, 11*(2), 227-238.

Ryan, M., Hodson Carlton, K., & Ali, N. (1999). Evaluation of traditional classroom teaching methods versus course delivery via the World Wide Web. *Journal of Nursing Education, 38*(6), 272.

Saucier, B.L., Stevens, K.R., & Williams, G.B. (2000). Critical thinking outcomes of computer-assisted instruction versus written nursing process. *Nursing and Health Care Perspectives, 21*, 240-246.

Scheffer, B.K., & Rubenfeld, M.G. (2000). A consensus statement on critical thinking in nursing. *Journal of Nursing Education, 39,* 352-362.

Schifter, D., & Fosnot, C.T. (1993). *Reconstructing mathematics education: Stories of teachers meeting the challenge of reform.* New York: Teachers' College Press

Schlosser, C.S., & Anderson, M.L. (1994). *Distance education: Review of the literature.* Washington, DC: Association for Educational Communications & Technology.

Schon, D. (1983). *The reflective practitioner: How professionals think in action.* New York: Basic Books.

Schon, D. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions.* San Francisco: Jossey-Bass.

Schoonen, R. (2005). Generalizability of writing scores: An application of structural equation modeling. *Language Testing, 22*(1), 1-30.

Schumacher, J., & Severson, A. (1996). Building bridges for future practice: An innovative approach to foster critical thinking. *Journal of Nursing Education, 35*, 31-33.

Schunk, D. H. (1991). Self-efficacy and academic motivation. *Educational Psychologist, 26*

(3-4), 207-231.

Schwandt, T.R. (1990). Paths to inquiry in the social disciplines: Scientific, constructivistic, and critical theory methodologies. In E.G. Guba (Ed.), *The paradigm dialog* (pp. 258-276). Newbury Park, CA: Sage.

Sedlak, C.A. (1997). Critical thinking of beginning baccalaureate nursing students during the first clinical nursing course. *Journal of Nursing Education, 36*, 11-18.

Seels, B. (1989). The instructional design movement in educational technology. *Educational Technology, 29(5),* 11-15.

Shenk Pless, B., & Clayton, G.M. (1993). Clarifying the concept of critical thinking in nursing. *Journal of Nursing Education, 32,* 425-429.

Shor, I., & Friere, P. (1987). *A pedagogy for liberation: Dialogues on transforming education.* Granby, MA: Bergin and Garvin.

Siegel, H. (1988). *Educating reason: Rationality, critical thinking, and education.* New York: Routledge.

Simpson, E., & Courtney, M. (2002). Critical thinking in nursing education: Literature review. *Journal of Nursing Practice, 8,* 89-98.

Sitzia, J. & Wood, N. (1998). Response rate in patient satisfaction research: An analysis of 210 published studies. *International Journal for Quality in Health Care, 10*, 311-317.

Skinner, B.F. (1938). The *behavior of organisms: An experimental analysis.* New York: Appleton-Century-Crofts.

Smith, B., & Johnston, Y. (2002). Using structured clinical preparation to stimulate reflection and foster critical thinking. *Journal of Nursing Education, 41*, 182-189.

Snow, R.E. (1977). *The place of individual differences in instructional theory.* Educational Researcher, November.

Sorrell, J.M., Brown, H.N., Silva, M.C., & Kohlenberg, E.M. (1997). Use of writing portfolios for interdisciplinary assessment of critical thinking outcomes of nursing students. *Nursing Forum, 32*(4), 12-24.

Spears, L. A. (1996). The writing of nurse managers: A neglected area of professional communication research. *Business Communication Quarterly*, 59.

Staib, S. (2003). Teaching and measuring critical thinking. *Journal of Nursing Education, 42*(11), 498-508.

Sternberg, R. (1985). *Beyond IQ: A triarchic theory of human intelligence.* New York: Cambridge University Press.

Stoll, C. (2002). *High tech heretic: Reflections of a computer contrarian.* Boston: Doubleday.

Stone, C.A., Davidson, L.J., Evans, J.L., & Hansen, M.A. (2001). Validity evidence for using a general critical thinking test to measure students' critical thinking. *Holistic Nursing Practice, 15*(4), 65-74.

Stordeur, S., D'Hoore, W., & Vandenberghe, C. (2001). Leadership, organizational stress, and emotional exhaustion among hospital nursing staff. *Journal of Advanced Nursing*, 35(4), 533-540.

Todd, N.A. (1998). Using e-mail in an undergraduate nursing course to increase critical thinking skills. *Computers in Nursing, 16*, 115-118.

Tsui, L. (1999). Courses and instruction affecting critical thinking. *Research in Higher Education, 40*, 185-200.

Tripp, S. D., & Bichelmeyer, B. (1990). Rapid prototyping: An alternative instructional design strategy. *Educational Technology Research and Development, 28*(1), 31-44.

Troyka, L.Q. (2004). *Quick access: Reference for writers.* Scarborough, ON: Prentice-Hall Canada.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Walker, D., & Lambert, L. (1995). Learning and leading theory: A century in the making. In L. Lambert, D. Walker, D.P. Zimmerman, J.E. Cooper, M.D. Lambert, M.E. Gardner, & P.J. Ford Stack, *The constructivist leader*. New York, NY: Teachers' College Press, 1-27.

Walsh, C. M. (1996). *Critical thinking disposition in practice disciplines (nursing, education, and business) and non-practice disciplines (English, history, and psychology): An exploratory study*. College Park, MD: University of Maryland.

Watson, J. (1999). *Post modern nursing and beyond.* London: Churchill Livingstone.

Watson, G., & Glasner, E. (1980). *Watson-Glasner critical thinking appraisal manual.* New York: MacMillan.

Whiteside, C. (1997). A model for teaching critical thinking in the clinical setting. *Dimensions of Critical Care Nursing, 16*, 152-196.

Wilson, K. D. (1989). *Predictors of proficiency in critical thinking for college freshmen.* Boseman, MT: Montana State University.

Wilson, B.G. (1997). The postmodern paradigm. In C.R. Dills & A. A. Romiszowski (Eds.), *Instructional development paradigms*. Englewood Cliffs, NJ: Educational Technology Educational Technology Publications.

Wilson, B. G., & Cole, P. (1991). A review of cognitive teaching models. *Educational Technology Research and Development, 39*(4), 47-64.

Wolcott, H.F. (1994). *Transforming qualitative data: Description, analysis, and interpretation.* Thousand Oaks, CA: Sage.

Young, G. (1997). Adult development, therapy, and culture: A postmodern synthesis. New York: Plenum Press.

Appendix A: Preexperience Questionnaire

Part A

- *The California Critical Thinking Dispositions Inventory*

DIRECTIONS

- Enter your name and research ID code where indicated.
- Indicate how much you agree or disagree with each numbered statement by choosing the appropriate place on the answer grid.
- Read the two examples before you begin the survey.

EXAMPLE A: The best things in life are free.

EXAMPLE B: I'm always doing more than my share of the work.

The figure below shows the responses of someone who STRONGLY DISAGREES with EXAMPLE A and LESS STRONGLY AGREES with EXAMPLE B.

