The Evolution of Critical Thinking

by

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Research project submitted in partial fulfillment of the requirements for the degree of

Master of Nursing

WASHINGTON STATE UNIVERSITY

Intercollegiate College of Nursing

December 2004
December 2004

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ACKNOWLEDGEMENT

I wish to acknowledge the generous support and assistance given to me by my research committee. I would also like to acknowledge the support and direction that I received from Joan Caley and Lyzz Caley during the editing process of the research paper. I would like to acknowledge Dr. Becky Boehne for all her encouraging words and support in the reading of the research paper.

To my parents Don and Joyce Alberts, they have modeled their lives in service to community. To my father who has supported me by providing me with supportive and comforting words, and who also financially helped me with my schooling. To my mother, I want to acknowledge my mother for her encouragement and support during my educational experience.
The Evolution of Critical Thinking

Abstract

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Critical thinking has changed from when the concept was first described in the seventh century. Philosophers and educators have sought to define and improve the concept many times. There exists a plethora of definitions for critical thinking which makes assessing student skill difficult. Nursing has discipline-specific concerns related to these definitions in part because college accreditation standards require evidence of critical thinking. Sound critical thinking establishes the foundation for clinical judgment. Many colleges are in the process of transforming delivery towards online education. Since critical thinking refers to outcome in many nursing schools, discourse on methods by which to assess critical thinking especially in online learners is relevant. As online nursing courses evolve the need to design courses that facilitate critical thinking transcends to ensure that professional and institutional product and process outcomes are met.

Key Words: Critical Thinking

Nursing

Online Education

Clinical Judgment
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ACKNOWLEDGEMENTS</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>4</td>
</tr>
<tr>
<td><strong>CHAPTER</strong></td>
<td></td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>7</td>
</tr>
<tr>
<td>2. HISTORY OF CRITICAL THINKING</td>
<td>7</td>
</tr>
<tr>
<td>3. HISTORY OF CLINICAL JUDGMENT</td>
<td>10</td>
</tr>
<tr>
<td>4. HISTORY OF ONLINE EDUCATION</td>
<td>11</td>
</tr>
<tr>
<td>5. DEFINITIONS OF CRITICAL THINKING</td>
<td>11</td>
</tr>
<tr>
<td>6. NURSING DEFINITIONS</td>
<td>13</td>
</tr>
<tr>
<td>7. DEFINITIONS OF CLINICAL JUDGMENT</td>
<td>16</td>
</tr>
<tr>
<td>8. CHALLENGES IN TEACHING CRITICAL THINKING AND CLINICAL JUDGMENT</td>
<td>18</td>
</tr>
<tr>
<td>9. ONLINE EDUCATION</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Online Education Definition</td>
</tr>
<tr>
<td></td>
<td>Strategies to Promote Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>Framework for Assessing Online Outcomes in Nursing</td>
</tr>
<tr>
<td></td>
<td>Online Issues</td>
</tr>
<tr>
<td>10. IMPLICATIONS FOR NURSE EDUCATORS</td>
<td>24</td>
</tr>
<tr>
<td>11. CONCLUSION</td>
<td>32</td>
</tr>
<tr>
<td>12. REFERENCES</td>
<td>33</td>
</tr>
</tbody>
</table>
Dedication

This non-thesis is dedicated to my mother and father who provided

both emotional and financial support
INTRODUCTION

The Evolution of Critical Thinking

As higher education embraces virtual or distance learning, educators must determine and reinvent methods to evaluate critical thinking outcomes (Ryan, Carlton, & Ali, 1999). This is problematic as nurse educators currently struggle to define the critical thinking concept in order to meet professional standards and to produce skilled graduates. Education delivery through the World Wide Web (WWW) changes communication of critical thinking and thus teaching strategies. Nursing can not afford the luxury of simply maintaining status quo in education with the traditional classroom setting (Cuellar, 2002). Nursing educators want to improve critical thinking in both the traditional and virtual classrooms. With the new technology of online education, nurse educators must understand how critical thinking develops when using the WWW virtual classroom.

Understanding the similarities and differences between the evaluation of critical thinking in traditional and distance modalities may help nurse educators facilitate critical thinking during online discussion. The purpose of this paper is to describe the stumbling growth of critical thinking concepts into one of nursing most important skill. Educators want to teach and evaluate the skill in distance education. Approaches for nurse educators teaching the concept online are also discussed.

The History of Critical Thinking

Educators understood that people needed to think in order to solve problems even before Socrates. In those days, education consisted of a mentor and a pupil. Few people learned from the few available books. During the 1600's a philosopher named John Locke revolutionized education by identifying the theoretical foundation of critical thinking.
Locke (1952), a philosopher, laid out the theoretical foundation for critical thinking in his discussion of basic human rights and the responsibilities of government. In his essay Concerning Human Understanding, he argued that the government should submit to the reasoned criticism of thoughtful citizens. Locke’s essay articulated how reflection, intuition, reason, and sensation produce critical thinking. He thought ideas came from sensation or reflections. According to Locke (1952), intuition and reasoning are considered complex ideas. Educators began teaching that reasoning was a step by step process to be understood in the same way a malfunctioning clock could be taken apart and reassembled with fixed parts. Students were encouraged to make thinking rational rather than spiritual; to wrestle with concepts rather than to accept circumstances as ordered. The ideas of thinking continued to expand while educators faced larger groups of people from classroom with new technologies such as textbooks and blackboards.

