NURSING FACULTY PERCEPTIONS ON TEACHING CRITICAL THINKING

by

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Abstract

The perceptions of nursing faculty teaching critical thinking (CT) affective attributes and cognitive skills are described in this quantitative, descriptive study. The study sample consisted of nurse educators from the National League of Nursing database. The purpose of the study was to gain nursing faculty perception of which teaching strategies they used to teach CT. The rationale for the study was to explore how nursing faculty teach nursing students CT affective attributes and cognitive skills to care for clients with complex and multiple health care situations and in a highly technological health care environment. Nursing faculty is obligated to create learning environments to promote CT. Questionnaires were sent to 50 deans and directors of nursing programs asking them to describe which teaching strategies they thought were effective for teaching CT. Follow-up phone interviews were conducted with 7 nursing faculty who agreed to be interviewed. The results indicate that nursing faculty use multiple teaching strategies to effectively teach CT. The results indicate that nursing faculty believe that CT is a developmental process throughout the curriculum. The findings are congruent with the literature review, which showed that multiple teaching strategies were needed for development of CT affective attributes and cognitive skills. The findings are congruent with the current thinking about the use of simulation and technology in developing CT.

Dedication

To my family, who supported me without waver throughout my educational process. I dedicate this work to my parents, who gave me the principle of hard work and provided an example of finishing the course of work and understanding the cost that must be paid to gain benefits.

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Last and very important, I want to thank all participants who responded to the survey and telephone interview.

Table of Contents

List of Tables

CHAPTER 1. INTRODUCTION

Introduction to the Problem

Nursing is considered a complex and challenging profession. Nursing practice involves health care management for multiple and complex patient problems. Health care management must be safe and competent for patients. Patients enter health care systems with multiple and complex health care problems that require analytical and nonlinear thinking (Abel & Freeze, 2006; Alfaro-LeFevre, 2004; Bambini, Washburn, & Perkins, 2009; Childs, 2006; Eisenhauer, Hurley, & Dolan, 2007; Fulbrook, 2003; Hawkins, Todd, & Manz, 2008; Jeffries, 2005; Schmidt & Stewart, 2009; Van Gelder, 2005). Nurses need critical thinking (CT) skills to move beyond knowledge of health care problems and application of standardized health care interventions. Best practices in instruction, utilized by nursing faculty early in the educational process, facilitate the development of CT. Educational paradigms advocate that nursing students develop CT affective attributes and cognitive skills that can be seamlessly transferred into work environments.

Historically, nursing faculty utilized the nursing process as a scientific method for managing health care problems (Alfaro-LeFevre, 2004; Comer, 2005; Fulbrook, 2003). However, the nursing process engaged nursing students in problem solving for specific problems but did not develop traits such as open-mindedness and inquisitiveness that challenged assumptions, generated alternatives, and stimulated the interest and eagerness to learn (Abel & Freeze, 2006; Alfaro-LeFevre; Eisenhauer et al., 2007; Kurfiss, 1988;

Parr & Sweeney, 2006; Staib, 2003). The development of CT affective attributes and cognitive skills did not take away from the nursing process; in fact, CT enhanced the nursing process. The integration of CT affective attributes and cognitive skills and the nursing process provided clarity of patient problems and administration of care for desired health outcomes.

Nursing students were introduced to complex health problems that presented with similar signs and symptoms such as cardiovascular and respiratory diseases. Confronting complex health care problems without CT affective attributes and cognitive skills necessary to analyze situations, clarify problems, and generate conclusions and alternatives, nursing students might not administer interventions that produced positive outcomes. Nursing students needed CT affective attributes and cognitive skills to select with accuracy evaluation criteria for intervention (Comer, 2005; Eisenhauer et al., 2007; Jeffries, 2005; Lunney, 2003; Parr & Sweeney, 2006). Nursing faculty created learning environments using teaching strategies effective for CT development that lead to careful analysis, synthesis, and application of safe and competent nursing care. The scientific method of the nursing process promoted problem solving for health problems whereas a higher level of thinking was necessary for complex health care problems (Alfaro-LeFevre, 2004; Burbach, Matkin, & Fritz, 2004; Harvard-Hinchberger, 2006; Van Gelder, 2005).