Agree strongly.....Disagree Strongly

Eg. A ○ ○ ○ ○ ○ ●

Eg. B ○ ●○ ○ ○ ○

- Begin with statement number 1 and continue through to number 75. Indicate your response on the answer grid in the place with the corresponding number.
- After you have responded to the 75 statements, fill in the information items at the end of the survey.

Enter your research ID code: ____ ____ ____ ____

1. Considering all the alternatives is a luxury I can't afford.
2. Studying new things all my life would be wonderful.
3. The best argument for an idea is how you feel about it at the moment.
4. My trouble is that I'm easily distracted.

5. It's never easy to decide between competing points of views.
6. It bothers me when people rely on weak arguments to defend good ideas.
7. The truth always depends on your point of view.
8. It concerns me that I might have biases of which I'm not aware.
9. I always focus the question before I attempt to answer it.
10. I'm proud that I can think with great precision.
11. We can never really learn the truth about most things.
12. If there are four reasons in favour and one against, I'd go with the four.
13. Men and women are equally logical.
14. Advice is worth exactly what you pay for it.
15. Most college courses are uninteresting and not worth taking.
16. Tests that require thinking, not just memorization, are better for me.
17. I can talk about my problems for hours and hours without solving anything.
18. Others admire my intellectual curiosity and inquisitiveness.
19. Even if the evidence is against me, I'll hold firm to my beliefs.
20. You are not entitled to your opinion if you are obviously mistaken.
21. I pretend to be logical, but I'm not.
22. It's easy for me to organize my thoughts.
23. Everyone always argues from their own self interest, including me.
24. Open-mindedness has limits when it comes to right and wrong.
25. It's important to me to keep careful records of my personal finances.
26. When faced with a big decision, I first seek all the information I can.
27. My peers call on me to make judgments because I decide things fairly.

28. Being open-minded means you don't know what's true and what's not.
29. Banks should make checking accounts a lot easier to understand.
30. It's important to me to understand what other people think about things.
31. I must have grounds for all my beliefs.
32. Reading is something I avoid, if possible.
33. People say I rush into decisions too quickly.
34. Required subjects in college waste time.
35. When I have to deal with something really complex, it's panic time.
36. Foreigners should study our culture instead of us always trying to understand theirs.
37. People think I procrastinate about making decisions.
38. People need reasons if they are going to disagree with another's opinion.
39. Being impartial is impossible when I'm discussing my own opinions.
40. I pride myself on coming up with creative alternatives.
41. Frankly, I am trying to be less judgmental.
42. Frequently I find myself evaluating other people's arguments.
43. I believe what I want to believe.
44. It's just not that important to keep trying to solve difficult problems.
45. I shouldn't be forced to defend my own opinions.
46. Others look to me to establish reasonable standards to apply to decisions.
47. I look forward to learning challenging things.
48. It makes a lot of sense to study what foreigners think.
49. Being inquisitive is one of my strong points.
50. I look for facts that support my views, not facts that disagree.

51. Complex problems are fun to try to figure out.

52. I take pride in my ability to understand the opinions of others.

53. Analogies are about as useful as a sailboat on a freeway.

54. You could describe me as logical.

55. I really enjoy trying to figure out how things work.

56. Others look to me to keep working on a problem when the going gets tough.

57. Getting a clear idea about the problem at hand is the first priority.

58. My opinion about controversial topics depends a lot on who I talk to last.

59. No matter what the topic, I am eager to know more about it.

60. There is no way to know whether one solution is better than another.

61. The best way to solve problems is to ask someone else for the answers.

62. Many questions are just too frightening to ask.

63. I'm known for approaching complex problems in an orderly way.

64. Being open-minded about different world views is less important than people think.

65. Learn everything you can, you never know when it could come in handy.

66. Life has taught me not to be too logical.

67. Things are as they appear to be.

68. If I have to work on a problem, I can put other things out of my mind.

69. Others look to me to decide when the problem is solved.

70. I know what I think, so why should I pretend to ponder my choices?

71. Powerful people determine the right answer.

72. It's impossible to know what standards to apply to most questions.

73. Others are entitled to their opinions, but I don't need to hear them.

74. I'm good at developing orderly plans to address complex problems.

75. To get people to agree with me I would give any reason that worked.

76. Please respond to these final items in the places provided on this page.

Prequestionnaire: Part B

- *Relevant Demographic and Profile as an Online Learner*

A Critical Look at Critical Thinking in Online Courses Taken by Nurses Pursuing BScN Standing

1. Demographic information: Please note that disclosure of this information is entirely optional.

   Age in years _____

   Gender ☐ M ☐ F

   Employment status ☐ full-time ☐ part-time ☐ not employed

   If you are employed, briefly describe your work.

2. What are your educational goals at the present time? Check off all relevant items.

   ☐ university degree
   ☐ university credits
   ☐ personal growth
   ☐ continuing education
   ☐ professional development
   ☐ career advancement
   ☐ other: specify _____

   Indicate number of years of completed university-level education at this time_____

3. Have you taken an online course or a course with online components before?

   Yes____ If you have checked Yes, how many? ____
   No ____

4. Which of the following are you currently enrolled in?

   NURS 2276 ____
   NURS 3216 ____
   SOCI 2007 ____

5. In the space provided below, describe your expectations for technical support (assistance with using the computer) during the course you checked off at Question #4.

6. In the space provided below, describe your expectations for your instructor(s) during the course you checked off at Question #4.

7. Have you used the following Internet technologies before this course?

	Yes	No
Email	_____	_____
Chat	_____	_____
Bulletin Board/	_____	_____
Discussion Board	_____	_____

8. On a scale ranging from 1 to 5 (1 being low, 5 being high), how do you rate your present competence in the noted areas?

a)	use of the computer	1	2	3	4	5
b)	use of the Internet	1	2	3	4	5
c)	keyboarding	1	2	3	4	5
d)	university-level writing	1	2	3	4	5

9. In the space provided below, describe what the term critical thinking means to you.

10. Do you think that your character or personality assists you in doing critical thinking? Please explain your response.

ONCE AGAIN, THANK YOU FOR YOUR PARTICIPATION IN THIS RESEARCH PROJECT.
PLEASE SUBMIT BY CLICKING HERE.

Appendix B: Postexperience Questionnaire

Postquestionnaire: Part A

- *The California Critical Thinking Dispositions Inventory*

DIRECTIONS

- Put your name and research ID code where indicated.
- Indicate how much you agree or disagree with each numbered statement by choosing the appropriate place on the answer grid.
- Read the two examples before you begin the survey.

EXAMPLE A: The best things in life are free.

EXAMPLE B: I'm always doing more than my share of the work.

The answer sheet shows the responses of someone who STRONGLY DISAGREES with EXAMPLE A and LESS STRONGLY AGREES with EXAMPLE B.

Agree strongly.....Disagree Strongly

Eg. A o o o o o ●

Eg. B o ●o o o o

- Begin with statement number 1 and continue through to number 75. Indicate your response on the answer grid in the place with the corresponding number.
- After you have responded to the 75 statements, fill in the information items at the end of the survey.

Enter your research ID code: ____ ____ ____ ____

1. Considering all the alternatives is a luxury I can't afford.
2. Studying new things all my life would be wonderful.
3. The best argument for an idea is how you feel about it at the moment.