In the 20th century, critical thinking emerged more explicitly. Sumner (1906) published a study of the foundations of sociology and anthropology. He supported the need for critical thinking in education in his work of Folkways (Sumner, 1906). He wrote that criticism is the examination and test of propositions of any kind that are offered for acceptance, to determine whether they correspond to reality or not.

Like Sumner (1906) Dewey addressed the concept of critical thinking in education. Dewey discussed reflection in 1910 as an aspect of reflective thinking. His work provided a sense of the pragmatic basis of human thought, especially its grounding in actual human purposes, goals, and objectives (Dewey, 1926). Both Sumner and Dewey’s work developed the concept of critical thinking in the United States and provided a basis for it both in education and practice. The current shift in education is toward online education.
The latest technology to shape critical thinking is telecommunications. The WWW forces people to communicate differently for example; telecommunications permits classes to reach larger numbers of people but also allows for a teacher student mentoring like in the days of Socrates. The main method of transmitting thoughts is through writing permitting collaborative reflection rather than passive acceptance of expertise. Mass communications morph education by permitting larger groups of people to access increasing amounts of information. Educators struggle to understand changes and their meaning. Online asynchronous communication is accomplished through writing. Critical thinking is developed through reflection and now includes collaboration.

Little thought was given to critical thinking in nursing until the 1950’s, when nursing education moved from the hospital setting to college settings. It was not until the late 1980’s, when critical thinking became a standard outcome of college education (National League of Nursing, 1989). Since then, critical thinking has become an important part of nursing curriculum. The National League for Nursing (NLN) criteria for Baccalaureate and Higher Degree Programs Accreditation affirm that critical thinking is an essential component and outcome of baccalaureate education for professional nursing practice (NLN, 2002).

In the most recent accreditation guidelines of the NLN for Baccalaureate and higher degree programs mandate schools develop a plan for systematic evaluation of critical thinking as a required outcome (Bell et al., 2002). National League for Nursing Accrediting Commission 2002 mandates that graduates of nursing programs must demonstrate critical thinking, reflection, and problem solving skills (Staib, 2003). Nursing online educators must also fulfill the requirement of being able to demonstrate that online students are able to critical think.
Nurse educators focus on critical thinking because it is needed for the skilled judgment in delivering care to clients. Nursing practice requires a high level of critical thinking ability in order for appropriate decision making to occur. Critical thinking is essential to improve practice judgment and it contributes to personal and professional development through the abstraction of principles from specific contexts and applying them across a range of situations (Daroszewski, Kinser, & Lloyd, 2004). As a nurse becomes more knowledgeable and experienced, her/his thought process becomes more automatic and action replaces conscious thought. This is when the nurse progresses from novice to expert. Education for nurses provides opportunities to build critical thinking skills that contribute to clinical judgment.

History of Clinical Judgment

The concept of clinical judgment was first identified by Benner (1984). In *From Novice to Expert*, Benner (1984) used the Dreyfus model of skill acquisition to describe and interpret clinical judgment in nursing practice and education. The Dreyfus model is developmental; based on situational performance and experiential learning. In Benner’s (1984) explanation of Dreyfus’ model, recognition of clinical situations moves from abstract textbook accounts of general features to an experienced-based response of the situation. Grasp of the situation, with its possibilities and constraints, enables the competent nurse to move from rule-governed thinking to an intuitive grasp of the situation. The intuitive grasp is based on experience. A sense of salience develops over time so that some things stand out as more plausible and appropriate than others (Benner, 1984). By understanding clinical judgment and critical thinking the nursing educator can more readily incorporate these concepts in nursing into online education courses.
History of Online Education

Distance education began over the radio in the 1920's (Khan, 1997). By the late 1990's the Internet changed the face of education. Asynchronous computer based instruction reached a larger audience and offered different learning methodologies. Sixty percent of higher education institutions offering distance education courses used this technology, compared to 22 percent in 1995. There were more than 1.3 million enrollments in college level distance education courses during 1997-1998 (National Center for Education Statistics, 2002).

This trend is true in nursing courses, especially with the use of web-based courseware such as Blackboard (Billings, 2000). Blackboard software packages define education as an approach to teaching and learning that utilizes Internet technologies to communicate and collaborate in educational context (Khan, 1997). Teaching online courses is still in its infancy, especially in many nursing programs (Billings, 2000). Teaching involves web-based courses that entail a dynamic interaction among the technology, teaching, and learning practices (Billings, 2000; Ryan, Carlton, & Ali, 1999). This dynamic interaction of technology, teaching and learning practice helps further critical thinking. As nursing educators understand online education and the importance of communication during online education will help promote critical thinking.

