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Critical thinking as an outcome measure in baccalaureate schools of nursing

Sheila Lea Videbeck

Iowa State University

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Critical thinking as an outcome measure
in baccalaureate schools of nursing

by

Sheila Lea Videbeck

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1995
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GENERAL INTRODUCTION

Background

In recent years, the assessment of educational outcomes for all levels of education has received attention from a variety of constituencies. Nichols and Wolff (1990) state that "the higher education movement most likely to affect institutional research in the immediate future is the implementation of outcomes assessment across the country" (p. 81). This movement began in the 1980s with the publication of four reports that called for the improvement of undergraduate education and the assessment of student learning. These four studies were: To Strengthen Quality in Higher Education: Summary Recommendations of the National Commission on Higher Education Issues (1982); A Nation at Risk: The Imperative for Educational Reform (Bennett, 1983); To Reclaim a Legacy: A Report on the Humanities in Higher Education (Bennett, 1984); Involvement in Learning: Realizing the Potential of American Higher Education (National Institute of Higher Education, 1984) (Nichols & Wolff, 1990). Outcomes assessment rapidly became an issue in its own right, aided by Secretary of Education William Bennett, who stated in 1985 that colleges should measure their success against their stated goals, and make the results public, or outside interests would do it for them. In 1988, policies and criteria of the regional
accreditation associations for higher education were changed to reflect the emphasis on outcomes assessment by requiring all institutions to develop and implement educational outcomes assessment plans.

The categories of student outcomes are not discrete, but usually include cognitive skills (academic achievement, knowledge in major, subject matter competence), basic skills (intellectual growth, impact of college experiences, relating to external world), and value-added (attitudes, values, moral, personal, social, and cultural development) (Astin, 1991; Volkwein, 1990; Middaugh, 1990; Pascarella & Terenzini, 1991). Pascarella and Terenzini (1991) include critical thinking in the cognitive-psychosocial category, linking it with cognitive skills and intellectual growth. Astin (1991) states that one of the tasks of developing appropriate outcome measures is the operationalizing of the conceptual outcomes.

Need for the Study

The accreditation criteria of the regional accreditation associations for higher education apply to schools of nursing that are located in colleges and universities. In addition, baccalaureate nursing programs are accredited by the National League for Nursing (NLN). Nurse representatives of the Council for Baccalaureate and Higher Degree Nursing Programs
develop and approve accreditation criteria used to evaluate those nursing programs. In 1989, the NLN revised accreditation criteria to include outcome measures. One of these measures is "Required Outcome Criterion 1: Critical Thinking - This outcome reflects students' skills in reasoning, analysis, research, or decision making relevant to the discipline of nursing" (NLN, 1992, p. 26).

Nurse educators have identified a need to focus on critical thinking skills. Jones and Brown (1991) write that critical thinking has been adopted as a goal in current educational reform in virtually every academic setting, but has only recently been addressed in nursing education. They further state that critical thinking is not clearly understood nor systematically applied. Bowers and McCarthy (1993) note that analytic thinking skills are crucial for solving complex clinical problems. "Nurses need finely honed critical thinking skills in order to be safe, competent, and skillful practitioners of their profession" (Miller & Malcolm, 1990, p. 67). In contrast, Kintgen-Andrews (1991) noted that there is no evidence of a relationship between measures of critical thinking and clinical judgment in nursing.

There is not agreement on the issues of what constitutes critical thinking and whether or not programs of nursing education further the development of critical thinking. Miller and Malcolm (1990) cite numerous definitions of
critical thinking that have been used in previous studies noting "there is considerable discussion and little agreement on the meaning of critical thinking (p. 67). They write that studies attempting to measure the impact of a nursing curriculum on the critical thinking skills of students report both significant improvements in critical thinking skills (Frederickson, 1979; Berger, 1984; Miller & Malcolm, 1990) as well as no significant improvements (Sullivan, 1987). Kintgen-Andrews (1991) reviewed literature reporting studies on nursing education's impact on students' critical thinking. She found no significant improvement in critical thinking skills in her own research which concurred with previous studies (Bauwens & Gerhard, 1987; Sullivan, 1987; Matthews & Gaul, 1979; Dungan, 1986). Studies by Frederickson and Mayer (1977) and Scoloveno (1981), however, supported the positive impact of nursing education upon critical thinking abilities.

Purpose of the Study

The proposed study was designed for the following purposes: to describe critical thinking relevant to the discipline of nursing as viewed by nurse educator experts; to describe current practice regarding methods of measurement of critical thinking skills in baccalaureate nursing programs; and to present a model for evaluation of critical thinking
skills in nursing education that incorporates recommendations from the current literature and prevailing practice in baccalaureate schools of nursing, and meets the required outcome criterion of the accrediting body.

Dissertation Organization

A general review of the literature will precede the main sections of the dissertation. The literature review will address literature pertinent to critical thinking, in general and as related to nursing practice and education, measurement or evaluation of critical thinking skills, and specialized accreditation for baccalaureate nursing programs.

Three articles will be presented so as to be suitable for publication in a professional journal in nursing, Journal of Nursing Education. The candidate will be the primary author of each article.

The first article will describe a framework for critical thinking as viewed by nurse educators in baccalaureate schools of nursing. The second article will describe prevailing practices regarding the definition and methods of measurement of critical thinking skills in baccalaureate schools of nursing. The third article will present a model for the evaluation of critical thinking in nursing education.

A summary and discussion of the entire dissertation will
follow the articles and include recommendations for future studies. References cited in the general introduction and the general review of the literature, as well as the references for the articles, follow the summary and discussion. This research was approved by the Iowa State University Human Subjects Review Committee.
CHAPTER 1. GENERAL REVIEW OF THE LITERATURE

Introduction

In this chapter, literature related to critical thinking in general will be reviewed, as well as that specific to nursing practice and education. Then, literature related to measurement and evaluation of critical thinking skills will be reviewed, followed by the specialized accreditation process for nursing education identifying critical thinking as a required outcome for baccalaureate schools of nursing.

Critical Thinking

In September of 1989, at an educational summit in Charlottesville, Virginia, President George Bush and the United States' governors declared that the time had come to establish clear national performance goals to make the United States internationally competitive. Six national goals were developed and approved with a target date of the year 2000. They are as follows:

1. All children will start school ready to learn.
2. The high school graduation rate will increase to at least 90 percent.
3. Students will leave grades 4, 8, and 12 having
demonstrated competence in challenging subject matter including English, mathematics, science, history, and geography; every school will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment.

4. U.S. students will be first in the world in science and mathematics achievement.

5. By the year 2000, every adult American will be literate and possess the knowledge and skills necessary in a global economy and exercise the rights and responsibilities of citizenship.

6. Every school will be free of drugs and violence and will offer a disciplined environment conducive to learning. (United States Department of Education, 1990, pp. 8-9)

Corallo (1990) identifies objective 5 under goal 5 in reference to college-level learning: "The proportion of college graduates who demonstrate an advanced ability to think critically, communicate effectively, and solve problems will increase substantially" (p. 5). Goal 5.5 provides the underpinning for this study.

Wales, Nardi, and Stager (1986) state there is a "call for a new paradigm based on the thinking skills that make knowledge useful...but the pendulum can’t swing toward a new
paradigm based on thinking until appropriate skills have been defined" (p. 37-38). An abundance of definitions are found in the literature that vary from being specific, primarily cognitive in nature, and limited in scope to the more broad definitions encompassing both cognitive and affective domains, and having application to life areas outside a discipline or field of knowledge.

Wales, Nardi, and Stager (1986) write that the definition of a quality education should include the "ability to think critically, to analyze issues, to formulate solutions to problems, and to ask and seek answers to questions" (p. 37). They describe critical thinkers as being able to: objectify thought; weigh, reconcile, and assess contradictory arguments and points of view; make assumptions and recognize the assumptions of others; make inferences; interpret statements and decide if the conclusions follow logically; use deduction; and demand evidence. Good decision making is an outcome of critical thinking as seen by these authors.

Siegel (1980) views critical thinking as "a central ideal of educational endeavor" (p. 7) that is rational, principled thinking that is objective, impartial, nonarbitrary, and is based on evidence of an appropriate kind and properly assessed. In addition to the cognitive skills required to be a critical thinker, Siegel (1980) believes a critical attitude or spirit is necessary, the character of which goes beyond
cognitive abilities and includes the "willingness, commitment, and disposition to develop the habits of inquiry" (p. 9).

Ennis (1985) views critical thinking as a "practical activity - reflective and reasonable thinking that is focused on what to believe or do" (p. 45). He believes his definition is not as narrow as other popular definitions, but is not as vague a term as higher-order thinking skills which he conceptualizes as the higher levels of Bloom's taxonomy.

Yinger (1980) sees critical thinking as the cognitive activity associated with the evaluation of products of thought, using many of the same steps involved in problem solving and general intelligence. McPeck (1981) sees critical thinking as "the propensity and skill to engage in an activity with reflective skepticism" (p. 8). He believes it is a particular type of thinking within a specified area of knowledge and expertise. Halpern (1984) distinguishes thinking that is purposeful and goal directed and thinking that underlies our daily routines. She calls the former critical thinking because it solves a problem, makes an inference, or arrives at a decision.

Norris (1985) believes that critical thinking is an "indispensable part of education...a necessary condition for being educated. Being a critical thinker implies assesssing the views of others and one's own views according to acceptable standards of appraisal" (p. 40). He continues by
saying that one must be productive, produce reliable observations, make sound inferences, and offer reasonable hypotheses. Norris also sees the disposition to think productively and critically about issues as equally important as the ability to do so. He supports the premise that critical thinking must be taught within a subject area to be effective.

Paul disputes the premise that critical thinking must be related to an identified subject area. Paul (1985) states that "we must not allow our models of critical thinking to be principally drawn from the kind of specialized, compartmentalized thinking that is dominant in the technical disciplines" (p. 46).

Kurfiss (1988) believes that critical thinking is "an investigation whose purpose is to explore a situation, phenomenon, question, or problem to arrive at a hypothesis or conclusion about it that integrates all available information and that can therefore be convincingly justified" (p. 2). She views critical thinking as a form of problem solving, with problem solving being more narrow in scope.

In contrast, Walters (1987) states that "critical thinking is a problem solving technique" (p. 96) that can lead to exclusive use of reductionistic methods. Walters believes that students may then see intuitive and nonanalytic expressions as sloppy, and disregard realization of their
creative abilities, thus encouraging attitudes of intolerance toward imaginative, artistic, nonreductionistic expressions.

Garland (1991) believes that:
instructors take students' abilities to think critically, evaluate/synthesize information, and to communicate about a topic for granted rather than viewing the development of thinking/analytic skills as one of the most valuable aspects of undergraduate education. (p. 447)

He lists the elements of critical thinking as: differentiating between fact and opinion; recognizing and evaluating author bias and rhetoric; determining cause-and-effect relationships; determining the validity and reliability of the information presented; recognizing faulty reasoning; comparing and contrasting information and points of view; evaluating all the evidence and drawing logical conclusions; and appreciating and tolerating ambiguity.

Arons (1985) cites reasons for cultivating critical thinking skills including those of "quality of life, professional competence, the advance of the culture and society in general as well as the education of an enlightened democratic citizenry" (p. 148). Rather than define critical thinking, Arons (1985) lists processes that are included in critical thinking:

1. Consciously raising questions
2. Being aware of gaps in available information
3. Discriminating between observation and inference, between established fact and subsequent conjecture
4. Recognizing words as symbols for ideas, not ideas themselves
5. Probing for assumptions behind a line of reasoning
6. Drawing inferences from data, observations, or other evidence
7. Performing hypothetico-deductive reasoning
8. Discriminating between inductive and deductive reasoning
9. Testing one’s own line of reasoning and conclusions for internal consistency
10. Developing self consciousness concerning one’s own thinking and reasoning processes (pp. 143-147)

Watson and Glaser (1964) view critical thinking as a composite of attitudes, knowledge, and skills. Attitude refers to a frame of mind, an approach of intellectual curiosity that recognizes existing problems. Knowledge involves weighing the accuracy and logic of evidence, including the nature of valid inferences, abstractions, and generalizations. According to Watson and Glaser (1964) the skill in applying both attitudes and knowledge must be acquired through practice.

Brookfield (1987) conceives of critical thinking in a broad sense, believing that it can be:
recognized in the contexts of our personal relationships, work activities, and political involvements...thinking [that] entails much more than the skills of logical analysis taught in so many college courses on the subject. (p. 1)

Brookfield (1987) writes that critical thinking is:

- a productive and positive activity
- a process, not an outcome
- manifested in various ways, according to context
- triggered by both positive and negative events
- emotive as well as rational
- a lived activity, not an abstract academic pastime (pp. 5-7)

Brookfield identifies the components of critical thinking as:

- identifying and challenging assumptions; challenging the importance of context; imagining and exploring alternatives; and reflective skepticism. He summarizes his description of critical thinking with the observation that "it is something we all do, though its frequency, and the credibility we grant it, vary from person to person (1987, p. 14).