4. My trouble is that I'm easily distracted.
5. It's never easy to decide between competing points of views.
6. It bothers me when people rely on weak arguments to defend good ideas.
7. The truth always depends on your point of view.
8. It concerns me that I might have biases of which I'm not aware.
9. I always focus the question before I attempt to answer it.
10. I'm proud that I can think with great precision.
11. We can never really learn the truth about most things.
12. If there are four reasons in favour and one against, I'd go with the four.
13. Men and women are equally logical.
14. Advice is worth exactly what you pay for it.
15. Most college courses are uninteresting and not worth taking.
16. Tests that require thinking, not just memorization, are better for me.
17. I can talk about my problems for hours and hours without solving anything.
18. Others admire my intellectual curiosity and inquisitiveness.
19. Even if the evidence is against me, I'll hold firm to my beliefs.
20. You are not entitled to your opinion if you are obviously mistaken.
21. I pretend to be logical, but I'm not.
22. It's easy for me to organize my thoughts.
23. Everyone always argues from their own self interest, including me.
24. Open-mindedness has limits when it comes to right and wrong.
25. It's important to me to keep careful records of my personal finances.
26. When faced with a big decision, I first seek all the information I can.

27. My peers call on me to make judgments because I decide things fairly.
28. Being open-minded means you don't know what's true and what's not.
29. Banks should make checking accounts a lot easier to understand.
30. It's important to me to understand what other people think about things.
31. I must have grounds for all my beliefs.
32. Reading is something I avoid, if possible.
33. People say I rush into decisions too quickly.
34. Required subjects in college waste time.
35. When I have to deal with something really complex, it's panic time.
36. Foreigners should study our culture instead of us always trying to understand theirs.
37. People think I procrastinate about making decisions.
38. People need reasons if they are going to disagree with another's opinion.
39. Being impartial is impossible when I'm discussing my own opinions.
40. I pride myself on coming up with creative alternatives.
41. Frankly, I am trying to be less judgmental.
42. Frequently I find myself evaluating other people's arguments.
43. I believe what I want to believe.
44. It's just not that important to keep trying to solve difficult problems.
45. I shouldn't be forced to defend my own opinions.
46. Others look to me to establish reasonable standards to apply to decisions.
47. I look forward to learning challenging things.
48. It makes a lot of sense to study what foreigners think.
49. Being inquisitive is one of my strong points.

50. I look for facts that support my views, not facts that disagree.

51. Complex problems are fun to try to figure out.

52. I take pride in my ability to understand the opinions of others.

53. Analogies are about as useful as a sailboat on a freeway.

54. You could describe me as logical.

55. I really enjoy trying to figure out how things work.

56. Others look to me to keep working on a problem when the going gets tough.

57. Getting a clear idea about the problem at hand is the first priority.

58. My opinion about controversial topics depends a lot on who I talk to last.

59. No matter what the topic, I am eager to know more about it.

60. There is no way to know whether one solution is better than another.

61. The best way to solve problems is to ask someone else for the answers.

62. Many questions are just too frightening to ask.

63. I'm known for approaching complex problems in an orderly way.

64. Being open-minded about different world views is less important than people think.

65. Learn everything you can, you never know when it could come in handy.

66. Life has taught me not to be too logical.

67. Things are as they appear to be.

68. If I have to work on a problem, I can put other things out of my mind.

69. Others look to me to decide when the problem is solved.

70. I know what I think, so why should I pretend to ponder my choices?

71. Powerful people determine the right answer.

72. It's impossible to know what standards to apply to most questions.

73. Others are entitled to their opinions, but I don't need to hear them.

74. I'm good at developing orderly plans to address complex problems.

75. To get people to agree with me I would give any reason that worked.

Postquestionnaire: Part B

- *Your Profile as a Learner*

A Critical Look at Critical Thinking in Online Courses Taken by Nurses Pursuing BScN Standing

Postquestionnaire: Part B

2. Now that you have completed your course, have your educational goals changed?

   Yes ☐ No ☐

   If your goals have changed, please explain. If your goals have not changed, go ahead to Question #2.

2. Assuming that you used the technical supports available to you for this course, were they effective?

   Yes ☐ No ☐ N/A ☐

   Explain your answer.

3. Please describe any technical problems/difficulties you experienced. If you did not experience technical difficulties of any kind, proceed to Question #4. If you did experience difficulties, explain how you managed them.

4. On a scale ranging from 1 to 5 (one being low, 5 being high), how do you rate your present competence in the noted areas?

a)	use of the computer	1	2	3	4	5
b)	use of the Internet	1	2	3	4	5
c)	keyboarding	1	2	3	4	5
d)	university-level writing	1	2	3	4	5

5. Using the scale below, choose the number that best reflects your perception of the effectiveness of each item or person in assisting you as a critical thinker in your course. 1 means you found the item or person to be very effective; 5 means you found the item or person to be minimally effective.

a)	email	1	2	3	4	5
b)	bulletin board/discussion board	1	2	3	4	5
c)	other learners	1	2	3	4	5
d)	the instructor(s)	1	2	3	4	5
e)	the course content	1	2	3	4	5
f)	the assignments	1	2	3	4	5
g)	other components of the course (please specify)	1	2	3	4	5

6. Do you think this course has enhanced or increased your dispositions towards the practice of critical thinking?

Yes ____
No ____

7. Because of the course, do you believe you are doing higher level critical thinking in your work setting than before the course?

Yes ____
No ____
N/A ____

8. In your opinion, how might online courses and course with online components be designed and delivered so that they enhance a learner's dispositions towards critical thinking?

ONCE AGAIN, THANK YOU FOR YOUR PARTICIPATION IN THIS RESEARCH PROJECT.

PLEASE SUBMIT BY CLICKING HERE.

Appendix C: Course Outline for Post-RN Nurses Including Bulletin Board Assignments

NURS 2276

NURSING HEALTHY INDIVIDUALS
AND FAMILIES

ASSIGNMENT SCHEDULE

ASSIGNMENT	VALUE	DUE DATE
CLINICAL PRACTICE 4 Family Visits: Assessment and Teaching Session	Pass/Fail	_____
THEORY		
Analysis of a Helping Relationship	20%	February 11, 2005
Family Assessment: Application of a Model	30%	March 11, 2005
Family Teaching	30%	March 25, 2005
Two Bulletin Board Postings: 1. Reflective Practice 2. Critical Thinking	10% each for a total of 20%	

Appendix C Con't

CLINICAL PRACTICE — FAMILY VISITS

Family visits are part of your clinical work and will be graded as Pass/Fail based on your objectives for the visits, the actual visits, and how they were conducted.

Working with a "healthy" family in the community, you are required to demonstrate the ability to:

- analyze communication skills used in the second interview.
- acquire data about family structure, development, and functioning through family interviews.
- analyze the data to identify family strengths and limitations.

The Process:

1. Obtain the agreement of the family (of at least two members and preferably three) to make four visits. Be sure that the family understands that you will visit in the role of a student—that you will not provide service. Assure them of confidentiality and ensure that the Letter of Consent (sample follows) is signed at the beginning of your first visit. Submit this as an appendix of the Family Assessment Assignment.
2. Give the name, address, and telephone number of the family to your clinical advisor.
3. The home visits should be approximately an hour long.
4. Before making your first visit, plan your family assessment guidelines, referring to the unit on Family Assessment. You will want to make a few notes to yourself to help you recall various sections to focus on during the interview.
5. Develop written objectives for each of your visits. Use the guidelines to decide the areas to focus on.
6. Give your objectives for each visit to your assigned advisor for reviewing and feedback. Make sure you have the feedback prior to attending the proposed visit.