Current nursing paradigms required nurses to be proactive in their nursing practice. Nurses are to develop clinical judgments that allowed them to take action against potential as well as actual health care situations. Proactive thinking was of importance when the focus of health care outcomes was health promotion and disease

prevention. Current educational practices no longer rely on the nursing process as the only means of providing care. Multiple teaching strategies was utilized to teach and to evaluate development of CT affective attributes and cognitive skills that can be transferred into nursing practice (Brown, Kirkpatrick, Mangum, & Avery, 2008; Harvard-Hinchberger, 2006; Hawkins et al., 2008; Walsh & Seldomridge, 2006). Current research in nursing education is conducted using technology such as simulation, YouTube, podcasts, Webinars, blogs, and narrative pedagogies that enhance learning for nursing students and provide evidence-based practice for nursing faculty (Bambini et al., 2009; Bartlett et al., 2008; Brown et al., 2008; Galloway, 2009; Royse & Newton, 2007; Schmidt & Stewart, 2009).

The National League for Nursing Accrediting Commission (NLNAC) required the inclusion of CT instruction in curricula at all levels of nursing (Riddell, 2007; Staib, 2003; Walsh & Seldomridge, 2006). The NLNAC required documentation of the CT component in the curriculum during self-study reports (N. C. Facione & Facione, 1994; NLNAC, 2006). Regulatory agencies supported nursing programs that provided students with knowledge and skills necessary for health care management. Nursing faculty were ethically responsible for utilizing evidence-based teaching strategies to develop and strengthen CT in nursing education.

Nursing research was necessary to establish evidence-based practices for teaching strategies that develop CT in nursing students. Students entered nursing programs with different degrees of CT related to use in personal, social, political, and professional lives. The context in which individuals use CT is evident in one area of their lives at any time. CT may be well developed in personal issues but not in social or professional issues. The

maturity levels of students who enter nursing programs determine whether CT affective attributes and cognitive skills need development or enhancement (Brookfield, 1997; Elder & Paul, 1996; Mangena & Chabeli, 2005; Riddell, 2007).

Background of the Study

Nurse educators are expected to prepare nurses to meet the challenges of current and future health care problems. Current nursing education trends provided guidelines that emphasized CT affective attributes and cognitive skills necessary to meet the needs of a multicultural society (Childs, 2006; Fulbrook, 2003; Walsh & Seldomridge, 2006). Jeffries (2005) wrote that employers expected novice nurses to enter the work environment with the problem solving and CT skills necessary to care for culturally diverse health care populations. Rothgeb (2008) wrote that competent and safe nursing practice resulted from nursing educators creating learning environments where students were active participants and exhibited CT cognitive skills and affective attributes.

Nursing faculty needed awareness that students live in highly stimulating, fast-paced technological environments that included surfing the Internet, video and computer games, and MP3s and iPods. With consideration of the highly stimulated and fast-paced environments, nursing faculty needed to know how to integrate these technological tools into the learning environment. Nursing faculty required educational preparation to use technological tools.

Current nursing education trends mandated that nursing faculty understand how to educate students with technical skills as well as CT affective attributes and cognitive skills for nursing practice. Learning outcomes for CT development included management of health care problems using textbook learning, technology, cost containment, global

health care, and aging populations. Rapid changes in health care, technology, patient safety initiatives, and outcomes-based or evidence-based practices drive health care environments. To meet the current needs of health care delivery, curricula were changing from knowledge-based informational learning to higher levels of learning using diverse teaching strategies that promoted learner-centered education (Brown et al., 2008; Rothgeb, 2008). Methods of instruction needed to fit the learner-centered approach to education and practice.

Current nursing education trends emphasized the need for CT skills. The current nursing education mandate from the National League for Nursing (NLN; 2005) was for nursing faculty to perform research regarding teaching strategies that promoted the development of CT for nursing students. The NLN has supported literature that educating nursing students can no longer be status quo and that nursing faculty can no longer teach as they were taught. The technological atmosphere for current nursing students has necessitated that nursing faculty seek teaching styles that engaged student learning to fulfill the needs of the current health care population.