Paul (1993) views critical thinking as the "essential foundation for education because it is an essential foundation for adaptation to the everyday personal, social, and professional demands of the 21st Century and thereafter" (p. xi). He sees critical thinking as a systematic way to form
and shape one's thinking that functions purposefully and exactly, is disciplined, comprehensive, well-reasoned, and based on intellectual standards. Paul disagrees with the views that restrict critical thinking, or the teaching of critical thinking, to a specific discipline or content area. Paul describes critical thinking in a two-fold way: composed of elements of thought; and based on intellectual standards. The elements of thought, as identified by Paul (1993) are contained in the following questions he poses:

What is the purpose of my thinking?
What precise question am I trying to answer?
Within what point of view am I thinking?
What information am I asking?
How am I interpreting that information?
What concepts or ideas are central to my thinking?
What conclusions am I coming to?
What am I taking for granted, what assumptions am I making?
If I accept the conclusions, what are the implications?
What would the consequences be, if I put my thought into action? (p. 22)

The intellectual standard to which Paul refers include those such as relevance, accuracy, precision, clarity, depth, and breadth (1993, p. 22). Thinking that does not incorporate elements of reason, and is not based on intellectual standards
results in "pseudo critical thinking" (Paul, 1993, p. 47) which he believes is abundant on college campuses.

McMillan wrote in 1987 that one of the things lacking in the research related to critical thinking "is a common definition of critical thinking" (p. 3). That lack is still evident at this time.

Critical Thinking in Nursing

"The demonstration of critical thinking is a universally expected behavior of professional nurses engaged in practice" (Kemp, 1985, p. 382). She further states that critical thinking is an essential component of communication, problem-solving, research endeavors, as well as a prerequisite to the theoretical and conceptual understanding of nursing concerns.

Schank (1990) writes that "knowing how to think, apply, analyze, synthesize, and evaluate are crucial skills for nursing professionals" (p. 86). The diversity and complexity in nursing practice make it necessary to prepare nurses who can think creatively and critically, and who have a sound education in nursing, science, and the humanities. However, Schank (1990) expresses concern that the focus in nursing education is on the transmission of information rather than the development of critical thinking. She believes that a primary objective of education is to impart the skills of
learning and prepare the learner for lifelong learning, and questions how well nursing programs are meeting that objective.

Pless and Clayton (1993) write:

nurses need a solid knowledge base in addition to demonstrating an ability to think critically. Justifiably, nurses have jumped on the bandwagon of critical thinking. Once on the bandwagon, however, the elusive butterfly of critical thinking has been difficult to net. (pp. 427-428)

Pless and Clayton (1993) report that Facionne in 1990 used the Delphi method with a panel of experts to work toward a clear conceptualization of critical thinking. The panel identified two dimensions of critical thinking in their conceptualization: cognitive skills and affective dispositions. Pless and Clayton (1993) believe the majority of studies using standardized tests to measure critical thinking focus almost exclusively on the cognitive skills nurses need, and often fail to find significant correlations between critical thinking and clinical judgment because the affective disposition is not recognized, studied, or measured.

Meyers (1986) found that problem solving is often used as a primary method for teaching critical thinking. Problem solving courses attempt to communicate an objective, empirically based form of analysis which Meyers (1986)
believes is important, but will not necessarily result in the ability to think critically.

Miller and Rew (1989) refer to the adoption of nursing process in the 1960s as the method of clinical judgment in nursing practice. They believe that "adherence to teaching clinical judgment as an analytic, linear process, exclusive of more holistic modes of thinking" (p. 84) has gone unquestioned by nursing education (Miller & Rew, 1989). These authors cite studies by Henderson, 1982; Benner and Tanner, 1987; Tanner, 1987; Brooks and Shepherd, 1990, all of which question the exclusive use of logical, linear, analytic modes of thinking, such as nursing process, in teaching clinical judgment. Miller and Rew (1989) advocate the inclusion of intuition or synthesis in the process of making clinical judgments, and therefore in the education of nursing students. Tanner (1986) questions the effectiveness of written nursing care plans as a teaching tool since no evidence exists to support a relationship between the written plans and the ability to make sound clinical decisions.

Jenks (1993) describes clinical decision making as a highly complex skill that entails both cognitive and intuitive processes. She states that educational efforts focused on clinical decision making should include "skill building in cognitive, intuitive, and interpersonal skill" (p. 404).

Case (1994) believes that critical thinking
characteristics match those needed in clinical decision making, though she acknowledges that empirical evidence does not clearly support that correlation. She further describes critical thinking in nursing roles such as management, consultation, continuing education, and staff development, all of which require advanced education and/or experience beyond the scope of the undergraduate student or newly graduated nurse. Tschikota (1993) found that it is characteristic of the novice [student] to assign equal value to each piece of data and make decisions based on facts rather than hypotheses which is more characteristic of problem solving, thereby failing to demonstrate what is commonly believed to be critical thinking abilities.

Bowers and McCarthy (1993) write that a central purpose of nursing education is to "facilitate the development of the students' ability to use theory and/or knowledge effectively across a variety of clinical settings" (p. 107). As students learn to be effective practitioners in the clinical setting, it is essential for them to apply or contextualize course content, that is, to recognize that psychosocial and sociocultural considerations may transform a particular context, requiring a "different right answer" in terms of clinical judgment or decision making (Bowers and McCarthy, 1993). Bowers and McCarthy believe that for students to acquire the skills needed in clinical judgment, educators must
facilitate the development of higher-level thinking skills in both the classroom and the clinical setting. The importance of context is supported by King and Bella (1987) and Jenkins (1985) who state "a theoretical base is worthless without application in a clinical context" (p. 243).

Tanner (1993) believes that critical thinking has been conceptualized as something that it is not, such as problem solving or the nursing process, and cites this as a factor in explaining the failure of studies to show consistent correlation of critical thinking and clinical judgment (Tanner, 1977; Gunning, 1981), or a very weak correlation (Brooks and Shepherd, 1990). Jones and Brown (1991) found that in nursing education, "critical thinking is conceptualized as a variant of the scientific method, a rational-linear problem-solving activity, which reflected the nursing process" (p. 529).

Bevis (1993) identifies the need to include critical thinking skills in nursing curricula, stating that critical thinking is one of the components that compose the substructure of nursing. She writes that "nurses too often confuse problem solving or nursing process and critical thinking" (Bevis, 1993, p. 104). Bevis believes that critical thinking must be taught in a reality context and should be based on the realities of nursing practice.

Kramer (1993) states that "critical thinking requires
attitudes of openness and inquisitiveness as well as factual and other forms of empirically grounded information relevant to nursing" (p. 406). She believes that the focus of critical thinking is usually broader than seeking a solution to a problem.

Kintgen-Andrews (1991) reviewed previous studies on critical thinking skills in nursing and found inconsistent results. She writes (1991):

The heavy emphasis on nursing process would lead to the expectation that involvement in nursing education would enhance one's critical thinking ability. Likewise, one would expect that strength in critical thinking would impact upon nursing performance, particularly in terms of clinical judgment. (p. 152)

Kintgen-Andrews (1991) concludes, in part, that critical thinking is more complex than the construct that is commonly measured.

Studies designed to discover differences in critical thinking ability based on level of academic preparation have varied results. Matthew and Gaul (1979) found no significant difference between the Watson-Glaser Critical Thinking Appraisal (WGCTA) scores of 26 graduate nursing students and 22 undergraduate nursing students. Dungan (1986) found no significant difference between the scores on the Cornell Critical Thinking Test (CCTT) for 23 entering freshmen
students, 31 associate degree nursing students, and 43 senior baccalaureate nursing students. However, Frederickson and Mayer (1977) found that baccalaureate nursing students had significantly higher critical thinking scores than associate degree nursing students. Pardue's (1987) results indicate that nurses with master's and baccalaureate degrees had significantly higher critical thinking scores than associate degree or diploma prepared nurses, but there was no significant difference among the four groups with regard to decision making skills.

Studies designed to measure curricular impact on critical thinking in nursing in terms of "gain or change" scores have inconsistent results. Berger (1984) found a significant difference in the WGCTA scores of 137 baccalaureate nursing students when the test was administered in the sophomore year and again in the senior year. Gross, Takazawa, and Rose (1987) studied the differences in WGCTA scores of 37 associate degree students as they entered and exited the program, and 34 baccalaureate students as they began and completed the upper division nursing courses. They found significant differences in the entrance and exit scores for both groups.

Bauwens and Gerhardt (1987) administered the WGCTA to 53 nursing students as they entered the nursing major, and again near the completion of upper division courses and found no significant difference between the two scores. Kintgen-
Andrews (1988) found no significant difference in scores on the WGCTA measured at the beginning and end of an academic year for 177 students. The students in this study were in a variety of programs: practical nursing; associate degree nursing; generic baccalaureate nursing; and prehealth science in a university setting.

Some studies have found that critical thinking is positively correlated with other attributes, such as moral reasoning (Ketefian, 1981), and academic aptitude, academic experience, and academic performance (Tiessen, 1987). However, Cornett (1977) found no relationship between nursing students' critical thinking ability and aptitude variables. Scott (1983) found that critical thinking abilities were negatively affected as anxiety levels increased.

### Instrumentation and Measurement

Numerous studies of critical thinking in nurses and/or nursing students employ standardized, paper-and-pencil tests such as the Watson-Glaser Critical Thinking Appraisal (WGCTA) (Bauwens & Gerhard, 1987; Gross, Takazawa, & Rose, 1987; Kintgen-Andrews, 1988; Matthews & Gaul, 1979; Pardue, 1987).

The Watson-Glaser Critical Thinking Appraisal was developed in 1964, and consists of 80 objective items, grouped with situations about problems in everyday life (Watson &
Glaser, 1964). The WGCTA is divided into 5 subtests designed to measure related, but different aspects of critical thinking: inference; recognition of assumptions; deduction; interpretation; and evaluation of arguments. The scores for each subtest are equally weighted to comprise the total score. McMillan (1987) suggests that the WGCTA may be unable to identify the influence of an academic major on critical thinking abilities due to its general, broad based construction. McMillan (1987) cites identified limitations of the WGCTA including construct validity and normalization data, stating that "there may be sufficient technical limitations to significantly weaken research that uses this measure" (p. 10). McMillan concludes that it is "simply very difficult to demonstrate change in a broad, general construct, which is influenced by many factors over a long period of time by altering one, relatively small factor" (1987, p. 10).

Pless and Clayton (1993) state that "lack of valid instrumentation may be one reason why nurse researchers have found little correlation of critical thinking with concepts such as decision making and clinical judgment" (p. 426). Kintgen-Andrews (1993) believes it would be appropriate for nurse educators "to monitor research related to the development of critical thinking, explication of a more inclusive definition of the construct, and the development and refinement of measuring instruments" (p. 156).
Many of the previously cited studies used a standardized pre- and posttest format, and called the difference between the two scores a "gain" score. Hanson (1988) outlines some of the psychometric problems encountered when attempting to measure "change" in students. For example, instruments designed to measure a particular attribute are static, and there is a high correlation across two points in time if the measure is valid and reliable. Therefore, to pre- and posttest with the same instrument, and use the difference as a "change" score either yields few or no measurable results of change, or calls into question the reliability and validity of the instrument if the change score is significant.

Use of pre- and posttest scores upon entry into college and graduation, respectively, ignores the pattern of change, or movement of the student within the four years. Pascarella and Terenzini (1991) found that initial declines, in the first year, were common among students in the literature they reviewed. The use of residual gain scores, though attempting to avoid the problems of simple gain scores, can yield a bias resulting from the inability to differentiate the contribution of input variables from the results of the intervention to the significance of the score.

Lumsden and Knight (1991) recommend that faculty develop their own outcome assessment instruments and that multiple measures should be used. El-Khawas (1991) writes that local
instruments are more strongly preferred to provide specific data to the institution, not only for outcomes assessment, but use in program evaluation and improvement. Use of individualized, locally developed instruments can enhance the institution's ability to measure outcomes based on its mission and objectives in a meaningful way (El-Khawas, 1991; Lumsden & Knight, 1991; Moore, 1986). Lenning (1988), Lumsden and Knight (1991), Smith and Weith (1985), and Wilcox and Ebbs (1992) support the concept of assessing value-added measures, such as critical thinking, in concert with assessment of academic achievement.

Terenzini and Pascarella (1991) included the following in the summary of their recommendations for future assessment studies: differentiation of changes that occur during college versus those that occur due to college; estimation of the magnitude of those changes; examination of when those changes occur; the effect of student characteristics on changes; increased focus on the effects of the academic program; the experiences of minority and older students; and the increased use of qualitative methods in addition to quantitative methods.

Hanson (1988) proposes the use of hierarchical, linear models to study the process of change. He writes:

This technique is based on regression analysis and can be used to study the structure of individual growth and the
reliability of instruments for measuring status and change, assessing the correlates of status and change, and testing the hypotheses about the effects of background variables and educational interventions on individual growth. (pp. 60-61)

Hierarchical linear models (HLMs) involve two stages of analysis. Bork and Raudenbush (1987) write:

At Stage 1, each individual’s observed development is conceived of as a function of an individual growth trajectory plus random error. This trajectory is determined by a set of individualized parameters. At Stage 2, we assume that these individual parameters vary as a function of certain measurable characteristics of the individual’s background and environment. (p. 148)

Hanson (1988) describes the statistical advantages of HLMs as follows: no assumptions made about the nature of the growth curve; the same data do not have to be collected the same number of times for each individual; variations in growth curves across individuals can be represented by a fixed between-subjects equation, relating changes to individual’s backgrounds or educational experiences; and the between-subjects equation can be different for various growth parameters. Hanson (1988) states that the research design required to measure students’ growth and change must be carefully selected, and account for intentional interventions,
unintentional interventions, and maturation.