Definitions of Critical Thinking

Critical thinking is that method of thinking about any subject, content or problem in which the thinker improves the quality of his or her thinking. Critical thinking is developed by skillfully taking charge of the building fundamental thinking and imposing intellectual standards upon students (Miller & Babcock, 1996). Critical thinking is used at every educational level and in every academic discipline to facilitate purposeful thinking in students.
Critical thinking has been defined by many educators and philosophers. Some definitions of critical thinking are long and repetitive, others short and concise; some emphasize skills, others dispositions, some emphasize context, others focus on evidence and argument. Some authors have defined critical thinking with other disciplines to provide broader process and focus. Some authors define critical thinking according to their discipline, focus, and need.

Ennis' (1989) work brings critical thinking closer to the present. Ennis, who is grounded in the discipline of education, defined critical thinking as a process involving reasonable and reflective thinking focused upon deciding what to believe or what to do (Ennis, 1989). This has important relevance not only in the discipline of education but also could be used in other practice disciplines.

Nurse authors more recently partnered with other disciplines to describe critical thinking and how it applies to all professions. Some authors have described critical thinking as a process, which may be described as either simple or complex. Fisher and Scriven (1997) defined critical thinking as skilled and active interpretation, evaluation of observations, as well as communications information and argumentation. Brookfield, (1995) who is grounded in education suggested that the terms critical analysis, critical awareness, critical consciousness, and critical reflection are often used synonymously with critical thinking. Elder and Paul, who have a similar background in education defined critical thinking as the ability of thinkers to take charge of their own thinking (Elder & Paul, 1994). This requires that they develop sound criteria and standards for analyzing and assessing their own thinking and routinely use those criteria and standards to improve its quality.

Paul then goes further to identify the elements of reasoning for critical thinking. He (Paul, 1992) conceptualized critical thinking as a process that consisted of eight elements of reasoning.
The elements are: (a) Purpose, goal, or end in view; (b) question at issue or problem to be solved; (c) point of view or frame of reference; (d) empirical dimensions of reasoning; (e) conceptual dimensions; (f) assumptions; (g) implications and consequences; (h) inferences and conclusion. Paul’s (1992) components of critical thinking and his definition are similar but not exactly the same. They have commonalities such as a focus on reflection. However, the definition provides an overview of what critical thinking is while the elements present more detail and process direction. Some definitions are more specifically designed for nursing and are more of a process in developing critical thinking.

Nursing Definitions

Nursing was slow to adopt a standardized definition of critical thinking. In the late 1980’s, the National League for Nursing (NLN) developed an early first definition of the concept (NLN, 1989). Later, in 2002, in order to provide a standard definition of critical thinking for the nursing profession, the NLN defines critical thinking as a discipline specific, reflective reasoning process that guides a nurse in generating, implementing, and evaluating approaches for dealing with client care and professional concerns. Yet not all subdisciplines of nursing find the NLN definition useful. This problem is complicated by the inability to evaluate student skill levels. For instance, the NLN discusses critical thinking as a process, yet educators tend to evaluate products like research papers, tests, and care plans as evidence of ability.

Critical thinking includes evidential, conceptual, methodological, and contextual considerations upon which judgment is based (Billings & Halstead, 2004). Yet nursing literature reveals that critical thinking is related to and equated with reflective judgment, intelligence, logical thinking, problem solving, nursing process, and the decision-making process (Billings, 2000). Clearly, the NLN’s definition of critical thinking did not stop the discussion. Some nurse
authors discuss critical thinking in such a way that it could be used by other disciplines.

Molinari, Abegglen, and Mills (Molinari & Dupler, 2004) developed a theory which defines critical thinking as a dynamic blending of perceptive, affective and cognitive processes for reflective decision making. The theory emphasized two processes: information gathering and processing. This theory also suggests that emotional factors are as important as cognitive information, and that nurses need to identify internal as well as external information sources when processing decisions.

Reflecting on information is a common element of critical thinking. In relation to critical thinking, partnerships between disciplines continue to value reflection as an important element of critical thinking. Paul and Heaslip (1995), a registered nurse, revised the elements of reasoning for critical thinking to be more specific to nursing which also includes reflection in the process: (a) Purpose, goal, or end in view in nursing; (b) question of a nursing issue or problem to be solved; (c) nursing point of view or frame of reference; (d) empirical dimensions of nursing reasoning; (e) conceptual dimensions; (f) nursing assumptions; (g) nursing inference; (h) nursing implications and consequences; (i) implicit and explicit reason in nursing. For each element of reasoning stated above nurses can be asked to justify their reasons. Each step in the nursing process can be investigated for its justification. These elements of reasoning offer a comprehensive and cohesive framework for helping students reason through complex issues based on the natural language (Paul & Heaslip, 1995). Clearly, these elements are similar to the earlier ones described by Paul (1992) but have been adapted to fit more with nursing language. Paul and Heaslip (1995) focused on critical thinking rather than on clinical judgment. By eliminating the clinical judgment, critical thinking can be equated to the work done in other disciplines.
Other nurse theorists partnered with different disciplines than their own are example, N. Facione, and P. Facione, (1996). They defined critical thinking as being purposeful, self-regulatory judgment which results in the interpretation analysis, evaluation, inference, as well as the explanation of evidential, conceptual, methodological, criteriological, or contextual consideration upon which the decision is based. Facione’s (1998) work focuses on the core skills and disposition of a person using critical thinking. A skilled thinker uses analysis, interpretation, inference, self-regulation, explanation and evaluation.