Confidentiality is of utmost importance. Do not use family names when discussing the family. Do not write identifying information (name, address, etc.) with any of the data; instead, use initials and pseudonyms.

Faculty Advisor Role

In the first weeks of the course, each of you will be assigned a Faculty Advisor with whom you will work to organize and manage your clinical practice, namely, the family visits.

Their role is to act as support when you are writing objectives, dealing with problems in assignment completion, and sorting through the expectations of the course.

The Faculty Advisor will:

- review the student's objectives with him/her prior to each visit
- assist the student with reviewing and sorting through data collection and setting priorities for family learning
- discuss with the student the appropriateness of the wellness topic for the teaching visit
- review the teaching plan with the student
- monitor the family situation to ensure student's interventions remain focused on health-related needs

Grading of Clinical Practice:

Family Visits Pass/Fail

Appendix C Con't

SAMPLE OF LETTER SENT TO FAMILY

Dear _____

Thank you for agreeing to have a student visit your family. The student who will be visiting you is a Registered Nurse who is currently working on her Bachelor of Science in Nursing with Laurentian University.

The student _____ will contact you by telephone to arrange a time that is convenient for both of you for the visit. The student will make four home visits. These visits will be approximately one hour in length. In order to assist the student in evaluating his/her ability to conduct an interview in the home with a family, it is necessary to audio-tape one of the visits. Only the student and the course professor will listen to the tape. Your name will not be included in any written communication. Confidentiality will be maintained.

The purpose of this learning experience is to help the student further develop skills in communicating with and assessing a "healthy" family in a home setting.

Thank you again for contributing to our educational program. If you have any questions, please do not hesitate to contact me by phoning _____.

Sincerely,

Course Professor

Appendix C Con't

CONSENT FOR FAMILY INTERVIEW

We agree to have _____ visit with our family on four occasions for the purpose of obtaining information for a family assessment. We understand that one interview will be audio-taped. We understand that the material will be kept confidential and will be used by the student and course Professor for educational purposes only. After it is heard, the tape will be erased.

SIGNATURES

All Adults: _____

_____

_____

_____

Student: _____

Date: _____

Appendix C Con't

ASSIGNMENT #1

Analysis of a Helping Relationship

The purpose of this assignment is for you to demonstrate understanding of intentional caring abilities as expressed within a therapeutic relationship. The learner is expected to demonstrate this through an audio-tape of the second Family Visit.

Select a five minute excerpt of the audio-tape that you will evaluate using Johns' model. Provide a written transcript, which is to be handed in as an appendix to the assignment. Discuss the congruency between your intention and what happened on the tape. Considering that nursing is a profession based on Standards of Competency and self-regulation. As such, this assignment provides you with an opportunity to demonstrate your image of nursing.

Length of paper: 4 pages maximum, not including appendix. Cite all references using APA, 5th edition.

The audiotape must be submitted with the paper when it is handed in.

Marking Scheme

Description of What Happened (6 marks)
Describe from your point of view what transpired.
Include all the factors contributing to the experience and the context of the situation.

Perception (10 marks)
In your efforts to demonstrate your plan of inter-relational care, comment on your thinking process.
What were your actions to support such ideas?
What were the consequences of your actions for yourself? the client? the family?
How did you know the client's/family's perception?

Influencing Factors (6 marks)
What ways of knowing guided your thinking in the situation?
What is unique to this situation with respect to the context?

Alternative Perspectives (12 marks)
Considering this experience, what knowledge have you gained from the use of both therapeutic and non-therapeutic communication?
What would you have done differently? Be specific.

Praxis (6 marks)
How has this experience changed your ways of knowing?
How will it change your nursing practice? Total: 40 (1/2=20%)

Appendix C Con't

ASSIGNMENT #2

Family Assessment – Application of a Model

Select a family assessment model or framework to complete an assessment of the family. This paper is a report and analysis of the data collected during the first two family visits. Your paper should include the following:

Framework

1. A framework or model of the structural, developmental, and functional components of the family. Use literature to support your framework.

10 marks

Data C2. Raw data collected. Identify categories where more data are needed and indicate the specific data needed (raw data should be included as an appendix).

2. Raw data collected. Identify categories where more data are needed and indicate the specific 20 marks data needed (raw data should be included as an appendix).

20 marks

Analysis

3. Analysis and synthesis of the data to identify:
   a) The family's developmental stage based on theory and supported by data 5 marks

   b) Family strengths 15 marks

   c) Actual, potential, possible diagnoses 10 marks

TOTAL 60

Demonstration of critical thinking and use of the nursing literature to support decision-making and interventions will be considered in the evaluation of this assignment.

Page Length: Maximum 10 pages, typed, double-spaced. Cite all references using APA, 5th edition.

Appendix C Con't

ASSIGNMENT #3

Family Teaching Assignment

Based on the priority diagnosis determined by your family assessment (Assignment #2), you are required to prepare and initiate a teaching session with the family. This will occur on the third family visit.

The fourth family visit will include evaluation of the teaching and closure of the therapeutic relationship.

This assignment is designed to allow you to demonstrate achievement of the objectives of the unit on teaching and learning.

Using the following sample as a guide, create an outline for your assignment:

Learner Objectives	Teaching Strategies	Rationale and Theory	Evaluation

1. Make sure that objectives are measurable and relate to the identified learning need via the priority diagnosis.

2. Outline your teaching strategies (teacher and learner activities) for each of your objectives.

3. Support your choices with teaching and learning principles and evidence from the literature. Include an outline of the content to be taught.

4. Outline your proposed method of evaluating the teaching and learning process. Include any evaluation tools or questions you may use at the final visit with the family.

Marking Scheme

Identification of learning needs and objectives	10 marks
Identification of teacher and learner activities	20 marks
Use of theory and evidence-based practice	20 marks
Evaluation of the teaching process	10 marks

TOTAL MARKS 60

Page Length: Maximum 10 pages, typed, double-spaced not including appendices. Cite all references using APA, 5th edition.

Appendix C Con't

ASSIGNMENT #4

The student will complete two Bulletin Board postings: one each on Reflective Practice and Critical Thinking.

Postings will be evaluated on the basis of their content as well as references to nursing evidence-based practice literature.

Be sure to type For Marks in the subject line to indicate that this is your Assignment #4 to be marked.

Posting #1 – Reflective Practice

Referring to the course concepts in the syllabus, select one and write a reflective bulletin. This should be from a clinical experience you have had relating to the concept (e.g., an experience in which you feel caring was demonstrated).

Refer to the marking scheme on the following page in order to guide your writing for this piece.