Fassinger (1990) supports use of a multivariate causal modeling technique to study complex constructs that are influenced by both attribute and achievement variables, as well as processes such as maturation. "Path analysis is a method for testing the validity of a theory about causal relationships between three or more variables that have been studied using a correlational research design" (Borg & Gall, 1989, p. 613).

Gothler and Hanner (1991) advocate use of triangulation with a combination of measurement approaches for complex constructs that lack precise definition, and write:

The triangulation model is based on the idea that through multiple methods we can more clearly understand the construct under study, and thereby increase the validity of the measurement. Advocates of triangulation support a multioperational, multimethod paradigm with the view that the whole is greater than the sum of its parts when both qualitative and quantitative approaches are used. (p. 115)

Accreditation for Baccalaureate Nursing Programs

Kramer (1993) writes "clearly, nurse educators must be concerned with the development of critical thinking skills"
particularly in light of newly agreed-upon criteria of the National League for Nursing, one of which required the establishment of critical thinking as an outcome criterion to be measured. The National League for Nursing (NLN) is the nationally recognized agency for the specialized accreditation of nursing programs.

The NLN Accreditation Program is founded on the belief that specialized accreditation provides for the maintenance and enhancement of educational quality, provides a basic assurance of program improvement, and contributes to the improvement of nursing practice (NLN, 1992, p. v).

The NLN accredits all types of nursing programs, and has a council for each type of program: practical nursing programs, associate degree nursing programs, diploma nursing programs, and baccalaureate and higher degree nursing programs. The individuals and agencies for each of the councils approve all matters pertaining to their specific council, including evaluation criteria. In 1989, the Council for Baccalaureate and Higher Degree Programs in Nursing approved changes in the criteria for accreditation. Included in the changes was the designation of a criterion identifying critical thinking as a required outcome for graduates of baccalaureate nursing programs (NLN, 1992, p. 26).

The accreditation process consists of preparation of a
self-study report by the nursing program, an on-site visit by a team of peers from the council of baccalaureate and higher degree nursing programs, and an evaluation by the NLN review board. The preparation of the self-study report requires the faculty and administration of the nursing program to document and evaluate their achievement of the criteria for the evaluation of baccalaureate and higher degree nursing programs as approved by the council and published by the NLN.

Required Outcome 1: Critical Thinking states "This outcome reflects students' skills in reasoning, analysis, research, or decision making relevant to the discipline of nursing" (NLN, 1992, P. 26). For the self-study report, the nursing program must document the following:

A. Give the nursing unit’s definition of critical thinking appropriate to each nursing program.
B. Provide a rationale and assessment of methods or processes used to evaluate or measure critical thinking.
C. Report critical thinking outcome data and its use in the development, maintenance, and revision of program/s. (NLN, 1992, p. 26)

The newly revised criteria were optional for baccalaureate nursing programs scheduled for an accreditation site visit in the fall semester of 1992 and the spring semester of 1993. Nursing programs are required to use the
revised criteria beginning with accreditation visits scheduled for the fall semester of 1993, and thereafter.

Summary

This literature review has explored references related to critical thinking with emphasis on application of those skills in nursing practice, and therefore, implications for nursing education.

Initially, the literature on the construct of critical thinking in general was discussed. The review of this literature discovered a general consensus on the value of critical thinking abilities, but a wide range of definitions or conceptions of the construct.

The literature provides support for professional registered nurses to use critical thinking skills in practice, and therefore defines a need for nursing educators to teach critical thinking skills to nursing students. However, there is no general consensus on the meaning of critical thinking or its relationship, if any, to clinical judgment or decision making.

The specialized accreditation process for baccalaureate programs of nursing was discussed with emphasis on the newly adopted required outcome related to critical thinking abilities of graduates relevant to the discipline of nursing.
This review of the literature provides the necessary foundation for a descriptive study that describes critical thinking as viewed by expert nurse educators, identifies prevailing practices regarding the definition and evaluation of critical thinking abilities in baccalaureate programs of nursing, and proposes a model that utilizes critical thinking concepts relevant to nursing practice and serves as a model for nursing educators that can effectively be used for program evaluation, development, and maintenance related to critical thinking.
CHAPTER 2. CRITICAL THINKING: HOW IT IS DESCRIBED BY NURSE EDUCATORS

A paper to be submitted to the *Journal of Nursing Education*

Sheila L. Videbeck, RN, MS

Abstract

This is a descriptive study designed to describe critical thinking relevant to the discipline of nursing as viewed by nurse educators. Deans and Directors of 345 NLN accredited 4-year baccalaureate schools of nursing were invited to select the faculty member best able to respond to a survey questionnaire on critical thinking in nursing. One hundred twenty-two respondents participated in the study, providing their own expert beliefs and ideas about critical thinking, not necessarily those of other faculty and/or the nursing program. Content analysis methods were used to discover any areas of consensus among the nurse educators responding to the survey questionnaire. Ninety-one (76%) indicated that critical thinking should include both cognitive abilities and affective qualities, while 43% of the respondents listed needed abilities for critical thinking in both domains and 31% of critical thinking definitions included both domains. Little discrimination among activities such as clinical judgment, problem solving, and decision making as examples of
critical thinking was found. The significance of context or the complexity of the situation was identified by 25% of the respondents as a factor influencing if an activity required critical thinking abilities.

Introduction

The ability to think critically has been identified as essential in nursing practice (Kemp, 1985; Tiessen, 1987; Burnard, 1989; Kramer, 1993; Case, 1994), and therefore, has become a central concern of nurse educators (White, Beardslee, Peters, & Supples, 1990; Jones & Brown, 1991; Bevis, 1993; Hartley & Aukamp, 1994). The establishment of a required outcome criterion for critical thinking as part of the accreditation process by the National League for Nursing (NLN) for baccalaureate nursing programs has further emphasized the need to foster the development of critical thinking abilities of nursing students. Yet, nurse educators struggle with the formidable tasks of defining critical thinking in nursing practice, designing learning experiences to provide opportunities for practicing critical thinking, and evaluating the outcome of those efforts for purposes of program evaluation. Pless and Clayton summarized this struggle, "Justifiably, nurses have jumped on the bandwagon of critical thinking...once on the bandwagon, however, the elusive butterfly of critical thinking has been difficult to net"
This article will examine the views of nurse educators on critical thinking relevant to the discipline of nursing.

The Critical Thinking Debate

Miller and Malcolm (1990) cite numerous definitions of critical thinking noting "there is considerable discussion and little agreement on the meaning of critical thinking" (p. 67). Many definitions of critical thinking are found in the literature that vary from being specific, primarily cognitive in nature, and limited in scope to the broader definitions encompassing both cognitive and affective domains, and having application to life outside a discipline or field of knowledge.

Critical thinking as a primarily cognitive process is often likened to problem solving (Yinger, 1980; Walters, 1987; Kurfiss, 1988), decision making (Halpern, 1984; Wales, Nardi, & Stager, 1986), moral reasoning (Ketefian, 1981), and the nursing process (White et al., 1990; Wilkinson, 1991). This point of view is well represented by Ennis' conception of critical thinking as a "practical activity - reflective and reasonable thinking that is focused on what to believe or do" (1985, p. 45). Specific abilities or activities employed by critical thinkers vary somewhat, but usually include recognizing assumptions, making inferences, using inductive
and deductive reasoning, weighing evidence, generating hypotheses, supporting points of view, and evaluating the credibility of one's decision, solution, belief, or action. The simplicity or complexity of the situations where critical thinking is used is often omitted, and the difficulty posed by the decision to be made or the problem to be solved is not addressed. This omission can lead to the conclusion that all decision making or problem solving opportunities require critical thinking abilities.

In addition to the necessary cognitive skills, many conceptions of critical thinking include a strong affective component that is also seen as necessary for the critical thinker. This is described as a disposition or willingness to think critically, intellectual curiosity, an attitude of openness, and/or a spirit of inquiry (Watson & Glaser, 1964; Siegel, 1980; Norris, 1985; Brookfield, 1987, Paul, 1990). The problem presented by the inclusion of affective characteristics or attitudes is the dilemma of how to define and evaluate them accurately and effectively.

The discussion about cognitive vs. cognitive-affective components of critical thinking is not the only area of debate. Though agreement exists that knowledge is a prerequisite for a critical thinker, there is disagreement about whether critical thinking must exist within the confines of a discipline or identified field of knowledge (McPeck,
1981; Arons, 1985; Norris, 1985;) or if it should indeed apply to the broader aspects of life and society (Halpern, 1984; Brookfield, 1987; Paul, 1990; Bandman & Bandman, 1995).

Proponents of critical thinking within a subject area reason that without knowledge and expertise in a field, it is not possible to weigh evidence or evaluate the credibility of sources, much less make a critical judgment. In support of this position, Bevis (1993) believes that critical thinking must be taught in a reality context and should be based on the realities of nursing practice. The clearest criticism of discipline-specific critical thinking is made by Paul (1985), "we must not allow our models of critical thinking to be principally drawn from the specialized, compartmentalized thinking that is dominant in the technical disciplines" (p. 46). Even if it is believed that critical thinking is useful in all area's of one's life, it can be postulated that it is not possible to develop the needed life-long critical thinking skills within undergraduate nursing curricula.

Critical thinking in nursing practice is often related, at least theoretically, to clinical judgments or clinical decision-making. However, studies designed to provide empirical evidence to support this relationship have yielded inconsistent results. Factors identified in the failure of studies to show a consistent correlation between critical thinking and clinical judgment are plentiful. Kintgen-Andrews
(1991) reviewed previous studies on critical thinking skills in nursing, concluding, in part, that critical thinking is more complex than the construct that is commonly measured. Tanner (1993) believes that critical thinking has been conceptualized as something it is not, such as problem solving or the nursing process, a view that is supported by Meyers (1986), Jones and Brown (1991), Bevis (1993), and Kramer (1993). Jenks (1993) describes clinical decision making as a highly complex skill that entails both cognitive and intuitive processes. Miller and Rew (1989) advocate the inclusion of intuition and synthesis in the process of making clinical judgments and question the exclusive use of logical, linear, analytic modes of thinking, such as nursing process, in teaching clinical judgment, as do Benner and Tanner (1987). Pless and Clayton (1993) believe the majority of studies using standardized tests to measure critical thinking focus almost exclusively on the cognitive skills nurses need, and do not recognize, study, or measure the affective component of critical thinking.

While the debate on critical thinking continues, nurse educators wrestle with mandates to define critical thinking, evaluate students' abilities to think critically within the discipline of nursing, and use this outcome data for systematic program evaluation. This is in addition to actually promoting and fostering the development of critical
thinking abilities of nursing students. It is clear that these are formidable challenges given the current "state of the art" of critical thinking.

Methodology

The purpose of this study was to discover and describe consensus, or lack of consensus, among expert nurse educators with respect to critical thinking relevant to nursing. Areas of consensus among nurse educator experts could then be used to develop a framework of criteria to use in the examination of critical thinking outcomes assessment. The published list of NLN accredited baccalaureate schools of nursing was used to identify programs scheduled for an accreditation site visit no earlier than the 1994-95 academic year. Schools being visited for accreditation in the 1992-93 and 1993-94 academic years were identified for a subsequent study. Invitations to participate, and a follow-up postcard reminder, were sent to the Deans and Directors of 345 NLN-accredited, 4-year, baccalaureate schools of nursing located in 47 states, the District of Columbia, Puerto Rico, and the Virgin Islands, asking them to identify the faculty member who could best respond to a survey questionnaire on critical thinking. Consent to participate in the study was a returned, completed survey questionnaire. One hundred twenty-two questionnaires were received from schools representing all but 9 of the
states, district, commonwealth or territory identified in the population. The sample was representative of the population with respect to affiliation of the college or university, i.e., religious, private, or public, and the number of enrolled nursing students as supported by a Chi-square test for homogeneity, or "goodness-of-fit". Due to the low response rate of thirty-five percent, telephone contact was made with approximately ten percent (n=25) of the nonrespondants to determine reasons for nonparticipation. Fifteen indicated the questionnaire was too time consuming, five stated the individual best able to participate was unavailable to do so, and five stated the nursing program had not yet made these decisions regarding critical thinking.

The survey questionnaire consisted of four open-ended items and four items with lists from which respondents could select all choices that applied. On the open-ended items respondents were asked to: list essential skills/abilities involved in critical thinking; define critical thinking; identify critical thinking as primarily cognitive, affective, or both, and why; and identify how critical thinking skills are evidenced in nursing practice. The choice items asked respondents to: discriminate between critical thinking and six activities, such as problem-solving and decision-making; identify the level(s) at which critical thinking should appear in the curriculum; identify when critical thinking should be
evaluated; and select the type of evaluation activity(s) that should be used. Content analysis methods were used to analyze the data.