Some of the concepts mentioned previously are used in the “nursing process”. The nursing process is a standard method of making patient care decisions, which includes analysis, interpretation, implementation and evaluation, there is more to the nursing process than just those skills (Potter & Perry, 2001). However, reflective thinking is required to arrive at a sound clinical judgment. In nursing, the skill of clinical judgment depends on sound critical thinking.

Nurse authors frequently identify clinical judgment and critical thinking as important components in nursing. Kataoka-Yahiro and Saylor (1994) describe “Critical Thinking Model of Nursing Judgment” as critical thinking process as reflective and reasonable thinking about nursing problems without a single solution that pays attention to deciding what to believe and do. Their work echoes Ennis’ definition. The model defines the outcomes of critical thinking as nursing judgment. Five components of critical thinking for nursing judgment are specific knowledge, experience, competencies, attitudes, and standards in nursing. Knowledge based on courses in the sciences and humanities, and nursing is necessary to think about nursing problems. Experience refers to practical knowledge in an applied discipline that is only developed through clinical experience. Competencies are cognitive processes that focus on general critical thinking, specific critical thinking in clinical settings, and specific critical thinking in nursing. Attitudes
include confidence, independence, fairness, responsibility, risk taking, discipline, perseverance, creativity, curiosity, integrity, and humility. Standards include two parts, intellectual standards, and professional standards. Intellectual standards include clarity, precision, specificity, accuracy, relevancy, consistency, logicality, depth, broadness, completeness, adequacy, significance, and fairness. Professional standards include ethical criteria for nursing judgment and criteria for evaluation. This model relies on both explication of critical thinking and clinical judgment.

The critical thinking embedded in student’s clinical judgment occurs when students identify the problem, select appropriate scripts, and infer the need for creative interventions or anew script (Facione, 1995). For nurses, critical thinking occurs most effectively when novel or new problems are analyzed, then research hypotheses are then evaluated (Facione, 1995).

Definition of Clinical Judgment

Clinical judgment expands from critical thinking taking nursing to another level of thinking and experience. Benner (1984) describes how clinical judgment develops from experience and practice, having known from past experience what to expect and to act instinctively without thinking but by intuition. Critical thinking and clinical judgment develops over time and experience. Clinical judgment is used when working with clients. Critical thinking is used in any situation that requires view or opinion.

One difference between critical thinking and clinical judgment in nursing has to do with the level of engagement of the practitioner and the notion that clinical judgment takes place in an engaged practice context, whereas critical thinking may be thought of as more abstract. Yet, an important similarity between critical thinking and clinical judgment in nursing has to do with the importance of reflection. In order for the nurse to truly become an expert, she or he must engage fully in reflecting upon his or her practice.
Expertise evolves over time. Expertise in nursing has been addressed by Benner (1984). Benner and others described the concept of clinical judgment and how it develops. Benner, Hooper-Kyriakidis and Stannard (1999) identified six aspects of clinical judgment and skillful comportment that can be viewed as interpretive aspects of critical thinking: (a) Reasoning in transition involves the thinking-in-action demanded as ongoing situations evolve over time; (b) skilled know-how refers to embodied intelligent execution which involves knowing what to do, when to do it and how to do it; (c) response-based practice involves the ability to read a situation and respond flexibly and proactively to changing needs and demands; (d) agency refers to the nurse’s ability to function within a given situation; (e) perceptual acuity and involvement refers to acquiring a good grasp of the situation through emotional engagement with the problem and interpersonal involvement with patients and families; (f) linking clinical and ethical reasoning-notions that guide the actions of nurses and help them notice clinical and ethical threats to patients’ well being. Benner has worked with others on clinical judgment.

According to Benner and Tanner (1987) intuition is an essential element of clinical judgment. Intuitive judgment has six key aspects: (a) pattern recognition, (b) similarity recognition, (c) commonsense understanding, (d) skilled know-how, (e) sense of salience, and (f) deliberative rationale. Intuitive judgment is what distinguishes expert judgment from the decision or computation that might be made by the novice (Benner & Tanner, 1987).