Nurse educators provided large amounts of knowledge that educated nursing students about relevancy, significance, and application of the knowledge, and that CT was an important element of the knowledge (Kurfiss, 1988; Riddell, 2007; Staib, 2003; Tsui, 2002; Van Gelder, 2005; Walsh & Seldomridge, 2006). The NLN provided core competencies for nurse educators that facilitated learning. Core competency 1 stated the role of nurse educators in facilitating learners' development of CT and critical reflection. The first bulleted task statement of core competency 1 referred to using various teaching strategies to effectively facilitate learning; and the second bulleted task statement stated

that teaching strategies should be "grounded in educational theory and evidence-based teaching strategies" (2005, p. 1).Core competencies were guidelines for nurse educators to perform responsibly in the teaching and learning process.

A literature search in EBSCOhost and ProQuest databases used search words such as *nursing* and *CT, nursing and teaching methods or strategies, nursing faculty and CT,* and *nursing faculty* revealed greater than 3,000 hits. Many of the hits were redundant in the search queries. Search queries *for nursing and CT* or *nursing and teaching methods or strategies* involved research studies with nursing students and CT outcomes for specific teaching strategies (Brown et al., 2008; Childs, 2006; Cleary-Holdforth, 2009; Ellermann, Kataoka-Yahiro, & Wong, 2006; Martin, 2002; Parr & Sweeney, 2006; Tsui, 2002; Rothgeb, 2008). Other research studies performed with nursing students and CT outcomes recommended formal preparation of nursing faculty for educating students in CT (Brown et al.; Ellermann et al.; Parr & Sweeney; Schaefer & Zygmont, 2003; Twibell, Ryan, & Hermiz, 2005). The literature search revealed the most notable teaching strategies were concept mapping, human patient simulation, case scenarios, and case studies (Abel & Freeze, 2006; Brown et al.; Childs; Jefferies, 2005; Klegaldie & White, 2006; Rothgeb; Staib, 2003; Tsui). Discussion and recommendations from these studies revealed that faculty should be aware of their educational philosophy and teaching of CT. Nursing faculty who understood the concept and definition of CT were able to transfer that knowledge to nursing students. Nursing faculty role-modeled CT cognitive skills and affective attributes in ways that nursing students understood CT in nursing education and practice.

The literature review revealed that most nursing faculty were educated in teacher-centered environments (Riddell, 2007; Schaefer & Zygmont, 2003; Zygmont & Schaefer, 2006). Nursing faculty educated in teacher-centered environments now deal with situations that occurred as a result of transferring into student-centered environments. The literature review revealed barriers that interfered with nursing faculty educating nursing students in student-centered environments (Atherton, 2004; Cleary-Holdforth, 2009; Elder & Paul, 1996; Hawkins et al., 2008; Mangena & Chabeli, 2005; S. J. Smith & Roehrs, 2009; Walsh & Seldomridge, 2006). Barriers were inadequate formal education for teaching CT, feelings and thoughts of loss of control in the classroom, failure to engage students in taking ownership of their learning, and assurance that CT affective attributes and cognitive skills were embedded within the curricula. Barriers were mandates from institutional administrations to teach content and to move students forward in coursework that enabled timely graduation rates.

Statement of the Problem

The complexity of patient care problems along with multicultural populations of nursing students and patients necessitated CT development. Nursing students needed to understand what is happening in patient care situations to implement effective health care. A review of relevant nursing education literature provided evidence that nursing students needed CT affective attributes and cognitive skills to recognize complex health problems and effective health care managers (Clemons, 2006; Forneris & Peden-McAlpine, 2007; Mangena & Chabeli, 2005; Tsui, 2002). Critical thinking was considered a higher level of thinking evident by excellent clinical judgments (Alfaro-LeFevre, 2004; Atherton, 2004; Brookfield, 1997; Brookfield & Preskill, 2005; Elder &

Paul, 1996; Turner, 2005; Weber, 2005). Critical thinking was considered creative, flexible, reflective, and essential for nursing practice.

Purpose of the Study

The purpose of the study was to identify which teaching strategies nursing faculty used to teach CT and facilitate the transference of CT affective attributes and cognitive skills into clinical practice. The study purpose was for nursing faculty to identify which outcomes were most important in their teaching for CT development. The study aimed to identify whether there were relationships when teaching CT relative to educational level, years of nursing experience, years of teaching nursing, level of nursing programs, and courses teaching or taught.