Findings

The first question concerned the skills, abilities, and concepts involved in critical thinking for baccalaureate nursing students. Seventy-seven respondents identified cognitive abilities while fifty-two respondents listed both cognitive and affective abilities. Reasoning skills, problem-solving, analysis, and decision-making were identified most frequently (Table 1). Affective components of being open-minded and intellectually curious or having a spirit of inquiry were most frequently identified (Table 2).

The respondents were asked to define what critical thinking should be for graduates of nursing programs. Seventy respondents gave definitions containing only cognitive abilities, thirty-eight respondents included both cognitive abilities and affective qualities, and fourteen did not respond to the item, or responded to the item without providing a definition. Thirty-one of the one-hundred and eight definitions were adopted from authors in the field of critical thinking. The content of the other seventy-seven definitions mirrored the skills, abilities, and concepts identified in the first question.
Table 1. Frequency with which cognitive abilities were listed

<table>
<thead>
<tr>
<th>Cognitive ability</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasoning skills</td>
<td>44</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>32</td>
</tr>
<tr>
<td>Analysis</td>
<td>29</td>
</tr>
<tr>
<td>Decision-making</td>
<td>27</td>
</tr>
<tr>
<td>Discriminate/prioritize</td>
<td>22</td>
</tr>
<tr>
<td>Nursing process</td>
<td>17</td>
</tr>
<tr>
<td>Synthesis</td>
<td>16</td>
</tr>
<tr>
<td>Recognize context/multiple perspectives</td>
<td>15</td>
</tr>
<tr>
<td>Clinical judgments</td>
<td>14</td>
</tr>
<tr>
<td>Communication/organizational skills</td>
<td>11</td>
</tr>
<tr>
<td>Research/generate hypotheses</td>
<td>6</td>
</tr>
</tbody>
</table>

Concerning the domains of critical thinking, ninety-one indicated that both cognitive and affective domains should be included, fifteen believed critical thinking was primarily the cognitive domain, and no respondent thought it should be primarily affective in nature. Six respondents wrote that critical thinking should include the cognitive, affective, and psychomotor domains, four wrote that critical thinking should be holistic, and six respondents did not answer this question.

The fourth open-ended question asked respondents how
Table 2. Frequency with which affective qualities were listed

<table>
<thead>
<tr>
<th>Affective quality</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-minded</td>
<td>17</td>
</tr>
<tr>
<td>Intellectual curiosity/spirit of inquiry</td>
<td>16</td>
</tr>
<tr>
<td>Self-reflection</td>
<td>6</td>
</tr>
<tr>
<td>Fair</td>
<td>4</td>
</tr>
<tr>
<td>Self-confident</td>
<td>3</td>
</tr>
<tr>
<td>Flexible</td>
<td>2</td>
</tr>
<tr>
<td>Healthy skepticism</td>
<td>2</td>
</tr>
<tr>
<td>Other: tolerate ambiguity, seeks meaning, shows care &amp; concern</td>
<td>4</td>
</tr>
</tbody>
</table>

critical thinking is most often evidenced in nursing practice. Forty-eight percent indicated that critical thinking in nursing practice was most often evidenced through use of the nursing process and thirty-one percent identified clinical judgments or decisions as the principal evidence of critical thinking in practice. Complex or nonroutine situations were identified by nineteen percent of the respondents as activities requiring critical thinking (Table 3).

The questionnaire listed six activities, decision-making, problem-solving, resolution of ethical dilemmas, use of the nursing process, clinical judgments, and creative thinking, and asked respondents to identify those activities that were
Table 3. Evidence of critical thinking in nursing practice

<table>
<thead>
<tr>
<th>Nursing practice activities</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing process</td>
<td>59</td>
</tr>
<tr>
<td>Clinical judgments/decisions</td>
<td>38</td>
</tr>
<tr>
<td>Complex or nonroutine situations</td>
<td>23</td>
</tr>
<tr>
<td>Administrative or management</td>
<td>17</td>
</tr>
<tr>
<td>Research</td>
<td>9</td>
</tr>
<tr>
<td>Ethical dilemmas/discussions</td>
<td>8</td>
</tr>
<tr>
<td>Other responses</td>
<td>6</td>
</tr>
</tbody>
</table>

examples of, or synonymous with critical thinking. Sixty-five respondents selected all six of the activities, while eleven selected none of them. The number of times each activity was selected is shown in Table 4. Thirty-one respondents qualified their response by indicating that it would depend on the situation, i.e., if it were a complex situation some of these activities might be an example of critical thinking, but a simple situation would not require critical thinking. This qualification was made by all eleven respondents that selected none of the activities, as well as twenty respondents choosing from one to six activities.

Respondents were asked to identify where critical thinking should be identified in the nursing curriculum, given a list of five choices, marking all that applied (Table 5).
Table 4. Frequency with which listed activities were selected as examples of critical thinking

<table>
<thead>
<tr>
<th>Activities</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical judgments</td>
<td>102</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>96</td>
</tr>
<tr>
<td>Decision-making</td>
<td>95</td>
</tr>
<tr>
<td>Resolution of ethical dilemmas</td>
<td>95</td>
</tr>
<tr>
<td>Creative thinking</td>
<td>93</td>
</tr>
<tr>
<td>Use of the nursing process</td>
<td>87</td>
</tr>
</tbody>
</table>

Respondents were asked to identify where critical thinking should be identified in the nursing curriculum, given a list of five choices, marking all that applied (Table 5).

Respondents were asked to indicate when critical thinking abilities of nursing students should be evaluated, from a list of 7 measurement points. Thirty-three of the respondents selected 1 or 2 measurement points, fifty-one selected 3 or 4 measurement points, twenty-six selected 5, 6, or 7 measurement points, while ten respondents indicated they were undecided. The frequency with which each of the 7 measurement points were selected is indicated in Table 6.

The last question asked respondents to select the ways in which critical thinking should be evaluated or measured for nursing students and/or graduates. Five categories, or types
Table 5. Where critical thinking should be identified in the curriculum

<table>
<thead>
<tr>
<th>Level of identification</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum Objectives</td>
<td>111</td>
</tr>
<tr>
<td>Course Objectives</td>
<td>104</td>
</tr>
<tr>
<td>School or Program Goals</td>
<td>96</td>
</tr>
<tr>
<td>Program Philosophy</td>
<td>80</td>
</tr>
<tr>
<td>Course Descriptions</td>
<td>68</td>
</tr>
<tr>
<td>Other: Class/clinical objectives and evaluative criteria</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 6. Frequency of selected measurement points

<table>
<thead>
<tr>
<th>Measurement points</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry into College or University</td>
<td>53</td>
</tr>
<tr>
<td>Entry into nursing major</td>
<td>64</td>
</tr>
<tr>
<td>End of course(s)</td>
<td>34</td>
</tr>
<tr>
<td>Periodically throughout the nursing major</td>
<td>73</td>
</tr>
<tr>
<td>Upon completion of the nursing major</td>
<td>66</td>
</tr>
<tr>
<td>Just prior to graduation</td>
<td>44</td>
</tr>
<tr>
<td>Some time after graduation</td>
<td>33</td>
</tr>
<tr>
<td>Undecided</td>
<td>10</td>
</tr>
</tbody>
</table>
of measurement were provided with space to add additional categories. Eight respondents selected 1 category, fifty-eight selected 2 or 3 categories, forty-seven selected 4 or more categories of measurement and ten were undecided. Written course assignments, clinical performance tests, and course tests or examinations were the most frequently selected categories (Table 7).

Table 7. Frequency of selected measurement categories

<table>
<thead>
<tr>
<th>Measurement category</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written course assignments other than tests</td>
<td>104</td>
</tr>
<tr>
<td>Clinical performance tests or evaluations</td>
<td>88</td>
</tr>
<tr>
<td>Written course tests or examinations</td>
<td>80</td>
</tr>
<tr>
<td>Standardized tests</td>
<td>61</td>
</tr>
<tr>
<td>Locally developed instruments</td>
<td>21</td>
</tr>
<tr>
<td>Other</td>
<td>18</td>
</tr>
<tr>
<td>Undecided</td>
<td>9</td>
</tr>
</tbody>
</table>

In the category of standardized tests, nineteen respondents specified the California Critical Thinking Skills Test, seventeen respondents specified the Watson-Glaser Critical Thinking Appraisal, and seven specified the California Critical Thinking Disposition Inventory. Responses
added in the category of "other" included portfolios, logs, and journals over the course of the nursing major, case studies, clinical simulations, debates, and class activities or discussions.

Discussion

The content analysis demonstrated the greatest consensus among nurse educators concerning the domains in critical thinking. Ninety-one respondents, or 76% indicated that cognitive abilities and affective qualities should both be included, while fifteen, or 12% focused primarily on cognitive abilities. However, this was not congruent with the skills and abilities or definitions of critical thinking, where 43% and 31% respectively identified both cognitive abilities and affective qualities. This difference may indicate the difficulty in identifying or naming those affective qualities that educators believe are important to critical thinking. The various cognitive abilities and affective qualities in the skills/abilities list and the definitions of critical thinking were fairly representative of those consistently described in the literature. In fact, 28 respondents, or 23%, gave the same response to the item asking for a global definition as they gave to the item requesting a list of skills and abilities. It is interesting to note that nursing process and clinical judgments were the only nursing-specific abilities
noted, and were selected by seventeen and fourteen respondents respectively.

When identifying evidence of critical thinking in nursing practice, there was a noticeable division among the nurse educators. Some of the clusters of responses were comprised of nursing activities usually ascribed to a nurse with experience and/or education beyond that of a newly-graduated baccalaureate nurse, such as research, administrative or management activities. Additionally, twenty-three respondents indicated that critical thinking was evidenced in complex or nonroutine situations. The most frequent responses, use of nursing process and clinical judgments, did not qualify any conditions of the situations where these activities would occur, such as complexity or context. It was not possible to distinguish whether or not these respondents meant all clinical judgments and all applications of the nursing processes, or if they might have provided more specificity regarding the circumstances if the question had asked for qualifying data.

Clinical judgments was selected most often as an example of critical thinking which reflects the predominant thinking in the literature on critical thinking in nursing. However, all other five categories were frequently selected, indicating there is not necessarily a high level of discrimination among these activities. Thirty-one respondents, or 25%, did
discriminate on the context or complexity of the situation, rather than the specific type of activity. These respondents indicated that some or all of these activities might be examples of critical thinking if the situation was complex or multifaceted, but would not require critical thinking abilities if the situation were straight-forward or simple.

There was no consensus among the nurse educators on questionnaire items about where critical thinking should be identified in the curriculum, or when and how critical thinking abilities should be evaluated. This perhaps reflects the difficulty involved in trying to "net the elusive butterfly" of critical thinking (Pless & Clayton, 1993, p. 427-8). Since most respondents selected multiple choices on each of these three items, it may be further evidence that much uncertainty exists about when and how to evaluate students’ abilities to think critically.

In summary, the nurse educator experts in this study demonstrated consensus regarding the need for inclusion of both cognitive abilities and affective qualities in the construct of critical thinking for nursing. It is noted, however, that conception of critical thinking in nursing as occurring primarily in the cognitive domain is also acceptable, given the support in the literature for both cognitive and cognitive/affective definitions of critical thinking. The identified concepts, skills and abilities necessary for
critical thinking need to reflect the domains included in the definition, as well as the conception of critical thinking as both cognitive and affective. In other words, critical thinking needs to be operationally defined in terms of needed knowledge, skills, and abilities. There remains a need to distinguish critical thinking from simple problem solving, decision making, and use of the nursing process. As indicated by some of the respondents, the level of complexity, the context of the situation, or the need for multiple perspectives in some circumstances may be helpful in discriminating when critical thinking abilities are needed. This need for discrimination among nursing activities extends into the area of evidence of critical thinking in nursing practice, where again, complex or nonroutine situations may require critical thinking and simple situations do not. In addition, if nursing activities in management, administration, and research are the areas where nurses' critical thinking abilities are most prevalent, then nurse educators will need to decide what knowledge, abilities, and experiences as a nursing student would prepare the graduate to participate in these activities later in the nurses' career. It is possible that educators would decide that the ability to fully and effectively participate in areas of management and research requires education and experience beyond the undergraduate curriculum, and endeavor to provide the needed foundation for
further education in these areas.

Limitations

The design of the survey questionnaire may have been responsible, in part, for the lack of clarity or consensus of responses. The open-ended questions elicited very specific, detailed information from some respondents, and general comments from others. The items listing choices indicated that the respondent should mark all that applied, which can lead to all items being selected with a high frequency, thus limiting any ability to discriminate among the choices listed. The survey questionnaire was constructed for this study, so there are no data regarding reliability or validity.

The data were analyzed by the principal investigator only, therefore, the possibility of bias must be considered. Also, though the sample size was adequate (n=122), the number of completed questionnaires was only thirty-five percent.