Clinical judgment draws from the amount of experience the nurse has and the familiarity with a situation. The response to the situation varies with amount of experience and recognition of the experience the nurse has. The amount of experience determines the ability to act instinctively.
One critical thinking author that addresses clinical judgment is Facione. Facione (1995) wrote about clinical judgment suggesting behavioral responses to clinical problems are: automatic, scripted, or reflective. Automatic responses are those responses that occur without conscious thought. The expert nurse performs many familiar tasks while providing care automatically. Scripted problem-solving behavior occurs when one identifies a problem that can be solved by a previously defined solution path. Reflective judgment continues to be involved when identifying the appropriateness of a script, or when problems less defined or present new circumstances. Learning scripts for well defined clinical problem and when they can be appropriately used becomes an important task of the nursing student. Both automatic and scripted behaviors are believed to be a product of prior reflective thinking which now has become automatic or scripted for problem situations (Facione, 1995). Facione (1995), Benner and Tanner’s (1987) frameworks are similar to each other in that they both state expert nurses may react automatically in situations. There are challenges in teaching these concepts during online education courses.

Challenges in Teaching Critical Thinking and Clinical Judgment

Nursing programs need to teach critical thinking during online courses. One of the challenges educators face is the plethora of definitions of critical thinking which creates problems for educators trying to evaluate and plan how to teach the concept. Educators struggle to choose an appropriate definition of critical thinking and process. Having so many definitions of critical thinking creates challenge for both the educator and the student. Nursing programs attempt to demonstrate their students’ development of critical thinking skills during the education process. Without a clear definition of critical thinking, curricular evaluation is impossible to achieve. Unless some agreement among educators exists what constitutes critical thinking,
critical thinking courses, and methods of teaching the concept can be expected to be as varied as the definitions.

Having so many definitions of critical thinking makes it difficult to determine if the outcomes are truly met. This in turn may lead to confusion about which definition is right for the course being taught and which one best the needs of the institution. Having so many definitions causes difficulty in assessing and evaluating outcomes of the course and the curriculum. Assessment and evaluation must occur to determine if the objectives, goals and outcomes are met. If one educator believes that critical thinking is an outcome and another educator believes it is a process, program planning, concept teaching and course evaluation becomes very difficult.

Educators first must define critical thinking and then assess it during the course. The second challenge of critical thinking has to do with assessment. Without a standard definition of critical thinking assessing the course is difficult to evaluate. Not being able to assess the outcome could impact not only the course but the institution as well. Accrediting agencies require schools that claim to teach something to have assessment programs in place to demonstrate whether or not students have achieved the stated outcome. If colleges assert critical thinking as one of their intellectual goals, an agreement on the concept of critical thinking must be made. Without this consensus, it becomes very difficult to design standardized tests, and it remains very difficult for instructors with different approaches to compare pedagogies and outcomes.

Another major challenge has to do with creating assignments and online discussion that fosters critical thinking skills. Educators are challenged to carefully design instructional activities that guide students into on-line learning situations that promote personal acquisition of knowledge of the content. The context of learning critical thinking skills are interactivity and built upon taking individual responsibility for academic achievement. Interactivity is a vital issue
for educators to create assignments that promotes academic dialogue and cultivates critical thinking skills. Critical thinking includes reflective thinking. Reflective thinking requires being dedicated to improve individual academic performance by continuously enhancing cognitive skills.

Nursing research literature reports a lack of definition consensus and the inability to measure the concept. For instance, Videbeck’s (1997) study that found 55 nursing programs using ten different definitions of critical thinking. Videbeck’s study was conducted using a variety of measurement tools to assess critical thinking (Videbeck, 1997; Gordon, 2000). Without of a clear conception of critical thinking it is difficult to convince skeptical faculty and community members that enhancing student critical thinking abilities are being met by the college of nursing. The inability to define and measure the concept of critical thinking in face to face environment complicates the nursing education’s migration to the WWW. Educators need to know what definition and strategies could also be used to develop critical thinking for online education courses.

Online Education

Many colleges are shifting towards using distance education paradigms in order to reach more students. Online education can be face-to-face or asynchronous, which is the process of communicating through the WWW. As online education continues to expand; more educators need to learn how to teach in distance education courses.

*Online Education Definition*

Distance education is the process whereby the learning of a student occurs when the instructor and the student are geographically separated across this distance is accomplished by one or more forms of technology like audio, video, data and print, often combination with face to
face is used to bridge instructional gap (Kahn, 1997). Educators should know that there are strategies used to promote critical thinking during online discussion.

*Strategies to Promote Critical Thinking Online*

Advancing critical thinking skills is of great concern to nurse educators and health care employers. Nurse educators must demonstrate that student nurses can think, even within the rapidly changing environment of online nursing courses. In addition, the recent focus on proving educational outcomes forces faculty to examine the assessment of critical thinking (Magnussen, Ishida, & Itano, 2000). Billings and Halstead (2004) encourage educators to understand how to best facilitate critical thinking in online nursing courses. Strategies used by Billings and Halstead (2004) to promote critical thinking included: (a) Collaborative learning, which promotes active and reflective learning, provides the opportunity for students to become accountable for their own work as well as the work of others in their group; (b) Dialogue helps promote critical thinking for online courses, for it provides a point of reference from which to explore concepts from multiple points of view, promotes reflection and critical analysis and increases contextual learning; (c) Reflective questioning promotes active thinking, increases interaction between students and faculty, and promotes higher level of problem-solving skills (Billings & Halstead, 2004). Faculties strive to encourage positive learning habits that foster both self-directed learning styles and collaboration with other students. Strategies are used to promote critical thinking includes the previous ones mentioned, there are also other strategies that can be used.