Appendix C Con't

Bulletin Board Posting #1: Reflective Practice

ASSESSMENT OF CONTENT	MARKING SCHEME
1.0 Description of Experience 1.1 Phenomenon: Describe and define the main concept found in your journals 1.2 Causal: What essential factors contributed to your growth within this concept? 1.3 Context: What are the significant background factors to your growth within this concept? 1.4 Clarifying: What are the clarifying processes that relate to your growth with this concept?	7
2.0 Reflection 2.1 What was I trying to achieve? 2.2 Why did I intervene as I did? 2.3 What were the consequences of my actions for: myself? the client/family/others? for the people I work with? 2.4 How did I perceive this experience when it was happening? 2.5 How did the client/family/others perceive it? 2.6 How did I know the others' perception(s)?	8
3.0 Influencing Factors 3.1 What internal factors influenced my decision making related to the concept? 3.2 What external factors influenced my decision making? 3.3 What sources of knowledge did/should have influenced my decision making?	5
4.0 Dealing with the Situation 4.1 Could I have dealt better with the situation? 4.2 What other choices did I have? 4.3 What would be the consequences of these choices?	3
5.0 Learning 5.1 How do I now perceive this experience? 5.2 How have I made sense of this experience in light of past experiences and future experiences? 5.3 How has this experience changed my ways of knowing? (DEFINE AND USE ALL 4 WAYS OF KNOWING: personal, empirical, aesthetic, and ethical) HOW DOES THIS AFFECT ME AS A NURSE?	7
TOTAL GRADE – to be divided by 3 for 10%	/30

Appendix C Con't

Bulletin Board Posting #2: Critical Thinking

After reading the case study that follows, demonstrate your process of critical thinking in answering the provided questions. This is to be done in a narrative fashion, not in point form.

Marking Scheme

1.	What actual data or information do I have about this case?	5 marks
2.	What other data do I need to better understand this situation?	5 marks
3.	What are my provisional hypotheses (problem or need statements)?	5 marks
4.	What learning issues have I identified in this case (i.e., may have to review in the professional literature).	5 marks
	TOTAL	20 marks

CASE STUDY: Postpartum/Infant/Toddler/Generative Family

You are a community health nurse whose job duties include postpartum home visitation of clients after early discharge from the hospital. Your identified clients for this morning's visits are Jennifer and her newborn son, Carl. You will be visiting the family twice, today for the two-day postpartum visit, and again a week from today.

Family Information:

- Jennifer: 19 years old, P2G2. She did not complete highschool. Jennifer is employed as a waitress at a local restaurant. Her primary language is English. She smokes a half a pack of cigarettes a day.
- Melissa: 18 months old and has become a fussy eater lately, refusing milk. Jennifer has been giving her what she wants – apple juice. Melissa is in the 80th percentile for height and is in the 50th percentile for weight for her age group.
- Carl: 2 days old, weighs 6 lbs.; he is on formula.
- Joe: Jennifer's boyfriend. He is 19 years old and works in construction. It is November, and he will be laid off soon for the winter. He has a grade 12 education and his primary language is French.
- The family live in a two bedroom mobile home just outside town. The family pets are a Siamese cat and a Husky dog. They drive a 1984 Ford Mustang.

Medical Information:

Jennifer began receiving prenatal care in the first trimester of her pregnancy. She missed five appointments because she had no transportation. Her identified medical problems during pregnancy include anaemia and insufficient weight gain. Total weight gain for this pregnancy was 17 pounds. Jennifer's labour was 18 hours long and was uncomplicated. She suffered a third degree laceration during parturition.

Appendix D: Assignment: Comparison Group #1

Prepare a seven to eight doublespaced typed page critical literature review on a nursing-related topic of your choice. In your assignment, group similarly-focussed articles together. Be sure to identify gaps and limitations in the studies.

Standard use of English and APA citing and referencing practices are required.

Appendix E: Assignment File: Comparison Group #2

General Instructions for Assignments

There are two online quizzes, five Bulletin Board postings, one assignment, and a final exam for SOCI 2007EL 12. Before doing anything else, quickly look over this handout, noting certain points:

* The online quizzes are multiple choice format. Quiz 1 covers Modules One and Two and Quiz 2 covers Modules Three and Four. Each quiz has sixty items from the Arnett text. Each online quiz is available for a limited time only, ending at 11:55 p.m. on the last day of availability. Pay close attention to the Assignment Schedule for the dates of availability for each quiz. You are allowed one attempt (lasting four hours) for each quiz.

* When you have completed an assignment, prepare an assignment cover sheet and make a copy of your work for yourself. Make a final check that everything is complete and in order. Make sure that the assignment sheet is on top. Put everything in one of the large, preaddressed envelopes provided in your course package and mail the envelope.

* When the assignment is returned, give some thought to the comments and contact your course supervisor if you have any questions.

Bulletin Board Postings

* You must post answers for Learning Activities 1.3, 2.1, 3.2, 3.8, and 4.4.

* Throughout the course, feel free to use the Bulletin Board for posting questions and comments.

General Information on the Final Exam

* The final exam is based on Modules One through Four.

* The exam consists of short-answer and essay questions. In each case, you will have choices. The short-answer questions ask you to define certain concepts/people and state their importance for sociology of youth. The essays are longer versions of short answers. They also require defining and often comparing/contrasting the main reading from the course. They should have introductions, conclusions, and a body with sound arguments and reference to course material. You can prepare for the final exam by reading all the material in the online course material, the additional readings, the Schissel reader, and by completing all Learning Activities.

* The Learning Activities will function as sources of exam questions.

Assignment 1
Term Paper: Critical Biography

As you progress through the readings for the course, keep in mind that you are required to write a critical biography of an adolescent or an autobiography of your own adolescence. This can be about you (auto-biographical) or an imaginary/someone else (biography). It is strongly recommended that you begin writing early in the course as your developing biography or autobiography is related to course content.

Your critical biography consists of telling the story of an adolescent. This process includes placing your adolescent in historical and cultural contexts. You may write about yourself as an adolescent or about someone else you know. Or, you may create a fictional character. Your character may be from any epoch of history, the present, or the future. Placed in a setting and specific cultural context, the adolescent in your assignment should meet the challenges and opportunities defined by his or her setting and cultural context. Think about social class issues and social policy that affects your character. The course will help you define how your character relates to family, peers, media, and historical time.

Your character must assume an identity. The readings will help you understand adolescence as a time in the life journey during which gender, ethnic, and developmental issues help forge identity. Given the identity that your character is striving toward, he or she should attempt to adapt to social-contextual challenges and move into adulthood. Present or outline this process in your document. Address the problems and challenges that typically face young people.

Keep in mind that the elements of a simple narrative are as follows:

setting	context and social world
plot	trajectories, pathways
characters	individual identities and social relationships
problems and resolutions	challenges and solutions encountered by the characters

Your critical biography is to be no more than eight pages, typed and double spaced. Use the course readings to give credence to both your character and story. Reference and refer to at least one of the readings from each module in this assignment. Reference all sources by including a reference list on a separate sheet at the end of your paper. See the referencing guidelines below.

How to Reference Materials for the Critical Biography (and in Sociology more generally)

1. Include author's last name and year of publication (e.g., Smith, 1987).

2. Include page number when directly quoting an author (e.g., Smith, 1987, p. 125).

3. a) Always include a reference when you are citing factual information or ideas presented in readings. If you do not credit your sources, you are committing the academic offence of plagiarism.

   b) Always support arguments you are making with references to relevant literature, i.e., cite last names(s) of author(s) and year of publication for sources which lend support to your argument.