A literature review of nursing research revealed that teaching strategies affected the development of CT affective attributes and cognitive skills. Teaching strategies that influenced CT development were human patient simulation, group discussion, reflection, journaling, role playing, case study, concept mapping, lecture, games, and discussion (Alfaro-LeFevre, 2004; Brookfield, 1997; Bucy, 2006; Clemons, 2006; Forneris & Peden-McAlpine, 2007; Fulbrook; 2003; Harvard-Hinchberger, 2006; Kurfiss, 1988; Van Gelder, 2005). The intent of the study allowed nursing faculty to explore and review their perceptions of teaching strategies that were effective for CT development and how CT was incorporated into their curricula.

Rationale

The study was conducted to identify the teaching strategies nursing faculty used for CT development in nursing students and to facilitate the transference of CT into

nursing practice. Teaching strategies are tools, but the perception and thinking of nurse educators about using these tools for CT are important. The study sought to identify whether there were relationships across the levels of education and teaching CT and whether different teaching methods were needed at individual nursing programs. The study results added to research about teaching strategies and the evidence-based practices for teaching CT.

Research Questions

The following research questions guided the study:

1. What instructional strategies do nursing faculty report that they use to develop CT skills in their nursing students?

2. What do nursing faculty perceive were the most important CT affective attributes and cognitive skills that contribute to effective nursing practice?

3. What do nursing faculty perceive were the most important outcomes of teaching CT to nursing students?

4. What relationship exists among educational levels, teaching experience, teaching levels, and courses taught among nurse educators for teaching CT development in nursing students?

Significance of the Study

Nursing research revealed effectiveness of teaching strategies to develop CT in undergraduate and graduate nursing students. Fewer studies were conducted with associate degree nursing students as participants. The research study incorporated all types of nursing programs to broaden research on the effectiveness of teaching strategies as evidence-based practices for CT development at all levels of nursing education.

The significance of the study described how nursing faculty perceived the effectiveness of teaching strategies for CT development in nursing students. The study sought to evaluate what significance nursing faculty placed on using teaching strategies for CT development. The importance of the study was the addition of findings to existing nursing research on effective teaching strategies for CT development in nursing students.

The significance for nursing faculty was to identify which CT affective attributes and cognitive skills in nursing students resulted from their use of teaching strategies in classrooms and clinical experiences. The study permitted nursing faculty to explore how they effectively used teaching strategies to achieve learning outcomes among their students. The significance of the study was for nursing faculty to be aware of nursing research on teaching strategies and CT development. A literature review of nursing research helped nursing faculty to explore and to clarify their thoughts and feelings about professional accountability and responsibility in educating nursing students.

Definition of Terms

Critical thinking (CT) is the reflection on a situation that requires a solution but one in which not all information is present to make the solution feasible; however, through data collection, information seeking, and reflection on multiple perspectives of the situation, a solution is created and individuals provide rationales for the solution. CT is an active cognitive process that goes beyond informal thinking and acquisition of knowledge and required a step-by-step procedure of analysis, synthesis, and evaluation with dedication, effort, time, and practice (Alfaro-LeFevre, 2004; Brookfield, 1997; Elder & Paul, 1996; Kurfiss, 1988; Riddell, 2007; Scheffer & Rubenfeld, 2000; Van Gelder, 2005; Walsh & Seldomridge, 2006).

CT affective attributes and cognitive skills enhance nursing students' ability to accomplish the learning objectives of the program curriculum and enables clinical judgment in nursing practice (Alfaro-LeFevre, 2004; Scheffer & Rubenfeld, 2000; Walsh & Seldomridge, 2006).

Nursing faculty refers to individuals with a master's or doctorate in nursing education or education or advanced practice teaching at any level of nursing. Individuals have licensure and/or advanced certification to practice in their home state or compact state (NLNAC, 2006). The term *nurse educator* is used interchangeably with nursing faculty.

Nursing student is an individual who has entered a 2-year, 4-year, graduate or doctoral nursing program to gain knowledge and skills consistent with professional nursing educational outcomes that result in successful completion of the licensure exam for the registered nurse and/or the decision to proceed to advanced practice nursing education and ultimately certification. The term *nursing student* includes all levels of nursing.

Teaching strategy is an instructional method used by nursing faculty based on their perception that it effectively develops the learning outcome of CT in nursing students (Brookfield, 1997; Comer, 2005; Elder & Paul, 1996; Jeffries, 2005; Kurfiss, 1988; Parr & Sweeney, 2006; Riddell, 2007; Staib, 2003; Van Gelder, 2005; Walsh & Seldomridge, 2006). The terms *instructional strategies, best practices of instruction,* and *teaching strategies* are used interchangeably.