Additional strategies to promote critical thinking in distance education courses include, Chickering and Gamson’s (1987) seven principles of good practice that enhance effectiveness of online learning promotes critical thinking by: (a) student/faculty contact, (b) reciprocity and
cooperation among students, (c) active learning techniques, (d) prompt feedback, (e) communication of high expectations, (f) time on task, and (g) diverse talents and ways of learning (Harden, 2003; Sternberger, 2002). Incorporating these strategies will help facilitate critical thinking in nursing students and having a framework that supports these strategies will promote the outcome. The outcome then can be assessed in web-based courses.

*Framework for Assessing Online Outcomes in Nursing*

One example of web-based outcomes assessment is Billings’ (2000) *Framework for Assessing Outcomes and Practices in Web-based Courses in Nursing*. Billings’ work is the only nursing framework found that describes distance learning in nursing. As with other forms of distance education, teaching and learning involves a dynamic interaction of the technology, teaching-learning practices, faculty and student development, and outcomes.

Outcomes are influenced by educational practices. To promote critical thinking, access, convenience, professional practice socialization is part of the outcome in distance education. To help faculty promote critical thinking in distance education the following need to be included in the online education progress: faculty development, ongoing technical support, and workload recognition. Faculty need to provide students with information, learning resources, ongoing technical support and orientation to technology in order for the students to reach the outcome of critical thinking. Faculty can provide educational practices that include active learning, time on task feedback, student-faculty interaction, respect for diversity and interaction and collaboration with peers to promote critical thinking (Billings, 2000). The five concepts of Billing’s framework facilitate teaching and assessment of the WWW. Billings’ work is meant to support online educators and improve the work in teaching and assessing critical thinking during online education courses.
Online Issues

When education moved to the online environment, the lack of a standard definition of critical thinking complicated instructor's lack of knowledge of how to promote critical thinking. The move from the traditional classroom to the virtual classroom becomes complicated by having to design the curriculum that promotes critical thinking during online asynchronous discussion. Educators need to seek knowledge of how to teach and promote critical thinking during online discussion.

To effectively teach critical thinking, nursing online educators must be able to define critical thinking. Faculty working in the traditional classroom struggle to teach critical thinking because of the many definitions of critical thinking from which they have to choose. Nursing educators teaching online face an additional layer of complexity because of asynchronous communication.

During asynchronous online courses all communication occurs through only writing, which may cause critical thinking, may develop differently (Khan, 1997). More research is needed to determine if critical thinking develops differently during online education courses compared to the traditional classroom setting. There is no face to face communication in asynchronous online learning (Palloff & Pratt, 2001). Although previous educators of critical thinking pedagogies have concentrated mostly on either writing or in-class discussion, in the online asynchronous milieu electronic discussion must meet the task through writing. Another challenge is the time it takes to exchange messages, asking for clarity, and feedback then that is complicated by time consumption waiting for asynchronous collaboration by the other students. Emotions are felt more strongly due to the reflection time involved in writing. Diversity issues impact how information is received and processed by students.
Online students depend upon entirely writing skills to develop their thinking. Orienting to the problem, brainstorming, alternatives, seeking, resources, analyzing components, relationship building and maintenance, developing arguments, evaluating results all take place through keyboarding. Students must shift from employing strong verbal strategies and skills to the weaker written ones. Written dialogue is conducted differently (Molinari & Dupler, 2002). Writing is essential for critical thinking because the student learns how to develop arguments supported by logic and evidence. There are strategies that are used to help promote critical thinking in students, for example dialogue with peers. Dialogue allows for discussion between students aimed at producing innovative answers and interpretations and understanding and evaluating the interpretations and opinions of their colleagues, this promotes collaborative learning. When used effectively, electronic discussion can provide a natural support for teaching critical thinking to the group of students by capturing the features of the traditional writing assignments and in-class discussion. Dialogue with the nursing educator guides the student to finding resources, answering questions and providing feedback. The asynchronous nature of electronic discussion allows the student time to reflect on what others have said and how the student wishes to respond. In the move from the traditional classroom to virtual classroom course content needs to be designed to promote the asynchronous discussion.

Implications for Nurse Educators

For critical thinking to occur during the web-based distance educational course several factors have to be in place which includes interactivity, dialogue and language. Interactivity includes communication, participation, and feedback or interaction among students and between students and their instructors (Muirhead, 2001). Dialogue is a key element in interaction. Clarity and precision in words result in clear and precise thinking. The effective of the words or
language depends on the skill of the writer. Recognizing emotive language is another important aspect of language usage in critical thinking (Daroszewski, et al., 2004).