4. Include only the author's last name and year of publication (a page number, however, is necessary for a direct quotation) when citing references in the body of your essay. Other information such as author's given name or first initial, title, editor(s), issue number, publisher, etc., should be included in your references section at the end of your essay.

5. Avoid using two referencing styles. Be consistent and use one style only, preferably the one which is used in the text (APA style).

6. To be consistent with this style, when you cite two or more authors who have said essentially the same thing, enclose all authors, in alphabetical order, in one set of brackets and separate with semi-colons; e.g., (Jones, 1987; Smith, 1986; Towne, 1985).

7. As previously suggested, list all references in a separate section at the end of your essay. Also, be sure to clarify the source of each reference. When you are citing a source which you have not directly read, make this clear. For example, if the source you read was Smith, who cited a finding by Brown, you should use one of the following methods

   a) Smith (1984) has cited the findings of Brown's (1978) study on male delinquency indicating .....

   b) Brown (1978), as cited by Smith (1984), has suggested that ....

   c) Brown (1978), has stated that .....(cited in Smith, 1984).

7. Always cite the chapter author, not the editor(s) or title of the text, in your essay. For example, think about a text in which each chapter is written by a different author. In the body of your essay, you must cite the chapter author. In your references section at the end of the essay, list your sources in alphabetical order, according to authors' last names. Then, include the editor's name(s) in this list as indicated in the following example:

   Dreidger, L. (1986). Ethnic and minority relations. In R. Hagedorn (Ed.), *Sociology* (pp. 273-303). Toronto: Holt, Rinehart and Winston Ltd.

9. The first time you cite a reading which has more than two authors include all authors' names. Thereafter, you may use the name of the first author listed and "et al." For example, the first time you would cite (Jones, Moore & Smith, 1987). Thereafter, you would cite (Jones et al., 1987). If there are only two authors, always cite both names.

10. References to authors made within the body of the essay are part of the sentence structure. Therefore, do not place a period before and after the reference but rather only after the reference, e.g., The relationship between social class and educational attainment has been clearly documented (Smith, 1986).

Appendix F: Holistic Critical Thinking Scoring Rubric

Holistic Critical Thinking Scoring Rubric	
4	Consistently does all or almost all of the following: Accurately interprets evidence, statements, graphics, questions, etc. Identifies the salient arguments (reasons and claims) pro and con. Thoughtfully analyses and evaluates major alternative points of view. Draws warranted, judicious, non-fallacious conclusions. Justifies key results and procedures, explains assumptions and reasons. Fair-mindedly follows where evidence and reasons lead.
3	Does most or many of the following: Accurately interprets evidence, statements, graphics, questions, etc. Identifies relevant arguments (reasons and claims) pro and con. Offers analyses and evaluations of obvious alternative points of view. Draws warranted, non-fallacious conclusions. Justifies some results or procedures, explains reasons. Fair-mindedly follows where evidence and reasons lead.
2	Does most or many of the following: Misinterprets evidence, statements, graphics, questions, etc. Fails to identify strong, relevant counter-arguments. Ignores or superficially evaluates obvious alternative points of view. Draws unwarranted or fallacious conclusions. Justifies few results or procedures, seldom explains reasons. Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.
1	Consistently does all or almost all of the following: Offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others. Fails to identify or hastily dismisses strong, relevant counter-arguments. Ignores or superficially evaluates obvious alternative points of view. Argues using fallacious or irrelevant reasons, and unwarranted claims. Does not justify results or procedures, nor explain reasons.

Regardless of the evidence or reasons, maintains or defends views
based on self-interest or preconceptions.
Exhibits close-mindedness or hostility to reason.

Appendix G: Interview Sessions

Questions for Students

Why are you taking your post-RN degree at this time?

Why are you taking the post-RN program through Laurentian University?

What special challenges did you experience because this was an online course?

Do you think the course has increased your dispositions towards the practice of critical thinking?

What are your thoughts about the bulletin board and how it supported your learning?

Tell me about your experience of academic writing in the course.

What changes would you recommend to online courses based on your experience in this course?

Questions for Instructors

Can you tell me a little about yourself as a nurse and a teacher?

How would you describe your students in this course?

Do you think the course helped your students as critical thinkers?

Do you think you saw a connection between critical thinking and writing in the course?

Tell me about academic writing in the course.

How do you see the instructor's role in moderating the bulletin board?

What changes would you make to increase bulletin board participation?

Aside from the bulletin board, did you interact with your students in any other way?

POTENTIAL RISKS AND DISCOMFORTS

There are no known and/or anticipated risks inherent in this study. The researcher is not in any way involved in the delivery of your course not does she have access to your grades.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

There are a number of potential personal and professional benefits associated with participating in this study. They include the following:

- Because, at the end of the study, you will receive information about your personal dispositions towards critical thinking, you will have new understanding of your possible strengths and weaknesses in this area. In turn, you may choose to focus on stengthening certain dispositions and/or compensating for others.

- Acquisition of the above information is helpful in career planning.

It is also suggested that, as a student who is required to read scholarly research and possibly do research of your own, you will learn about the research process as it occurs in a university setting.

Speaking more generally, the findings of this study will help universities to design and develop online courses that enhance the critical thinking dispositions of the students who take them.

PAYMENT FOR PARTICIPATION

There are no costs or payments associated with this project.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential. Such information will be disclosed only with your permission.

The following steps will be taken to ensure confidentiality:

- ✓ If you decide to participate, you will be assigned an ID number to be used on both of your surveys.
- ✓ Identifying information will be removed from your written work. Your written work will be assigned the same research ID number as used for the two surveys.
- ✓ If you choose to participate in an interview or focus group session, you have the right to

hear the resulting tape before it is analyzed by the researcher. The only person who will have access to the tape will be the researcher; access will not be provided to your instructor(s). The tape will be erased after the researcher has successfully completed her thesis defence.

- ✓ The only purposes for which the above data will be used are educational: specifically, this includes the researcher's doctoral thesis work and related peer-reviewed scholarly articles.

PARTICIPATION AND WITHDRAWAL

It is entirely your personal decision to participate in this study or not.

Similarly, if you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not wish to answer and still remain in the study.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

After successful completion of her thesis defense, the researcher will be happy to forward you a copy of your personal data as well as an executive summary of the project as a whole. This material will be mailed to you at no cost.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty.

This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Coordinator
University of Windsor
Windsor, Ontario
N9B 3P4

Telephone: 519-253-3000, ext. 3916
E-mail: lbunn@uwindsor.ca

SIGNATURE OF RESEARCH SUBJECT

I understand the information provided for the study A Critical Look at Critical Thinking in Online Nursing Education as described herein. My questions have been answered to my satisfaction and I agree to participate in this study. I have been given a copy of this form.

_____

Name of Subject (please print)

_____ _____

Signature of Subject Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____

Signature of Investigator Date

POTENTIAL RISKS AND DISCOMFORTS

There are no known and/or anticipated risks inherent in this study. The researcher is not in any way involved in the delivery of your course not does she have access to your grades.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

There are a number of potential personal and professional benefits associated with participating in this study. They include the following:

- Because, at the end of the study, you will receive information about your personal dispositions towards critical thinking, you will have new understanding of your possible strengths and weaknesses in this area. In turn, you may choose to focus on stengthening certain dispositions and/or compensating for others.