Implications

The results of this study support the author’s belief that critical thinking in nursing, the necessary skills and abilities needed by students, and how and when to evaluate students’ critical thinking abilities is not yet clear in nursing education. Though the concept of critical thinking may not be, and perhaps should not be, identical in all
nursing programs, it seems to remain unduly vague and elusive at this time. Since nursing programs are being held accountable for outcome assessment of critical thinking for both student and program evaluation purposes, we need to make progress toward a conception of critical thinking in nursing that can be operationalized, tested, and supported empirically. This is particularly true if we in nursing believe that the acquisition of critical thinking abilities is one of the ways nursing will survive in the rapidly-changing health care environment of today.

References


CHAPTER 3. CRITICAL THINKING: PREVAILING PRACTICES IN BACCALAUREATE SCHOOLS OF NURSING

A paper to be submitted to the Journal of Nursing Education

Sheila L. Videbeck, RN, MS

Abstract

This study describes the prevailing practice of NLN accredited baccalaureate nursing programs with respect to the NLN required outcome criterion of critical thinking. Currently accredited four-year baccalaureate nursing programs scheduled for an accreditation site visit in the 1992-93 and 1993-94 academic years were invited to participate by providing a copy of the self-study report pages relevant to NLN Required Outcome Criterion 1: Critical Thinking. Of the 124 programs in the population, 55 used the newly approved accreditation criteria and provided the requested materials. This article describes the prevailing practices regarding the definition and evaluation/measurement of critical thinking.

Introduction

In recent years, the assessment of educational outcomes has received attention from a variety of constituencies. In 1988, policies of the regional accreditation associations for higher education were changed to reflect the emphasis on
outcomes assessment by requiring all institutions to develop and implement educational outcomes assessment plans. These accreditation criteria apply to schools of nursing that are located in colleges and universities. In addition, baccalaureate nursing programs are accredited by the National League for Nursing (NLN), using criteria developed and approved by the Council of Baccalaureate and Higher Degree Programs. The NLN is the nationally recognized agency for the specialized accreditation of nursing programs.

The NLN Accreditation Program is founded on the belief that specialized accreditation provides for the maintenance and enhancement of educational quality, provides a basic assurance of program improvement, and contributes to the improvement of nursing practice. (NLN, 1992, p. v)

In 1989, the nurse representatives of the Council of Baccalaureate and Higher Degree Nursing Programs of the NLN revised accreditation criteria to include outcome measures. One of these measures is "Required Outcome Criterion 1: Critical Thinking - This outcome reflects students' skills in reasoning, analysis, research, or decision making relevant to the discipline of nursing (NLN, 1992, p. 26). For the self-study report, which is a required component of the accreditation process, the nursing program must document the following:
A. Give the nursing unit’s definition of critical thinking appropriate to each nursing program.

B. Provide a rationale and assessment of methods or processes used to evaluate or measure critical thinking.

C. Report critical thinking outcome data and its use in the development, maintenance, and revision of program/s. (NLN, 1992, p. 26)

The newly revised criteria were optional for baccalaureate nursing programs scheduled for an accreditation site visit in the fall semester of 1992 and the spring semester of 1993. Nursing programs are required to use the revised criteria beginning with accreditation visits scheduled for the fall semester of 1993, and thereafter. With the implementation of the revised NLN criteria, it is timely to examine and describe the prevailing practice of baccalaureate nursing programs with regard to Required Outcome Criterion 1: Critical Thinking.

Evaluation of Outcomes

There is no universally accepted, all-inclusive framework or set of criteria by which to describe or evaluate an outcome measure of critical thinking. Pascarella and Terenzini (1991) made several recommendations for future assessment studies in higher education that included: differentiation of changes
that occur during college versus those that occur due to college; estimation of the magnitude of those changes; examination of when those changes occur; the effects of student characteristics on changes; and the increased use of qualitative in addition to quantitative methods. Lumsden and Knight (1991) recommend the use of multiple measures and locally or faculty-developed instruments. Use of individualized, locally developed instruments can enhance the institution’s ability to measure outcomes based on its mission and objectives in a meaningful way (Moore, 1986; El-Khawas, 1991). Smith and Weith (1985), Lenning (1988), Lumsden and Knight (1991), and Wilcox and Ebbs (1992) support the concept of assessing value-added concepts, such as critical thinking, in concert with academic achievement.

Paul (1993) outlines the recommendations for the assessment of higher order thinking from the Center of Critical Thinking:

1. Inclusion of the elements of thought to be assessed: purpose; question or problem; frame of reference; empirical and conceptual dimensions of reasoning; assumptions; implications and consequences; and inferences and conclusions.

2. Use of intellectual standards, such as accurate, clear, significant, fair, realistic, precise, and so forth.
3. Variety of assessment strategies, such as essays, multiple-choice, and multiple-rating items.

4. Delineation of affective traits, such as fair-mindedness, intellectual integrity, and willingness to suspend judgment.

Paul (1993) notes that use of commercially available, standardized tests present a two-fold problem. They are not based on a comprehensive model, and fail to take into account the recent scholarship on critical thinking.

A survey of nurse educators demonstrated consensus regarding the inclusion of both cognitive abilities and affective qualities in definitions of critical thinking, and raised the question of the need to identify the complexity of patient care situations, or the need to identify context when evaluating critical thinking abilities of nursing students (Videbeck, 1995).

The literature provides support for professional registered nurses to use critical thinking in practice, and therefore defines a need for nurse educators to teach critical thinking skills to nursing students. However, there is no general consensus on the meaning of critical thinking or its relationship, if any, to clinical judgment or decision making. Nursing is still seeking answers to those questions.
Methodology

The purpose of this study was to describe prevailing practice in baccalaureate schools of nursing with respect to NLN Required Outcome 1: Critical Thinking. The published list of NLN accredited baccalaureate schools of nursing was used to identify the nursing programs that were scheduled for an accreditation site visit during the 1992-93 and 1993-94 academic years. Invitations and a follow-up postcard reminder were sent to the Deans and Directors of 124 schools of nursing in 42 states asking them to participate by sending copies of the accreditation self-study report pages that pertained to NLN Required Outcome 1: Critical Thinking. Receipt of the requested materials was considered the consent to participate. Ninety-five programs, or 77%, responded to the letter or postcard. Thirty-one programs indicated that the previous NLN accreditation criteria had been used for the self-study which was an option for programs being visited during the 1992-93 academic year. Nine programs responded that they had used the newly-approved criteria, but declined to participate in the study. Fifty-five programs in 30 states submitted the materials requested. The 55 nursing programs in the sample represented the population of 124 nursing programs with respect to college or university affiliation, i.e., religious, public, or private, and the number of enrolled nursing students as demonstrated by a Chi-square test for homogeneity,
or "goodness-of-fit".

A framework of criteria to describe prevailing evaluation practices of critical thinking was constructed from recommendations in the higher education literature, the Center for Critical Thinking in Sonoma, CA (Paul, 1993), and a survey of nurse educator experts (Videbeck, 1995). This framework provided the initial structure for the content analysis of the data. The framework included:

Definition of critical thinking
- Primarily cognitive, or cognitive and affective
- Specified to discipline of nursing
- Source/author referenced or readily recognized

Critical thinking outcome
- Outcome stated
- Definition operationalized
- Outcome contained in program, curriculum or course objectives

Methods of measurement/evaluation
- Single or multiple types of measurement/evaluation
- Type(s) of measurement/evaluation used
- Timing of measurement

Rationale and assessment of methods/processes used

Use of outcome data for program evaluation

Additional criteria were developed as they emerged from the process of content analysis.
Findings

Analysis of the definitions of critical thinking showed that 43 definitions specified both cognitive abilities and affective qualities, while 12 were primarily cognitive in nature. Twenty-six of the definitions were specific to nursing, that is, they identified nursing activities or stated "relevant to nursing" or "in discipline or practice of professional nursing". Fifty of the definitions referenced adaptation or adoption of a particular author's critical thinking definition, or the source was readily identifiable (Table 1). Twenty-eight of the definitions originated in the nursing literature and twenty-two from authors writing about critical thinking not related to nursing specifically.

The definition of critical thinking in one program was operationalized to establish outcomes to be evaluated. Nineteen programs identified critical thinking outcomes as selected program and/or course objectives. Of these 19 programs, 8 used the term critical thinking in the objective(s), and 11 selected objectives related to critical thinking, such as problem solving and decision making.

Initial categories of types of measurements used in the analysis were: Standardized tests (widely or nationally recognized); locally developed instruments; and course specific measures, with subdivisions of clinical performance, written tests or examinations, and class or clinical written
Table 1. Source of Definition

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandman &amp; Bandman</td>
<td>11</td>
</tr>
<tr>
<td>Miller &amp; Malcolm (based on Watson &amp; Glaser)</td>
<td>10</td>
</tr>
<tr>
<td>Watson &amp; Glaser</td>
<td>8</td>
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<tr>
<td>Paul/Paul &amp; Scriven</td>
<td>8</td>
</tr>
<tr>
<td>Ennis</td>
<td>5</td>
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<tr>
<td>Wilkinson (based on Paul)</td>
<td>3</td>
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<tr>
<td>Matthews &amp; Gaul</td>
<td>2</td>
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<tr>
<td>Brookfield</td>
<td>1</td>
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<tr>
<td>Bowers &amp; McCarthy</td>
<td>1</td>
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<td>Kurfiss</td>
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</tbody>
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assignments. During data analysis, the category of capstone projects emerged. These were written and/or oral presentations during the last two semesters of the nursing major designed to demonstrate the cumulative knowledge and abilities of students integrated from the program of study rather than a specific course. Eighteen of the programs used one category or type of measurement and 37 used multiple (two or more) categories of measurement. The measurement categories and timing of measurement are presented in concert due to the relationship between the two factors.
Twenty-nine programs used 44 standardized tests to evaluate students' critical thinking abilities. For four programs, standardized tests were the only category of measurement. Thirteen of the twenty-nine programs used more than one standardized test. Twelve of the 44 tests were administered upon entry and exit to the college/university or the nursing major, yielding a gain or change score. Twenty-six of the tests were administered at the end of the major, two were administered after graduation (NCLEX-RN licensure examination), and four were the NCLEX-RN summary from McGraw-Hill, placed in this category since it is a summary of a standardized test, though not an actual test per se. The frequency with which specific tests were used is shown in Table 2. Programs using the ACT COMP and Collegiate Assessment of Academic Proficiency tests indicated they did so as part of their institutional outcomes assessment plan.

Twenty-two programs used a locally developed instrument with seventeen of those instruments being a graduate/alumni and/or employer post-graduation survey. These surveys requested respondents to rate on a Likert-type scale the satisfaction with or the degree to which graduates were prepared to use critical thinking, problem solving, or decision making abilities. Five programs used other locally developed instruments that were designed to measure critical thinking abilities. They are as follows:
Table 2. Frequency of standardized test use

<table>
<thead>
<tr>
<th>Standardized test</th>
<th>N</th>
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</thead>
<tbody>
<tr>
<td>Watson-Glaser Critical Thinking Appraisal</td>
<td>9</td>
</tr>
<tr>
<td>NLN Diagnostic Readiness</td>
<td>6</td>
</tr>
<tr>
<td>NLN Comprehensive Achievement</td>
<td>6</td>
</tr>
<tr>
<td>California Critical Thinking Skills Test</td>
<td>4</td>
</tr>
<tr>
<td>Mosby Assess Test</td>
<td>3</td>
</tr>
<tr>
<td>NLN Clinical Nursing Assessment: Medical-Surgical I</td>
<td>3</td>
</tr>
<tr>
<td>NLN Achievement Tests (clinical topics)</td>
<td>2</td>
</tr>
<tr>
<td>California Critical Thinking Disposition Inventory</td>
<td>1</td>
</tr>
<tr>
<td>Cornell Critical Thinking Test</td>
<td>1</td>
</tr>
<tr>
<td>ACT COMP</td>
<td>1</td>
</tr>
<tr>
<td>Collegiate Assessment of Academic Proficiency</td>
<td>1</td>
</tr>
</tbody>
</table>

1. Faculty developed clinical judgment tool used at the end of each clinical course, and compared for change.
2. Faculty developed Nursing Critical Thinking Appraisal, multiple choice test administered at the end of the major.
3. Critical Thinking Survey, student self-report
Likert-type scale administered upon entry into and completion of nursing major.

4. Clinical case study administered upon entry into and completion of nursing major, compared for change/growth.

5. College-based outcome assessment, developed at the college/university and administered prior to graduation for all students at the institution.

Course specific measures were divided into 3 subcategories: written tests or examinations; clinical performance; and class or clinical written assignments. Thirty-nine programs utilized course specific measures to assess critical thinking. Seventeen of the programs used course specific measures in concert with other categories of measurement, 12 used this type of measure exclusively. Twelve programs used all three subcategories of measures, 19 used 2 of the 3 subcategories, and 8 programs used one subcategory of measurement, all of which were class and clinical written assignments. Viewed from another perspective, 38 of the 55 programs used the subcategory of class and clinical written assignments, 24 programs used course tests and examinations, and 20 programs used clinical performance measures, 5 of which were observed clinical performance and 15 of which were case study presentations or clinical conference discussions.