These implications call for creativity in course development, course design and orientation, active communication with students, support for technical problems and faculty development (Billings, Connors, & Skiba, 2001). When changing from conventional to virtual classrooms several issues arise: (a) dealing with the plethora of critical thinking definitions, (b) how to assess critical thinking during online discussion, (c) the need for standards to ensure the highest level of quality is promoted, d) redesign of course content. The focus is on critical thinking and how to promote it during online education.

Nurse educators can choose from an excess of critical thinking definitions, but finding one that meets the needs of the distance online education students is more challenging. Although a standardized definition for online education courses that is similar to other nursing courses would benefit assessment and comparison, academic freedom issues and the plethora of current definitions make this unlikely unless the educator is teaching in both the traditional and virtual classroom. A standardized definition however, could allow for nursing courses to be evaluated to see if critical thinking was met as an outcome. Yet, most authors of critical thinking define the concept as a process and not an outcome.

The lack of a standardized definition of critical thinking means that the topic cannot be discussed by faculty of other online distance education courses. The lack of understanding of critical thinking creates teaching and learning problems. There are so many different definitions of critical thinking used by schools of nursing it is difficult to compare outcomes of online nursing courses.
The lack of a standardized definition means the outcomes are difficult to measure against other online courses and other students. Lack of standardized definitions makes it difficult to determine if the goals and outcomes of the course were met, then determine if the outcomes of the curriculum and college were met. Without a standardized definition of critical thinking, nursing research for validity and reliability would be hard to evaluate. There is a need for more research in online education but without a standardized definition will be difficult to evaluate the outcomes to see if online education does promote critical thinking.

When varying definitions are used, there is a lack of consensus which prevents dialogue. Developing an online curriculum becomes difficult because of the lack of standardized definition. With one standardized definition then online education could compare and evaluate critical thinking during online asynchronous courses. Nursing educators and theorist need to develop a standard definition of critical thinking that can be accepted by the NLN for online education courses, for critical thinking may develop differently than is the tradition classroom setting. Most nursing educators define critical thinking as a process.

The assessment of critical thinking as a product or a process is complex. Judging the quality of critical thinking as an outcome is the responsibility of the educator as the pedagogical and content expert. The outcomes provide evaluation criteria which can be assessed to determine if a specific goal was met. Individual student’s critical thinking is best judged through individual educational assignments rather than through group coursework. The most relevant evaluation of the process of critical thinking could be determined by an articulation of the understanding of the process, for example reflective journaling. Facilitating the process of higher-order learning online could be assisted through the use of tools to assess critical thinking and reflection. Course
design should include problem solving and critical thinking questions and assessment of the process as well as the product.

Online course design should include the goal of developing student critical thinking skills. The skill is developed through problem solving and critically thinking. Critical thinking is a requirement for colleges of nursing to become accredited. One way to assess advancement in critical thinking skills before and after educations would be to have students take a critical thinking exam at the beginning of their nursing program and take the same exam at the completion of their nursing program. By testing at the beginning and at the end nursing educators can see the progress of the critical thinking ability of each student. Nurse educators can assess the change in the critical thinking scores of each student and the college can evaluate each student to determine if each student gained critical thinking skills while at the college of nursing. The testing could be done online, and include online education courses.

Online courses require instructors to organize content, develop different learning activities, communicate with students and assess their progress differently from traditional nursing courses. In order to make the transition, novice online educators will need instruction in how to develop courses that promote critical thinking using the new media. Not only do instructors need to learn how to design courses, but they will need to know how to facilitate online groups so that students reach their optimal growth.

Students need feedback regarding how they are progressing in their courses and if they are meeting module and course outcomes. Effective communication is important in success in online teaching. Effective communication promotes collaboration, reflections and critical thinking in the responses from the students on the topic that is being discussed for that week. Educators need to provide the structure for the course materials and direct students toward course
outcomes. Collaboration by both the educators and the students promotes critical thinking and provides an opportunity to discover the resources that are available.

To assess critical thinking the educator should know the educational level and nursing background of the student to determine if the student met the objective of the course and progressed in their critical thinking skills. For online success there needs to be dialogue to advance critical thinking in online courses and collaborative learning promotes active and reflective learning. Reflective questioning promotes active thinking, increases interaction between students and faculty, and promotes higher level of problem-solving skills. Prompt feedback and high expectations in communication will promote critical thinking in online students.

Course content must be reconceptualized to present information and theory application as well as provide electronic resources to ensure that the students are getting the information to promote critical thinking. Adequate orientation is imperative to create a sense of security with content, process and technical application. Interactive communication improves the process (Jairath and Stair, 2004). Faculty need to be creative in developing an environment for participation interaction and socialization so that the students will collaborate and make critical thinking responses. Providing faculty sufficient time to design and maintain courses and adequate information technology support is important. Communication with students requires frequent responses from faculty.

The shift to online learning poses enormous challenges to educators and their institutions. The art of teaching online is relatively new, key areas to ensure active learning need to be implemented. Ensuring access to and familiarity with the technology that will be used; establishing guidelines, striving to achieve maximum participation, and buy-in from the students,
promoting collaborative learning and reflective learning, are elements that help promote critical thinking during the online course.