- Acquisition of the above information is helpful in career planning.

It is also suggested that, as a student who is required to read scholarly research and possibly do research of your own, you will learn about the research process as it occurs in a university setting.

Speaking more generally, the findings of this study will help colleges and universities design and develop online courses that enhance the critical thinking dispositions of the students who take them.

PAYMENT FOR PARTICIPATION

There are no costs or payments associated with this project.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential. Such information will be disclosed only with your permission.

The following steps will be taken to ensure confidentiality:

- ✓ If you decide to participate, you will be assigned an ID number to be used on both of your surveys.
- ✓ Identifying information will be removed from your written work. Your written work will be assigned the same research ID number as used for the two surveys.
- ✓ If you choose to participate in an interview or focus group session, you have the right to view the tape before it is analyzed by the researcher. The only person who will have access to the tape will be the researcher; access will not be provided to your instructor(s). The tape will be erased after the researcher has successfully completed her thesis defence.
- ✓ The only purposes for which the above data will be used are educational: specifically, this includes the researcher's doctoral thesis work and related peer reviewed scholarly articles.

PARTICIPATION AND WITHDRAWAL

It is entirely your personal decision to participate in this study or not.

Similarly, if you volunteer to partake in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not wish to answer and still remain in the study.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

After successful completion of her thesis defense, the researcher will be happy to forward you a copy of your personal data as well as an executive summary of the project as a whole. This material will be mailed to you at no cost.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Coordinator
University of Windsor
Windsor, Ontario N9B 3P4

Telephone: 519-253-3000, ext. 3916
E-mail: lbunn@uwindsor.ca

Appendix I Con't

SIGNATURE OF RESEARCH SUBJECT

I understand and the information provided for the study A Critical Look at Critical Thinking in Online Nursing Education as described herein. My questions have been answered to my satisfaction and I agree to participate in this study. I have been given a copy of this form.

_____

Name of Subject (please print)

_____ _____

Signature of Subject Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____

Signature of Investigator Date

Appendix J: Four Ways of Knowing (Johns, 1995)

Aesthetics	· 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	· How did I feel in this situation? · What internal factors were influencing me?
Ethics	· How did my actions match with my beliefs? · What factors made me act in an incongruent way?
Empirics	· How knowledge did or should have informed me?

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

Below are elaborations of the four ways of knowing as they might occur in a nursing education context:

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. This kind of thinking also tends to focus on the feelings of others and the experience of consequence.

A statement such as "I am much more comfortable discussing these things 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!)" suggests self-analysis as the nurse reflects on why she responded as she did. Other examples of aesthetic thinking include statements dealing with consequence: this sense of consequence often related both to the patient and the nurse,"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." On the other hand, the following statement places the nurse 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."

Aesthetic knowing is also said to involve consideration of how the other person is feeling. This is reflected by statements such as "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

While similar to aesthetic knowing with a focus on feeling, personal knowing is almost always about the self and is often an attempt to answer questions such as "How did I feel in this situation?" and "What internal factors influenced my behaviour?" For example, the following comment is clearly about one nurse's sense of self in relation to a clinical situation with 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.

Ethical Knowing

Ethical knowing deals with the issue of congruence between a nurse's actions as a professional and his or her personal value system. It is about wrestling with questions such as "How did my actions match with my beliefs?" and "What factors made me act in ways that do not fit with my values?" An example of this kind 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, a person's choice to refuse blood transfusions.

A second example of a nurse in a situation involving ethical knowing is described below: "Do you think this is ethical practice (kissing foreheads to assess temperature) or it is 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 passage, one nurse's personal values and practices require special thinking about given the ethical rights of another person within the context of a professional relationship.

Empirical Knowing

In a situation of empirical knowing, the nurse considers how nursing knowledge informed (or should have informed) practice.

Appendix K: Information Document: Laurentian University's BScN Program for Registered Nurses via Distance Education, 5th Intake

THE NURSING PROGRAM

The School of Nursing opened in 1967 and admitted students to a four-year program leading to the degree of Bachelor of Science in Nursing (BScN). Registered nurse students were first admitted to the program in 1975. Students may study on a full-time or part-time basis.

DISTANCE EDUCATION

In January 1987, the BScN program for registered nurses became available on a part-time basis through Distance Education at five sites. As the demand increased, the number of sites expanded from Barrie, Orillia, North Bay, Timmins and Sault Ste. Marie to include students in Oshawa, Owen Sound, St. Catharines, Toronto, Muskoka/Parry Sound, Kitchener/Guelph, Simcoe, Kirkland Lake/Englehart/Haileybury, Attawapiskat, and Sudbury.

THE CURRICULUM FOR REGISTERED NURSES

The curriculum combines courses from the Humanities, Sciences, Social Sciences, and Nursing. Nursing is studied in increasing intensity throughout the program. In the courses NURS 2276, NURS 2286, and NURS 2296, the emphasis is on health and normality. Students further develop their nursing process, interpersonal, and physical examination skills that are required to assess individuals and families. NURS 3316 introduces students to Epidemiology and Biostatistics. NURS 3317 explores major contemporary issues affecting nursing and health care. The four 4000 level nursing courses provide opportunities for the student to pursue individual clinical interests, to test nursing theory, to apply aspects of the research process, and to function in a leadership role in a chosen clinical field.

ADMISSION REQUIREMENT

Registered nurses are required to submit their current Certificate of Registration from the College of Nurses of Ontario or be eligible for registration with the College of Nurses of Ontario.

PROGRAM OF STUDY

Required Non-Nursing Courses

*CHMI 2220 E	- Clinical Chemistry
BIOL 2110 E	- Medical Microbiology

*Students who do not have grade 13 Chemistry, or equivalent, or who took grade 13 Chemistry or equivalent over 5 years ago, are required to take CHMI 1401, CHMI 1031, or to consult with the Chemistry Department before taking the required Chemistry courses.

NOTE: CHMI 1041 or CHMI 1031, if taken, may be used as an elective.

Electives

12 credits of electives

Nursing Courses

Nursing 2276 E – Nursing Healthy Individuals and Families
*** Nursing 2286 E – Nursing Health Assessment
*** Nursing 2296 E – Community Health Nursing

*** Nursing 3316 E – Epidemiology and Biostatistics
*** Nursing 3317 E – Issues and Directions in Nursing and Health Care

Nursing 4005 E – Theoretical Basis for Nursing Practice
Nursing 4015 E – Nursing Research
Nursing 4025 E – Critical Analysis of a Nursing Field
Nursing 4035 E – Leadership Skills in Nursing Practice

Total number of credits in the program: 63

*** A student may apply to challenge NURS 2286, 2296, 3316 and 3317 if they are able to demonstrate appropriate educational and experiential background.