Written nursing care plans or case studies were the most
frequently used written assignments. Other examples of written assignments were journals or logs, process papers or recordings, management/change papers, teaching projects, small group projects, critique of research literature, and research projects. The timing of the evaluative measures occurred within the courses in the nursing major. Information about the types of items on course tests or examinations was not included in the data sets. Also, in the majority of cases, it was not possible to distinguish whether written class or clinical assignments were quantitative or qualitative measures.

Sixteen programs used from one to four capstone projects to evaluate students' critical thinking abilities. Two programs used this category as the sole type of measure. In all cases, the projects were completed during the last one or two semesters of the major, and were not specific to any one course in the nursing major. The 16 programs used twenty-five capstone projects in their evaluation of critical thinking. The topics and frequency of their use were: research, 7; management/leadership, 5; community, 4; complex topic or issue, 3; and one each of portfolio of paired projects, problem-solving, decision-making, values clarification, interactive video clinical simulation, and a manuscript to submit for publication.

The rationale cited for the selection of the evaluation
methods or processes was universal. All programs indicated that they selected their methods and processes of evaluation due to the relationship between the activities being evaluated and the expectations of the professional nurse in practice. Though not all programs explained this relationship by enumerating the specific professional nursing activities to which they referred, the majority did. The most frequently cited activities were: nursing process, 33; research, 24; problem-solving, 18; decision-making, 16; and clinical judgments/decisions, 9. Other activities cited 6 or fewer times were: management, ethical decisions, thinking/reasoning skills, analysis and synthesis, and affective components, such as values clarification and creativity.

All programs indicated that the results of evaluation activities would/have been reviewed to determine if courses, teaching strategies, or student learning experiences needed revision to improve students' critical thinking abilities. Not all programs specified the method by which changes would be made. Those that did indicate specific methods referred to the systematic evaluation plan for the program, review by the faculty as a whole, specific faculty committees, or teaching faculty within a given course.

Discussion

Programs evidenced the assessment of the cognitive
abilities of critical thinking in concert with academic achievement in many of the evaluation methods and processes. All course specific measures were in concert with academic achievement, as were the NLN-generated and Mosby AssessTest in the standardized tests category. The 18 locally developed instruments which included graduate, alumni, and/or employer surveys and the college-wide tool for all students may have a strong or no relationship with academic achievement, it was not possible to determine any relationship from the data provided. The other 4 faculty developed instruments were related to nursing, and therefore could be assumed to be assessments made in concert with academic achievement.

While forty-three programs included affective qualities in their definition of critical thinking, some of these programs used measures generally viewed as primarily cognitive in nature. Most of the definitions were global in scope, with one program also providing an operational definition of critical thinking. Some of the programs included program/curriculum or course objectives to "operationalize" critical thinking, though in some cases, critical thinking was not directly mentioned, but inferred from objectives related to problem solving, decision making or use of the nursing process. It was not clear if these activities were seen as synonymous with critical thinking or if they were viewed as a foundation for critical thinking. Use of the nursing process,
problem solving, and decision making were identified more frequently than clinical judgments when describing activities in nursing practice that required critical thinking, and therefore provided the rationale for their selection as evaluation activities. However, it is possible that some programs would assume inclusion of clinical judgments under nursing process activities without using the term clinical judgments. It was not possible to determine the existence of this assumption in the data provided by the self-study report pages.

The designation of written clinical assignments as evaluation measures for critical thinking was made more frequently than the observation of actual clinical performance. This may be due to the difficulty of a more precise meaning for the performance of clinical judgments in actual clinical or practice situations, or the assumption that a written nursing care plan can adequately provide evidence of clinical judgments.

Limitations

The sample size of 55 programs and the use of a relatively new criterion where little or no history exists prevent generalization from this study. Also, with one primary investigator, the possibility of bias exists.

There is no well-established framework for the evaluation
of a construct such as critical thinking. The framework used in the content analysis methods employed in this study was created for this investigation, and therefore has been used by no one else, or in any other context.

The amount of information in the self-study report sections on critical thinking varied among programs, as did the specificity of the information. This is a limitation of information presented in narrative form. Therefore, more detailed data that exceeded the required content was available from some programs, but not from others.

As programs described their evaluation methods and processes, some programs made very clear distinctions between teaching strategies designed to promote critical thinking or formative evaluation activities versus summative evaluation, or those methods designated as measuring/assessing the outcome of critical thinking. Some of the data could have been open to misinterpretation as the investigator made decisions about distinctions among the various activities described.

Implications

Critical thinking as an outcome in nursing education is currently being evaluated using a variety of methods and processes. This is due to the individual differences among programs, different conceptions of critical thinking and how it is evidenced in nursing practice, the relative "newness" of
evaluating critical thinking as an outcome measure, and the lack of a model for evaluation of a complex construct such as critical thinking. A model could provide needed direction for the evaluation of critical thinking, for teaching critical thinking, as well as the framework for research. Research is needed to answer many questions, such as, Is there is a relationship between critical thinking and clinical judgment? or nursing process? or problem solving? What level of critical thinking is appropriate in the undergraduate curriculum? What are the most effective ways of fostering students' critical thinking abilities? If it is valid to assume that nurses need critical thinking skills to take an active, leadership role in health care today, then nursing needs to begin to answer these, and many other, questions.

References


CHAPTER 4. CRITICAL THINKING: A MODEL

A paper to be submitted to the Journal of Nursing Education

Sheila L. Videbeck, RN, MS

Abstract

The emphasis on critical thinking in nursing has increased in response to the rapidly changing health care environment. This emphasis is underscored in nursing education by the National League for Nursing (NLN) accreditation process with the inclusion of a required outcome criterion related to the critical thinking abilities of baccalaureate nursing graduates. This article proposes a model and an accompanying process that can provide direction for nurse educators in the development and evaluation of nursing students' critical thinking abilities.

Introduction

Litwak, Linc and Bower (1985) define evaluation as the "continuing process of assessing individual knowledge, competencies, and behavior. Although it frequently involves a series of measurements, evaluation always rests on professional judgment based on sets of predetermined criteria" (p. 3). The concept of evaluating students' knowledge, skills, and abilities is not new in nursing education. Most
of the evaluation, however, has been that of individual student achievement or examination of different aspects of the nursing program as part of an overall program evaluation plan. The accreditation criteria, and therefore the systematic evaluation plan, included sections on structure and governance, material resources, policies, faculty, and the curriculum (NLN, 1983).

In 1989, the Council for Baccalaureate and Higher Degree Programs in Nursing approved changes in the criteria for accreditation. Included in the revision were five required outcome criteria: critical thinking, communication, therapeutic nursing interventions, graduation rates, and patterns of employment (NLN, 1992). The first three of the five criteria require nursing programs to use student achievement data for program evaluation purposes. Programs must evaluate the critical thinking abilities of individual students and use that outcome data in the development, maintenance, and revision of programs. Recognition of the dual purpose of the NLN outcome criteria requires a modified approach to evaluation that is different from the traditional single-purpose approach to either student achievement or program evaluation. Though certainly related to one another, student achievement and program evaluation have been viewed as distinctly different and separate, both in terms of process and product.
The Model

The model for evaluating critical thinking that is proposed was developed using the curriculum development process described by Torres and Stanton (1982), principles of program evaluation (Litwak, Linc, & Bower, 1985), and the use of the critical thinking process as conceived by Brookfield (1987) and Paul (1993).

Torres and Stanton (1982) describe the process of curriculum development beginning with discussion of philosophy, definition of terms, and a description of the characteristics of the graduate. Then curriculum objectives, course objectives, and specific content are identified. The entire curriculum is examined, though the emphasis is placed on courses in the nursing major. During the next phase of curriculum design, the philosophy is translated into action. An overall plan for implementation, including testing and teaching strategies, is developed. A significant component at this point is the examination for congruence from the philosophy to the teaching and testing methods and processes. Finally, judgments are made about the degree to which the graduates have attained the characteristics described in the initial phase of curriculum design.

The process of curriculum development is not unfamiliar to faculty in nursing programs. Often curriculum development centers around nursing content, i.e., theory and clinical
practice settings, roles of the professional nurse, an identified nursing model or theorist, or an integrated approach to the nursing curriculum. The construct of critical thinking is not a set body of knowledge, but is a process or way of thinking about theory, practice, roles, and so forth. Brookfield (1987) writes that "critical thinking is a process not an outcome" (p. 6). While that is true about critical thinking, per se, it is the challenge for nurse educators to describe the outcome or product of the critical thinking process in order to teach it and evaluate its use relevant to nursing practice.

The proposed model has several advantages for nurse educators. First, it provides a format for development and implementation that is based on a familiar format, that of curriculum development. The model also demonstrates the relationship among the necessary components of critical thinking and its infusion throughout the curriculum which should be particularly useful in striving for congruence among the definition, expectations of the graduate, methods of evaluation, and so forth. The components of the model organize the critical thinking process and identify the decision points that occur during the process. Lastly, the model acknowledges the similarities and overlap between the evaluation of individual student achievement and program evaluation, while making the necessary distinction between
those two evaluation targets. The author believes this last advantage addresses a primary source of difficulty for nursing programs with respect to the NLN critical thinking outcome criterion (Videbeck, 1995).

Using the Model

The process for implementation or use of the model includes questions to be addressed by faculty and assumptions that need to be examined based in part from relevant literature and research on critical thinking. The emphasis is placed on how to think about critical thinking, and less on what to think about it. In essence, it is the application of critical thinking processes to be used by nurse educators when addressing the construct and its application in nursing education. Hence the first assumption for examination: All nurse educators have the ability to think critically, and do so equally well. Hartley and Aukamp (1994) found that nurse educators had a significantly higher level of critical thinking ability than did nursing students, but Saarmann, Freitas, Rapps, and Riegel (1992) found that the critical thinking ability of faculty was not significantly higher than that of nursing students when the influence of age was controlled statistically.

The initial phase of the development process for critical thinking includes describing critical thinking in a global
sense, followed by operationalizing and contextualizing the global definition. The solid lines in Figure 1 represent the essentially unidirectional steps in this initial phase of development, and the dotted lines indicate feedback loops to be used during curriculum development discussions as questions are answered and assumptions are examined.

Figure 1. Initial phase of development

Whether the global definition is adopted or adapted from a recognized author, or constructed from a variety of sources, it is essential to have a definition that is used consistently throughout the process. Specifically, if both cognitive abilities and affective qualities are included in the conception of critical thinking, then both domains must be addressed when identifying expectations of graduates,
curriculum and course objectives, teaching and development activities, as well as stated outcomes and measurement of those outcomes. It can be tempting to include attributes such as a spirit of inquiry, fair and open-mindedness, or intellectual curiosity simply because they fit the ideal of critical thinking, and educators would like their graduates to possess those qualities. However, if these qualities are included in global and/or operational definitions, then they must be taught and evaluated. To identify only cognitive abilities in the definition of critical thinking for a particular program does not necessarily mean that affective qualities are less valuable or desirable. It may only mean that they are not included in critical thinking as an outcome measure for the graduate and program.

Questions for nurse educators at this point include:

What does the program mean by critical thinking?

How is critical thinking operationalized?

What behaviors indicate use of critical thinking abilities?

What affective qualities should graduates possess? Can it (they) be described in behavioral terms? Can it (they) be measured?

Can faculty agree on the operational definition(s), at least to the point that students get a clear and consistent message?
Another important aspect during the initial phase involves contextualizing the operational definition(s) of critical thinking. Nurse educators often view problem solving, decision making, and use of the nursing process as evidence of critical thinking in a global way with little discrimination among those activities (Jones & Brown, 1991; Tanner, 1993; Videbeck, 1995). Kramer (1981) suggests that providing care, simple teaching, and use of predictable interventions for patients with common and recurring problems can be carried out by persons with technical background and preparation. These activities may not necessitate use of critical thinking abilities. Some nurse educators surveyed (Videbeck, 1995) indicated that whether or not activities such as problem solving or use of the nursing process required critical thinking would depend on the situation or context surrounding the activity. Contextualizing critical thinking can be guided by the following questions:

What factors distinguish common, recurring situations from those that are nonroutine?

What variables, such as culture or personal beliefs, will alter the decision or judgment than might otherwise be indicated?

What factors make a situation, or the care of a client, complex in nature?

What assumptions might interfere with viewing a situation
from multiple perspectives?

Assumptions related to, and possibly interfering with, contextualizing critical thinking are:

The most complex situations involve the sickest patients, or those in certain clinical areas, i.e., intensive care units.

All nursing activities require critical thinking. Nursing activities that do not require critical thinking are not important, and therefore, should not be the responsibility of the professional nurse.

Evidence of critical thinking in nursing practice includes some of the decisions regarding context, particularly with respect to clinical judgments in the care of patients with complex problems. It also necessarily includes discussion of nursing practice activities in a variety of roles. Activities related to conducting research, supervising and counseling staff, and making complicated budgetary decisions may well be considered by nurse educators when identifying evidence of critical thinking in nursing practice. Doubtless, some activities of this nature will be described as requiring critical thinking abilities. Once nursing practice activities are identified, it is important to consider the level of advanced education and/or experience needed to fulfill these types of responsibilities. In other words, they undoubtedly require critical thinking abilities, but is it
reasonable to expect that newly graduated nurses with an undergraduate degree and little experience could or should occupy roles commensurate with these responsibilities? This leads to a series of questions appropriate to this phase of the critical thinking planning process:

- What expectations are reasonable for the graduate upon completion of the undergraduate nursing curriculum?
- What responsibilities require advanced education and/or experience?
- What foundations for advanced roles and responsibilities are necessary in the undergraduate curriculum?
- What does providing foundation knowledge and/or abilities mean?