In order for students to develop their optimal critical thinking skills, their faculty should be proficient with the media used in the course. Faculty teaching web based courses must possess strategies and skills to communicate with their students electronically in the absence of visual and oral cues. As a result faculty teaching distance education should be prepared to spend a good deal of time preparing for distance courses than traditional classroom courses. For faculty it takes more time to communicate with students electronically. Asynchronous environment allows students the luxury of time for thought and reflection on material which enhances learning process. Online distance educators need to develop a sense of community in the group of students in order for learning process to be successful in collaborating with the other students to promote critical thinking by reflecting on what the others students have written in their responses. Faculty must keep up with the odd hours many distance education students have to devote to their course work and the more tenuous connection many of them have to the institution. To reduce potential attrition, faculty must answer questions in a timely manner, grade papers quickly, and follow up with students within a week or two if they are not participating in class for the student to know if they are meeting the objective and goals of the course, goals also include the process of critical thinking.

One crucial challenge in developing critical thinking in distance education is the need to develop a rich level of personal interaction between the nursing educator and student and among students themselves. The educator needs to develop a sense of community in the group students in order for learning process to be effective. Another important consideration is the educator’s willingness to give up some control of teaching and learning process in order to empower the
students and build a learning community. As the educator, being a good role model is
demonstrated through high quality participation by logging on frequently and contributing to the
discussion.

If critical thinking is to occur students must be engaged by assignments. In order for
engagement to occur several things need to happen. Discussions need to be seen as an integral
part of the course. And discussion should be clearly connected to the material being covered.
Motivation is important to engage the student into learning, making the topic interesting and
empowering will help motivate students to learn and think. Empowering the students will
motivate them to seek more information and gain knowledge of the topic of interest.

It is important that the educator be a moderator of the discussion to help the student stay
focused and keep students on task, these actions will help promote critical thinking by the
students. To promote critical thinking, the instructor should guide students to discover insights,
rather than provide insight for them. The role of the instructor should be to maintain focus,
moving the discussion along, giving prompt feedback and periodically prompting students to
reflect (Koeckeritz, Malkiewicz, & Henderson, 2002).

Nursing educators need to understand the online technology, and be willing to do the
research needed to develop skills in teaching distance education. To teach effectively on web­
based courses entail self-motivation interaction among technology, teaching, and learning
practices. Strategies can be used in web-based courses to promote critical thinking. The
strategies known to be used in web-based courses include collaborative learning, dialogue,
reflective questioning, student/faculty contact, active learning techniques, prompt feedback,
communication, time on task, and diverse ways of learning. Distance education calls for a
specialized set of skills, teaching distance education courses should be a matter of faculty choice.
Challenges can overwhelm the educator, but by knowing what to do and how to solve the problem promotes learning and critical thinking of students. Nursing educators need to demonstrate effective writing skills. In developing online courses critical thinking strategies should be incorporated, these strategies include collaborative learning, dialogue, reflective questioning, case studies, online quizzes, and computer assisted instruction for undergraduate students.

Case studies are designed to promote dialogue among students by offering opportunities to discuss real-life issues and nursing challenges in a safe environment. Case studies stimulate students’ critical thinking, provide models of how to think professionally, and force students to use theoretical concepts to elucidate a practical problem. Students can work through case studies individually or in groups. Whichever way, feedback is important. The educator can emphasize important points or guide them in the right direction by posting hints or comments on the discussion board for all to see and consider.

Reflective questions and collaborative learning can engage students. Critical thinking test items must be written at the application or higher cognitive level. Students must be able to apply concepts taught in the virtual classroom to clinical situations. The information can be done through dialogue or reflection. A clear definition of critical thinking is important to be able to assessment and evaluate the ability of the student to determine if course outcome are met.

Measuring participation by the student can also be challenging, for the instructor has no way of know who is actually doing the work and corresponding in the discussion. Another challenge is comparing critical thinking between students not knowing their experience and background. Collaborative learning provides the opportunity for students to become accountable for their own work and as well as the work of others in their group. Dialogue provides a point of
reference from which to explore concepts from multiple points of views, promotes reflection, critical analysis, and increases contextual learning. Reflective questioning promotes active thinking and increases interaction between students which results in higher-level of problem solving skills. By being able to compare how the student has developed during the online discussion, will help determine if critical thinking has been accomplished.

Conclusion

Online teaching offers a new paradigm in higher education and has the potential to take the nursing profession into the next century. Online nurse educators must understand the differences between traditional and virtual classroom courses. Online courses need to be designed to meet the needs of students’ busy lives that is, geared towards asynchronous communication options. Yet, at the same time they need to be designed to promote online discussions that support and foster critical thinking. The online educator needs to understand the complexities of course design, including negotiating the software platform (like Blackboard), the technical support available, the best practices for online learning, the increased time commitment, and online methods for helping students to build a learning community in which they are safe to demonstrate critical thinking. By understanding these complexities, online nurse educators can effectively promote and assess critical thinking.
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