COURSE DESCRIPTIONS

NURS 2276 E Nursing Healthy Individuals and Families
Course content includes the nursing process, group dynamics, teaching and learning, family assessment, growth and development and therapeutic communication. Students practice in the community with individuals. This course is open to Post R.N. students only. (lec 2, tut 2) cr 3

NURS 2286 E Nursing Health Assessment
Course content includes the physical and psychological assessment of the individual. Skill development in the area of interviewing and history taking are learned. Students practice in the laboratory setting. Prerequisite: NURS 2276. This course is open to Post R.N. students only. (lec 2, lab 2) cr 3

NURS 2296 E Community Health Nursing
Course content includes concepts of health behaviour, health promotion, illness prevention, community health nursing and community organization. Students work with families and groups in the community. Prerequisite: NURS 2276. Corequisite: NURS 2286. This course is open to Post R.N. students only. (lec 2, tut 2, total clin 24) cr 3

NURS 3316 E Epidemiology and Biostatistics
Introduction to Epidemiology and Biostatistics including basic study designs, measurements and sources and data. Issues in methodology include sources of variation, common biases,

compliance, contamination, cointervention and reproductibility. Methods of analyzing data are introduced and applied to nursing and health care. (lec 3) cr 3

NURS 3317 E Issues and Directions in Nursing and Health Care
This course is an exploration and critical analysis of major contemporary issues affecting nursing and the health care system. Included in the analysis will be: exploration of historical background, government documents and briefs, current research and ethical and legal implications of various approaches to these issues. (lec 3) cr 3

NURS 4005 E Theoretical Basis for Nursing Practice
A combined theory and practice course. Students examine a number of conceptual/theoretical nursing frameworks. The course focuses on identifying appropriate criteria for evaluating the frameworks. Students practice in a selected clinical setting and apply and analyze various frameworks while developing nursing skills required to function in that area. Prerequisites: NURS 2276, 2296. This course is given in one term. (lec 3, total clin 108) cr 6

NURS 4015 E Nursing Research
The students will develop an understanding of the purpose of research for nursing practice. Students will examine the two major research paradigms and the components of the research process. They will develop skills in the critical appraisal of nursing research. These skills will assist them in their role as research consumers and enhance their evidence-based practice. Students will practice in a selected clinical setting, demonstrating research-mindedness while developing nursing skills to function in that area. Prerequisite: NURS 3316. This course is given in one term. (lec 3, total clin 108) cr 6

NURS 4025 E Critical Analysis of a Nursing Field
A combined theory and practice course. The focus is on the analysis of a nursing setting. Course content includes organizational structure/systems analysis, change and decision making theory and skill development in communication and colleague relationship. Students practice in a selected clinical setting and identify organizational concepts and develop nursing skills required to function in that area. Prerequisites: NURS 2276, 2296. This course is given in one term. (lec 3, total clin 108) cr 6

NURS 4035 E Leadership Skills in Nursing Practice
A combined theory and practice course. The focus is on leadership as a situation-specific process. Course content includes theories of leadership, administration, quality assurance/risk management, adult education and program implementation. Students practice in a selected clinical setting and apply leadership principles and develop nursing skills required to function in that area. Prerequisites: NURS 2276, 2296. This course is given in one term. (lec 2, total clin 124) cr 6

CHMI 2220 E Clinical Chemistry
A course designed for students in Nursing to provide an understanding of the relationship between disease, the underlying biochemical causes and the methodology for diagnosis. Prerequisites: CHMI 1041, CHMI 1031, OAC or equivalent. (lec 3, lab/tut 3) cr 6

BIOL 2210 E Medical Microbiology
This course consists of an introduction of microorganisms, the principles of medical microbiology, basic immunology, and a survey of infectious diseases that emphasizes causative agent, symptoms, chemotherapy, and prevention. Exceptionally, students in the three-year or four-year program in Biology may take this course for Biology credit, but only if they have prior permission of the Department. (lec 3, lab 3) cr 6

ELECTIVES

To meet our program requirements, electives may be chosen from the following groups:

- Humanities: Canadian Studies, Classics, English, Film Studies, Folklore, Français, French, Greek, German, Italian, Latin, Linguistics, Music, Native Studies, Philosophy, Religious Studies, Russian, Spanish, Theatre Arts, Women's Studies.

- Social Sciences: Anthropology, Cooperative Studies, Gerontology, Economics, Geography, History, Law and Justice, Political Science, Psychology, Sociology.

- Sciences: Astronomy, Biology, Chemistry, Computer Science, Environmental Studies, Engineering, Geology, Mathematics, Physics.

- Professional Schools: Commerce, Education, Nursing, Physical Education, Social Work, Sports Administration, Translators.

PRIOR LEARNING ASSESSMENT POLICY

A goal of Laurentian University's School of Nursing, English Division is to facilitate access to BScN education and to promote a lifelong learning process. To this end, the School employs Prior Learning Assessment (PLA), an evaluative method for assessing a student's prior learning and ongoing professional development. The School invites students to participate in PLA at admission to the BScN program or prior to completing 15 credits. Prior learning is evaluated against established BScN course outcomes so that credit(s) can be awarded for equivalency. The percentage of credit granted toward the BScN degree is a function of the program applied to and the student's portfolio. In accordance with university policy, a student must complete a minimum of 30 credits in order to obtain a degree from Laurentian.

The PLA process necessitates the student to prepare and submit a portfolio. A portfolio is a comprehensive dossier encompassing a student's achievements, reflections, and critical thinking in view of previously acquired knowledge and skills. It can also include challenge exams, courses taken, work experience, volunteer work, and other life experiences. The School of Nursing has specific guidelines for the portfolio content.

Appendix K Con't

CREDIT BY CHALLENGE

Challenge in a given course is an opportunity for the registered nurse to demonstrate the ability to meet the objectives without actually taking the course. Credit in the course is earned by successful challenge. If the challenge is unsuccessful, the student must register for the course.

ADVANCED STANDING FOR REGISTERED NURSES

Students who have completed approved Health Assessment courses in their diploma program within the last five years and who have attained a minimum G.P.A. of 2.5 on these courses will be given advanced standing in NURS 2286 – Nursing Health Assessment.

Students who have successfully completed the Introduction to Nursing Management: Distance Education program sponsored by CAN/CHA or McMaster University will be given advanced standing in NURS 4025. Only students who have completed this course in 1982 or thereafter are eligible.

Students who have successfully completed the OHA Applied Management Skill Development – Series 1 and 2 can be considered for eligibility to challenge NURS 4025 after completion of the pre-requisite courses.

CAN Certification – 3 credits will be granted for a current CAN Certificate.

TIME LIMIT

Students must complete the nursing courses in eight calendar years from the beginning of the first nursing course at Laurentian University.

VITA AUCTORIS

Lorraine Carter was born in North Bay, ON. She completed an Honours BA and MA in English language and literature through the University of Western Ontario in 1979 and 1980 respectively. In 1981, Lorraine completed her BEd at the University of Toronto with specializations in English and music.

From 1982 to 1988, Lorraine taught at Marymount College in Sudbury, ON, teaching intermediate and senior English. In 1988, Lorraine became a faculty member in Laurentian University's Department of English where she continues to teach on a sessional basis. Lorraine has also worked in Laurentian University's Centre for Continuing Education as an instructional designer and project manager. While her work in continuing education has involved working with faculty on projects from all disciplines, she has particular expertise in online education for nurses. Presently, Lorraine is the Education Manager, Educational Events and Academic Partnerships for the Ontario Telemedicine Network (OTN).