Accompanying assumptions to examine during this phase of decision making are:

- Students benefit from at least a brief introduction to the activities of all roles and responsibilities that are possible in professional nursing.
- The undergraduate curriculum can (or should) prepare the graduate for all future practice.

Once the expectations for baccalaureate graduates have been determined, they form the basis for both curriculum objectives and operationalized outcomes related to critical thinking. It is important to describe critical thinking abilities at this level of the curriculum since these
abilities develop over time and require attention to their development throughout the nursing major. Short term efforts or occasional assignments and exercises will produce few and disappointing results.

Figure 2. Identification of outcomes

This is one of the points in development where checking for congruence is crucial. If the definition of critical thinking and the expectations for graduates are based heavily on making clinical judgments, then the stated outcomes need to reflect that emphasis. If critical thinking abilities have been contextualized to require consideration of complex patient care needs or differing cultures or personal values, the outcomes need to be stated in terms of those same contexts.

An essential component of the dual function of the model,
namely individual student achievement and program evaluation, is directly addressed in the designation of critical thinking outcomes. Litwak, Linc, and Bower (1985) distinguish between mandatory and desirable criteria. Mandatory criteria are those students must meet to continue in the program, while desirable criteria refers to all the material that faculty would like students to master. In the same way, a program outcome in critical thinking should be stated in terms of what it can be reasonable to expect from all graduates of the nursing program. A baseline expectation is established, and data for program evaluation purposes are reported in terms of those graduates meeting, exceeding, or failing to meet the outcome, in aggregate form. Over time, if data showed that too many graduates clustered in the "fails to meet" or "exceeds" category, program revision could be indicated. One of the possible problems is that the outcome may be too minimal or too stringent. The identification of desired outcomes for individual student achievement can represent the broader range of abilities that exist among students, so that all students can be challenged to develop to their fullest potential. Pertinent questions that might be helpful are:

What are the cognitive skills and/or affective qualities that represent the minimum achievement to be expected from graduates?

What are the full range of abilities and qualities that
faculty would like to see graduates possess?

Are the outcomes for critical thinking integrated with other nursing practice outcomes rather than isolated or separate outcomes?

The identification of course objectives relevant to critical thinking may actually involve revision of existing objectives or construction of new ones. This is particularly true if the conception of critical thinking contains or is built upon activities such as problem solving or decision making. Selecting or grouping existing course objectives related to other processes will not necessarily result in critical thinking objectives or abilities. Course objectives need to identify the components and/or behavioral evidence of critical thinking in order to maintain congruence within the construct of critical thinking, and to provide needed direction to faculty and students in both classroom and clinical settings.

It is also necessary to identify a hierarchical order for the concepts and behaviors of critical thinking that have been identified by the faculty (Workman & Allcorn, 1985). The principle of building from simple to complex knowledge and skills applies to critical thinking as it does to many concepts in nursing as well as other fields. For example, it would seem logical to determine whether students could distinguish significant or relevant data before proceeding to
making any kind of clinical judgment based on that relevant data. Likewise, students must accurately and clearly define an issue before being able to take a defensible position on that issue. Too often, clinical judgment or the elements of defending one's position on an issue are introduced in their entirety with too little consideration of the progression of the knowledge and skills involved. Questions at this stage of the model include:

How can the knowledge, skills, and abilities involved in critical thinking be arranged in a hierarchical manner?

How will the sequence of nursing courses (and relevant course objectives) use this hierarchical progression?

What kind of collaboration among faculty in different courses will be needed to maximize student learning/achievement?

Relevant assumptions to examine are:

After students learn the foundations of critical thinking, they will begin to use those abilities when an appropriate situation occurs.

If the theoretical components of critical thinking are presented in the first nursing course, then students apply those abilities in subsequent courses.

The next phase of the model involves the selection of
teaching strategies, learning experiences (both classroom and clinical), and formative evaluation processes. There are many references in the higher education and nursing literature that describe teaching/learning strategies designed to promote critical thinking. Two themes are apparent in most of these references: increased use of varied classroom strategies; and use of collaborative teaching techniques, that is, collaboration among students.

![Diagram](image)

Figure 3. Planning for teaching/learning

The lecture continues to be the most frequent format for the classroom, despite numerous articles and recommendations to the contrary. The lecture, no matter how pertinent, relevant, or well-delivered, will not foster critical thinking abilities of students. Nursing, as well as other disciplines, laments that there is so much content that has to be covered, there is simply no other method as efficient as the classroom
lecture, there is not enough time to incorporate other activities. It is true that alternatives to the lecture take more "teacher-time" to prepare, are less predictable in terms of the "content" that is covered, and need student participation to provide the most benefit to the learner. But if nurse educators do not begin to use some of the alternative, more interactive classroom activities, students' opportunities to think critically will continue to be limited. Lectures need not be totally abandoned, for a good lecture is a suitable format for certain types of material, and is certainly efficient (Brookfield, 1990). But the lecture does not provide practice in using critical thinking skills.

The other theme that emerges in the literature regarding learning activities is a need to use collaborative or group learning situations more effectively. Looking back at the ways in which critical thinking is evidenced in nursing practice, it could be said that few of these activities take place in isolation. Collaboration among colleagues within nursing as well as with members of other disciplines is frequently a desired goal in nursing practice, and therefore, nursing education. Nurse educators emphasize the need for collaboration and have course and/or curriculum objectives that relate to the collaborative role or function. However, most of the "instruction" and evaluation of students is done on an individual basis, involving teacher and student. For
students to value collaboration and become skilled in working collaboratively with others, they must have significantly more experience doing so in the educational setting. If a professional nurse had a very complex patient care situation, or a complicated problem to solve, wouldn't it be an expectation that the nurse would seek assistance from colleagues? It is doubtful that it would be wise or practical for the nurse to struggle with the situation all alone. Again, if collaboration is an expectation in practice, the educational experience should provide opportunities to develop needed abilities in similar circumstances.

Formative evaluation strategies are included with teaching strategies and are distinct from summative evaluation. Litwak, Linc, and Bower (1985) define formative evaluation as data gathering throughout the educational process. Data from formative evaluation may be used to modify teaching strategies while a course is in progress (Brookfield, 1990) without disrupting the entire course. Formative evaluation is also essential to guide student learning in the form of constructive feedback. That feedback is most helpful to the student when it is related to standards of achievement (Paul, 1993), such as accuracy, depth, relevancy, clarity, and so forth. For example, if students are assigned to write a paper on a current issue in health care, typical guidelines for the assignment usually include length, format, and
essential components for the content, i.e., description of the issue, the student's position, and rationale for the position. A student may complete the assignment, including all the elements, yet produce a paper of questionable quality. However, if the essential components include standards, such as indepth description of the issue, a clearly stated position on the issue, and logical, defensible rationale, it is much easier to provide corrective feedback. The other advantage of using standards is providing the student with more information about what the assignment entails, or what kind of thinking is required.

Some of the relevant questions at this point are:

What learning experiences will lead to the desired student outcomes?
What sequence of learning experiences will foster development of critical thinking skills?
Since experiences in the clinical setting cannot be predicted, what teaching strategies can supplement clinical learning?
How closely do expectations of students mirror expectations in practice?

Assumptions to examine include:

It is essential to include all of the "content" of nursing, that is, students must have at least a brief exposure to all content.
Observational experiences are valuable if they expose students to clinical areas where actual experience is not possible.

Students readily transfer knowledge and skills from the classroom to the clinical setting.

Experiences that promote critical thinking abilities can be generalized from one setting or situation to another.

If students can solve problems, make decisions, or think critically on an individual basis, they will be able to do so in a group situation.

The last component of the model concerns summative evaluation.

Figure 4. Summative evaluation

In planning for the evaluation of students' critical thinking abilities, it is helpful to reexamine the expectations and outcomes. The selected methods for evaluation need to be closely related to the established outcomes. For example, if an outcome describes the student's ability to make a clinical
judgment about patient care in a complex situation, then the selected method needs to evaluate the student's ability to do so. A written standardized multiple-choice test would not provide the data needed to evaluate the outcome.

Data collected to evaluate individual student achievement may be similar to data collected for program evaluation purposes, or in some instances perhaps the same method will be used to generate data for both purposes. A primary difference will be the way in which the data are used to make the two different decisions that are required. Data for program evaluation purposes are reported in terms of the students/graduates' relationship to the established minimum achievement required, in aggregate form. Often this is reported as those meeting the standard(s), exceeding the standard(s), or failing to meet the standard(s).

The entire model is depicted in Figure 5. The solid lines down the center of the model represent the unidirectional progress of the curriculum development process. The dotted lines indicate feedback loops used during curriculum development. Finally, the broken lines depict the program evaluation process with the potential to evaluate and revise any or all of the components of critical thinking. As indicated, the process of examining the required outcome(s), curriculum objectives, philosophy, and so forth, from a program perspective, guides faculty in the curriculum
Definitions of Critical Thinking

Evidence of Critical Thinking

Expert . . . . . . . in Nursing Practice . . .
Activities

Foundations needed by Undergraduate

Expectations of Baccalaureate Graduate

Critical Thinking Outcomes

Desired Individual Student Achievement

Relevant Course Objectives

Teaching Strategies Learning Experiences

Formative Evaluation

Summative Evaluation

Results of Summative Evaluation for Individual Student Achievement

Results of Summative Evaluation for Program Evaluation

Figure 5. Model for critical thinking
evaluation and revision process.

Data related to individual student achievement have been used throughout the actual implementation of the "critical thinking curriculum" to guide and foster individual achievement as students progressed through the nursing major. From a summative evaluation perspective, the range of student achievement data can assist faculty in evaluating instructional processes, student expectations, and so forth as indicated by the broken lines in Figure 5. If for example, the majority of students "exceled" in their individual achievement of critical thinking abilities, faculty might want to examine whether or not individual expectations are too minimal, that is, students might be capable of achieving more than was expected in terms of critical thinking. Or perhaps the selected methods did not measure what was intended.

To date, there have been no tests or methods developed that "measure" or evaluate critical thinking in nursing. Faculty-developed assessment or measurement methods would probably best reflect the program's conception of critical thinking in nursing practice. Standardized paper-and-pencil tests are often chosen because reliability and validity have been established, sometimes including normative data specifically using registered nurse groups. Since these tests usually report data on abilities of inductive and deductive reasoning, identification of assumptions, and so forth in a
nunnursing context, the results might be useful to determine students' baseline abilities upon entering the major, if the tests are to be used at all.

Relevant questions for this phase of the model include:
Which measures can be selected to best evaluate students' critical thinking abilities?
Does the method of measure closely resemble the established outcome, that is, does the measure mirror the outcome in terms of content, conditions, and so forth?
Should the measures be directly related to a nursing course, or would a capstone project provide more accurate and useful data?

Examination of assumptions at this point will involve questioning some of the evaluation methods that have long been used in nursing education. If, in fact, nursing is attempting to produce graduates who are able to think critically in order to keep pace with the rapid rate of change in health care, then traditional evaluation processes must be seriously questioned. Though not inclusive, some assumptions that have been made are:

Performance in clinical practice, particularly clinical judgment skills, can be evaluated through written work submitted by the student, i.e., the written work reflects actual clinical performance (Tanner,
The written nursing care plan, often developed after the care of the patient has been given, is an effective teaching tool, and/or provide pertinent data for evaluating students' thinking skills.

Critical thinking skills were used to develop NANDA nursing diagnoses, therefore, use of these diagnoses requires critical thinking abilities.

The most accurate evaluation of critical thinking focuses on the solution to the problem or the decision that is made.

As with any model that includes feedback loops, coming to the end places one back at the beginning. The data from summative evaluation that describes the output of the model provide input as the ongoing cycle of planning, implementing, and evaluating continues.

Summary

The model for critical thinking has been presented in an effort to clarify and delineate the dual evaluation aspects of NLN Required Outcome Criterion 1: Critical Thinking. Since the model is based on the curriculum development process and program evaluation principles that are familiar to faculty, it can be incorporated into existing development and evaluation activities. Because the model identifies the similarities and
differences in the two types of evaluation, it is hoped that nurse educators will be assisted to address both individual student achievement and program evaluation with respect to critical thinking more clearly.

As with any newly proposed model, its true usefulness and its continued development will only occur as it is used by nurse educators. The sample of questions to ask and the assumptions to examine are not inclusive, but only a beginning. As with any critical thinking process, more and better questions are generated by those involved in its use.

References


Summary

This study was designed for three purposes: to describe critical thinking relevant to the discipline of nursing as viewed by nurse educator experts; to describe current practice regarding methods of measurement of critical thinking skills in baccalaureate nursing programs; and to present a model for evaluation of critical thinking skills in nursing education that incorporates recommendations from the current literature and prevailing practice in baccalaureate schools of nursing, and meets the required outcome criterion of the accrediting body, the National League for Nursing (NLN).