Assumptions and Limitations

Assumptions of the study were as follows:

1. CT was essential for nursing education and nursing practice.

2. Nursing faculty's educational philosophy guided their perception of which teaching strategies effectively developed CT.

3. CT enabled novice nurses to enter clinical practice with advanced ability to make decisions in patient care situations that promoted positive outcomes.

4. Nursing faculty's teaching strategies were related to the development of CT.

5. Nursing faculty created learning environments conducive to CT development.

Limitations of the study were as follows:

1. Data collection was from a convenience sample taken from the National League of Nursing, which is a national organization of nurse educators. This was a convenience sample; therefore, the sample was not representative of the universe of faculty at nonmember institutions (Gall, Gall, & Borg, 2003).

2. A cross-sectional survey design was used; the data collection was from one point in time. The cross-sectional design produced data about nurse educators at a specific time in their teaching career. A cross-sectional design can be generalized to other population but is not as strong as longitudinal in showing the entire process as nurse educators develop their educational philosophy. Gall et al. (2003) found that a major limitation of cross-sectional design was the changes in attrition and attitude that occurred during the time of data collection and that generalization was not made to the entire population.

3. A limitation of self-reporting on surveys was that participants might not be knowledgeable on the subject. Participants may chose not to answer questions because of not understanding a question or for other reasons (Gall et al., 2003).

Nature of the Study

The study used a mixed-method nonexperimental approach. The study was a survey research design with a telephone interview phase. Questionnaires were mailed to 50 deans and directors of nursing departments chosen from a list of nursing programs provided by NLN at a cost of $250. The study used a nonprobability convenience sample, which was selected based on convenience, ease of selection, and low cost. The first 10

pages were selected from the database. Five nursing programs were selected from each page. Geographical location was not a variable in the study.

A survey question asked whether participants wanted to have a telephone interview to further express their perception of teaching CT. Although the sample was not randomized, a systematic approach was used for selection. On the survey, all participants were invited to have a telephone interview. The selection of the participants was based on their acceptance of the invitation by checking the box on the survey.

Statistical Package for the Social Sciences (SPSS) version 16.0 was used for quantitative data analysis using descriptive statistics. Qualitative data were collected by note taking during the telephone interview and later compiled per participant.

Theoretical Framework

The assumptions of Knowles's principles of adult learning provided the framework for describing nursing students as self-directed adults who decided to enter nursing programs (Atherton, 2004; Elder & Paul, 1996; Mangena & Chabeli, 2005). Nursing students entered nursing programs for personal and professional development and social, economic, or political reasons. Personal reasons may be to establish careers that sustained themselves and their families. Professionally, nursing students assessed their career goals and entered nursing programs for career advancement.

The framework of Knowles's principles of adult learning was appropriate for nursing students (Knowles, 1984). Nursing students entered undergraduate and graduate nursing programs at different levels of maturity and with obligations such as jobs, families, and debts. Nursing students entered nursing programs from highly stimulated, technological environments. Nursing students entered nursing programs with their

educational goals and objectives intact seeking specific information to reach those goals and objectives.

Nursing students entered nursing programs with ideas of which learner characteristics were necessary to sustain and to complete the program. Nursing students understood the responsibility needed for learning. Nursing faculty who understood the principles of adult learning created learning environments with an understanding that nursing students (a) had individual characteristics, (b) entered nursing programs with credible life experiences to share and broaden learning, (c) required flexibility in learning because of differences in learning styles, and (d) had intrinsic motivation as the most likely reason for entering the nursing program (Knowles, 1984). Nursing students needed an awareness of their ability to critically think about nursing subject content and gain confidence in their ability to analyze, integrate, and evaluate subject content nursing practice (Mangena & Chabeli, 2005; Riddell, 2007; Zygmont & Schafer, 2006).

Malcolm S. Knowles originated the model of andragogy in the United States to emphasize the importance of adult life experiences in the learning environments (Holton, 2005). Knowles's model of andragogy moved to student-centered environments. The premise was that adult education curricula should meet learners' needs and interest. Subject matter that reflected adults' life experiences enabled students to find meaningful and enjoyable learning. Assumptions of andragogy reflected open and flexible learning environments with dialogue that enabled adults to feel free and safe to challenge traditional practices and to seek solutions beyond what is in textbooks.