The assessment of educational outcomes has received national attention at all levels, beginning in the 1980s. In 1988, the policy requiring all institutions in higher education to develop and implement educational outcomes assessment plans was instituted by regional accreditation associations. In 1989, the Council of Baccalaureate and Higher Degree Programs in Nursing of the National League for Nursing, the specialized accrediting body for baccalaureate schools of nursing, designated required outcome criteria, one of which was critical thinking.

There is widespread agreement on the need for critical
thinking abilities in professional nursing, and nurse educators have become increasingly focused on the development of these abilities in nursing programs. However, there is not agreement on the issues of what constitutes critical thinking and whether or not programs of nursing education further the development of critical thinking.

A review of the literature explored critical thinking in general, and as related to nursing practice and education. Critical thinking and the related knowledge, skills, and abilities needed to be successful vary from being specific, primarily cognitive in nature, and limited in scope to the more broad descriptions encompassing both cognitive and affective domains, and having application to life areas outside a discipline or field of knowledge. The same variation is found in the critical thinking nursing literature, as well as differences about what constitutes evidence of critical thinking in nursing practice. The literature review of measurement and evaluation of critical thinking abilities found studies demonstrating inconsistent evidence regarding critical thinking abilities of nurses, nursing students, and the effect of nursing education on the development of those abilities. Finally, the specialized accreditation process for nursing education was reviewed with particular emphasis on the required outcome criterion related to critical thinking for baccalaureate schools of nursing.
The remainder of this dissertation was presented in the form of three articles suitable for publication in a professional journal in nursing, *Journal of Nursing Education*.

The first article described a survey of 122 nurse educators in 122 NLN accredited baccalaureate schools of nursing. The survey questionnaire asked for opinions about critical thinking in nursing and in nursing education, so areas of consensus among the nurse educators could provide a beginning framework for critical thinking as viewed by experts. Consensus was limited to the need for inclusion of both affective qualities and cognitive abilities in definitions of critical thinking, and the lack of discrimination among problem solving, decision making, or clinical judgment as examples of critical thinking.

The second article described the prevailing practice of 55 NLN accredited baccalaureate schools of nursing with respect to the required outcome criterion on critical thinking. These nursing programs experienced a site visit scheduled during the first two academic years the required outcome criterion on critical thinking was used in the accreditation process.

The third article proposed a model for evaluating critical thinking. The model was based on the curriculum development process, principles of program evaluation, and the critical thinking process. The model was proposed to address
the difficulty posed by outcome assessment criteria, the dual focus of evaluating both individual student achievement and program evaluation around the same construct, critical thinking.

Limitations

The limitations of this dissertation are as follows:

1. Data were analyzed only by the primary investigator, therefore, bias could exist.

2. The amount of information from the 55 schools and the 122 nurse educators varied considerably in amount and specificity which could have hampered the investigator’s ability to make accurate decisions using content analysis methods. That is, when less specific information was provided, the meaning of that information could have been misinterpreted or categorized in error.

3. The survey questionnaire was investigator-designed and used only in this study, so items may not be valid or reliable.

4. Of the 345 programs in the population eligible to designate a nurse educator to complete the survey questionnaire, only 122 (35%) responded after an initial invitation and one follow-up postcard reminder. A telephone follow-up to 25 (10%) of the programs that did not
participate, determined that the primary reason for not completing the questionnaire was because the questionnaire was too time consuming. The length of time needed to complete the questionnaire is, therefore, also a limitation.

5. The proposed model has not been used or tested, and therefore no estimation of its value can be made.

6. Since the construct of critical thinking is described, defined, and evaluated in various ways by scholars in higher education and nursing based on the differing beliefs, hypotheses, and assumptions of those scholars, the beliefs, hypotheses, and assumptions of the single investigator designing the model have influenced the model, and may not be valid.

Discussion

The primary value of this research is that it makes a contribution to a new area of student and program evaluation in nursing based on the assessment of educational outcomes in terms of student achievement. Though much has been written about outcomes assessment as well as the need for critical thinking in nursing, there is little history and a small body of knowledge related to the implementation of assessment programs, or the existence of empirical support for critical thinking in nursing.
The proposed model is an attempt to provide some shape and structure to the evaluation of critical thinking in nursing programs. If it provides a framework that is useful in this endeavor, nursing will begin to have some standardization in the way critical thinking is conceived, evidenced in nursing practice, and evaluated in students. A consistent basis for comparison of new ideas and methods would allow nursing to build what it seems to believe is a needed body of critical thinking knowledge, skills, and abilities. If the model is used and found to be lacking, it can be improved through those efforts. If it is found to be totally faulty, still at least, a beginning will have been made as others find the faults of this model.

Implications for Further Study

First, and foremost, the proposed model needs to be tested for its accuracy, clarity, relevance, depth and utility. Only through actual use will any contribution to nursing education or students be realized. Criticisms or revisions to this work would be welcomed.

Further study of critical thinking in nursing practice is also needed. Is critical thinking crucial to professional nurses? Have these abilities now called critical thinking always been part of nursing practice, but known by another
name or no "name" at all? Is critical thinking just the latest buzzword in the ivory tower of academe?

If the model or subsequent revisions, or even a better model emerges, and is found to be useful, perhaps other outcomes in nursing education could be approached in a similar manner. Also, since critical thinking is not confined to nursing, or higher education institutions, other educators might be intrigued by this model, and stimulated in similar endeavors in their fields.
REFERENCES


APPENDIX A. NLN REQUIRED OUTCOME CRITERION 1:

CRITICAL THINKING
This outcome reflects students' skills in reasoning, analysis, research, or decision making relevant to the discipline of nursing.

I. Documentation
   A. Give the nursing unit's definition of critical thinking appropriate to each program.
   B. Provide a rationale and assessment of the methods or processes used to evaluate or measure critical thinking.
   C. Report critical thinking outcome data and its use in the development, maintenance and revision of program/s.

II. Evidence for Program Evaluators
   A. Reports
   B. Committee minutes
   C. Measurement instruments

III. Definitions:
   A. Nursing unit
   B. Mission
   C. Outcomes

APPENDIX B. SURVEY QUESTIONNAIRE TO SAMPLED SCHOOLS IN
CHAPTER 2
SURVEY QUESTIONNAIRE: CRITICAL THINKING

Please respond to the following items by selecting or providing the answer that best describes your current thinking about critical thinking. The thoughts and ideas in your responses are your own and may differ from those of others in your nursing program. Please select or write the responses that best describe your current thoughts and/or plans on the topic, even if you believe they may change in the future.

1. List the essential skills/abilities/concepts involved in critical thinking from the perspective of an educator in a baccalaureate nursing program.

2. The definition of critical thinking for graduates of baccalaureate nursing programs should be:

3. Should critical thinking behaviors or skill development for baccalaureate nursing students involve cognitive abilities and/or affective behavior? Which one(s), and why?

4. How are critical thinking skills most often evidenced in nursing practice?

(OVER PLEASE)
5. Which of the following are examples of critical thinking, that is, they are synonymous with critical thinking? (Mark all that apply.)

___ decision making
___ problem solving
___ resolution of ethical dilemmas
___ use of the nursing process
___ clinical judgments
___ creative thinking
___ other (specify)

6. Which of the following should specifically identify critical thinking behavior and/or skills in baccalaureate nursing programs? (Mark all that apply.)

___ School or Program Philosophy
___ School or Program Goals
___ Curriculum Objectives
___ Course Descriptions
___ Course Objectives
___ other

7. When should critical thinking abilities of students and/or graduates be evaluated? (Mark all that apply.)

___ upon entry to the college or university
___ upon entry into the nursing major
___ at the end of a particular course or courses
___ periodically throughout the nursing major
___ upon completion of the nursing major
___ just prior to graduation
___ some time after graduation
___ undecided
___ other (specify)

8. In which of the following ways should baccalaureate nursing programs measure/evaluate the critical thinking abilities of students and/or graduates? (Mark all that apply.)

___ standardized test (specify)
___ locally developed instrument
___ written course tests or examinations
___ clinical performance tests or evaluations
___ written course assignments (other than tests)
___ undecided
___ other (specify)
APPENDIX C. INITIAL LETTER TO SAMPLED SCHOOLS IN

CHAPTER 2
Dear Nurse Colleague:

Baccalaureate schools of nursing are currently discussing and thinking about critical thinking, particularly in relation to the NLN Required Outcome 1: Critical Thinking. As part of the requirements for a doctoral degree at Iowa State University, I am conducting a study that will focus on the critical thinking abilities of baccalaureate nursing students. There are three planned phases of this research: (1) a survey of nurse educators in baccalaureate nursing programs with knowledge and interest in critical thinking; (2) a description of current practices and methodology concerning NLN Required Outcome Criterion 1: Critical Thinking; and (3) the development of a proposed model for evaluation of critical thinking.

As part of phase 1 of the study, I am interested in what nurse educators think about critical thinking. Your program was selected for this study from the published list of NLN accredited baccalaureate nursing programs, and because your future accreditation site visit will include use of this criterion. The purpose of phase 1 is only to describe current thoughts and ideas about critical thinking. No attempt will be made to evaluate the nursing programs or the individuals responding to the questionnaire.

I am requesting that the enclosed questionnaire be completed by the person in your program who could best respond to the questions regarding critical thinking. This may be a faculty member who teaches concepts related to critical thinking, or you may be the appropriate person to respond to this questionnaire which requires 20-30 minutes to complete. A stamped self-addressed envelope is provided for your convenience.

The identity of the individual respondents and the nursing programs participating in this study will be known only to me, and the information will only be used in aggregate form. The information provided will be valuable and your assistance will be greatly appreciated. The confidentiality of each respondent and program will be vigorously maintained. Participation in the study is voluntary. The returned questionnaire will be the consent to participate, and you may request that your data be withdrawn from the study at any time.
Please call me at 1-608-257-4861, extension 2238 if you have any questions, or need clarification on any of the items.

Sincerely,

Sheila L. Videbeck, MS, RN
4805 Holiday Drive
Madison, WI 53711
APPENDIX D. FOLLOW-UP POSTCARD TO SAMPLED SCHOOLS IN
CHAPTER 2
As part of a study I am conducting for my doctoral degree, I recently sent a questionnaire regarding critical thinking to your program to be completed by the person on your faculty best prepared to respond to questions about critical thinking. If you need another questionnaire, or do not wish to participate in the study, please call me at 1-608-257-4861 ext. 2238. If the questionnaire has been completed, I thank you for your participation. If it has not been completed, would a member of your faculty have the time to do so? Your assistance is greatly appreciated.

Sheila L. Videbeck, MS, RN
APPENDIX E. INITIAL LETTER TO SAMPLED SCHOOLS IN
CHAPTER 3
Dear Nurse Colleague:

The development of critical thinking skills is essential for professional nurses. Nurse educators are concerned with defining, teaching, and evaluating the critical thinking skills of nursing students. As part of the requirements for a doctoral degree at Iowa State University, I am conducting a study that will focus on the critical thinking abilities of baccalaureate nursing students. There are three planned phases of this research: (1) a survey of nurse educators in baccalaureate nursing programs with knowledge and interest in critical thinking; (2) a description of current practices and methodology concerning NLN Required Outcome Criterion 1: Critical Thinking; and (3) the development of a proposed model for evaluation of critical thinking.

As part of phase 2 of the study, I am interested in how baccalaureate schools of nursing define, teach, and evaluate critical thinking abilities. Your program was selected for this survey from the published list of NLN accredited baccalaureate nursing programs, and because you are nearing or have completed an accreditation site visit using the newly implemented outcome criteria. The purpose of phase 2 of my study is only to describe current practices and methods of assessing critical thinking. No attempt will be made to evaluate the quality of methods used to assess critical thinking.

I am specifically interested in the data related to NLN Required Outcome Criterion 1: Critical Thinking. I am requesting that you take a few minutes to duplicate a copy of the pages of your self-study report pertinent to Required Outcome Criterion 1, and return the duplicated materials in the enclosed stamped self-addressed envelope provided. The identity of the nursing programs participating in this study will be known only to me, and the information will only be used in aggregate form. The information you provide will be valuable and your assistance will be greatly appreciated. The confidentiality of each program will be vigorously maintained. Receipt of the pages from the self-study report will be the consent to participate, and you may request that your data be withdrawn from the study at any time.

Please call me at 1-608-257-4861, extension 2238 if you have any questions.

Sincerely,

Sheila L. Videbeck, MS, RN
APPENDIX F. FOLLOW-UP POSTCARD TO SAMPLED SCHOOLS IN CHAPTER 3
As part of a study I am conducting for my doctoral degree, I recently requested information from your program regarding NLN Required Outcome Criterion 1: Critical Thinking. If you used the new criteria, could you send me a copy of those pages from your self-study report, or notify me that your program's materials are not ready to share? If you used the old criteria, could you please notify me of that fact? If you have recently responded to my request, thank you for your participation. Your assistance is greatly appreciated.

Sheila L. Videbeck, MS, RN