Knowles's model of andragogy was based on the assumptions that life experiences are major components of adult development. The aim of the assumptions was

to raise the awareness of administrators and teachers of the difference between adult learners' and children's needs. Adult learners required teaching strategies consistent with their developmental stage. The assumptions were as follows:

1. Adults sought out learning experiences for personal and professional development as well as the pleasure of learning.

2. Adults were self-directed learners. Adults knew why they were in learning environments and expected instruction to satisfy the reasons. Adult learners were best in learning environments where they had some control over their learning and where the learning had meaning for their lives (Alfaro-LeFevre, 2004; Brookfield, 1997; Holton, 2005; Kurfiss, 1988).

3. Life experiences were significant and resulted in obtaining meaning from the subject matter. Adults brought a wealth of experiences into learning environments that might be different from or be unfamiliar to teachers. Real-life experiences were basis for learning and for complementing textbook data and teachers as subject matter experts.

4. Adults came into learning environments to seek answers for situations that developed in their lives. Adults desired to be self-directed learners who did not need teachers who gave their knowledge of the subject matter with the expectations that students would return it back to them in like manner. Adults preferred learning environments of give and take and active participation for acquiring knowledge and application of knowledge to practical situations.

5. Differences in age, learning styles, personalities, and lived experiences influenced adult learning. Nursing faculty created learning environments that optimize these differences.

6. Adults entered learning environments with intrinsic motivation greater than extrinsic motivation. Triggering events usually led them back to school, which originated from making decisions about their life situations.

Knowles's model of andragogy focused on adult education that supported learners in becoming knowledgeable about subject content and combined knowledge and life experiences in ways that produced meaningful learning outcomes. Adults who were accustomed to seeking solutions did not need teachers to teach solutions, but to facilitate, guide, or coach them in problem solving. Nursing faculty created and facilitated

collaborative learning environments for active participation and positive learning outcomes. Nursing faculty learned to relinquish control of the learning experience or shared learning with students. The ideal educators for adult learners were not afraid of challenges to their knowledge but enjoyed the dialogue and learning that resulted from collaborative learning.

Collaborative learning environments reflected adult learning principles that are learner-centered (Clemons, 2006; Driscoll, 2005; Holton, 2005; Van Gelder, 2005). Characteristics of collaborative learning environments were (a) laughter with the learning, (b) safe environments that encouraged students to take risks and build trust, (c) nonthreatening and nondiscriminatory, (d) encouragement of nonconformity, and (e) self-awareness of learning and facilitation of active participation. Adult learning environments that emphasized these characteristics produced outcomes such as fascination and eagerness in learning, self-esteem and self-concept, self-confidence in thinking and learning ability, and student satisfaction.

Students, as active participants, increased curiosity and understanding about the subject concepts, increased confidence to build concrete structures, and moved between concepts and structures (Bambini et al., 2009; Brown et al., 2008; Dreifuerst, 2009; Elder & Paul, 1996; Fountain & Alfred, 2009; Parr & Sweeney, 2006; Schmidt & Stewart, 2009; Squire, Giovanetto, Devane, & Durga, 2005; Van Gelder, 2005; Walsh & Seldomridge, 2006). Nursing faculty created safe learning environments conducive to active participation and building of CT (Childs, 2006; Elder & Paul; Mangena & Chabeli, 2005; Riddell, 2007; Staib, 2003; Tsui, 2002). Nursing faculty utilized teaching strategies that developed reflection, open-mindedness, creativity, inquisitiveness, and contextual

learning. Nursing students learned to challenge assumptions and generate alternatives that were critical elements of CT (Atherton, 2004; Bambini et al.; Brookfield, 1996; Clemons, 2006; Comer, 2005; P. A. Facione & Facione, 2007; Cato, Lasater, & Peeples, 2009; Riddell; Staib; Van Gelder).

Nursing faculty utilized Knowles's model to create learning environments for CT development in nursing students. Teaching strategies utilized in classrooms and clinical experiences promoted interactive learning for student achievement and for acquisition of CT affective attributes and cognitive skills. Students gained the ability to transfer their knowledge into work environments. Student achieved CT affective attributes and cognitive skills such as self-confidence, intellectual integrity, ownership of learning, excitement, and curiosity about learning (Bambini et al., 2009; Brookfield, 1997; Cato et al., 2009; Dreifuerst, 2009; P. A. Facione & Facione, 2007; Fountain & Alfred, 2009; Martin, 2002; Parr & Sweeney, 2006; Ridley, 2007; Schmidt & Stewart, 2009; Squire et al., 2005; Staib, 2003; Walsh & Seldomridge, 2006). The acquisition of CT skills worked well in the management of multiple and complex health problems.

Organization of the Remainder of the Study

Chapter 2 discusses theories of CT and learning focusing on definitions and descriptions of CT and critical thinkers and nursing research studies of teaching strategies that enhanced CT development. The literature review consisted of studies related to the effectiveness of teaching strategies on CT development. Chapter 3 discusses the research methodology for data collection and data analysis. Chapter 4 describes data collection and analysis of the study. Chapter 5 provides the discussion of the results, conclusions, and recommendations of the study.

CHAPTER 2. LITERATURE REVIEW

Nurses enter work environments in unique positions. The definition of nursing ascribes the position of working under the supervision of the physician; however, independent and autonomous thinking is necessary for providing quality patient care. Nurses are expected to provide advocacy and coordination of individual patient care. Nursing practice occurs within multidisciplinary environments where nurses are leaders in patient care management. Based on the extensive and comprehensive patient care requirements, nurses need knowledge and skills beyond textbook learning.

Patient care management occurs outside textbook learning and within health care environments. Nurses who are quick to think on their feet provide instantaneous resolution of some health problems. Nurses apply critical thinking (CT) affective attributes and cognitive skills such as creativity, intuitivism, reflection, and open-mindedness to support patients in disease prevention, health promotion, and health maintenance for positive outcomes. Positive outcomes occur for patients and for nurses. Patient outcomes are the ability to make autonomous and independent decisions about personal health care and to sustain health without complications. Nurses gain confidence and competency as they move through the care process and successfully manage patient health care problems.

Changing needs of health care delivery systems and health care problems make it compulsory for nursing education to move away from designing curricula with great

quantities of subject content. Technological and social changes necessitate that nursing education keep current with progressive strategies for teaching and learning. Rapid technological changes necessitate that resources for teachers and learners be initiated in higher education institutions to prepare students for working in variable work environments (Bambini et al., 2009; Clemons, 2006; Comer, 2005; Fountain & Alfred, 2009; Jeffries, 2005). Resource labs, such as simulation-based teaching, produced real-life health problems and enhanced nursing students' ability to critically think about solutions to specific health problems and to store information for application of knowledge when unfamiliar health problems were encountered. Teaching strategies implemented by nursing faculty cultivated problem solving and CT affective attributes and cognitive skills essential to current nursing practice and health care delivery systems.

Nursing education must be current with needs of health care delivery systems and health care problems. Nurse educators, faced with changes in health care practices, must critically reflect on personal feelings and thoughts about the need for teaching CT to prepare students for practice. The critical reflection process was awkward and uncomfortable and left individuals frustrated because the process called for self-honesty, in-depth self-inquiry, and thinking (MacDonald, 2002). Unlearning a trusted practice, a person was left with feelings of loss and confusion and searched to find if what was lost had any underlying truth (MacDonald). These feelings and thoughts began critical reflection and challenged personal, social, and cultural attitudes and assumptions (Alfaro-LeFevre, 2004; Riddell, 2007). This unlearning process was congruent with the nursing educators who were moving into student-centered learning environments. Alfaro-LeFevre wrote that nurse educators were unable to examine and to understand their attitudes and

assumptions about the teaching of CT and whether CT could be learned. Once nurse educators clarified their perceptions and definitions of CT, how they affected their teaching of CT, and how CT fitted the mission and philosophy of their curriculum, they initiated innovative teaching strategies that led to the development of CT affective attributes and cognitive skills, which were transferable into clinical practice (Forneris & Peden-McAlpine, 2007; Riddell, 2007; Zygmont & Schaefer, 2006).

Chapter 2 discusses CT as revealed in the literature review. Topics for the discussion are CT definitions and descriptors, faculty and student relationships to CT, and teaching strategies for CT development.

Critical Thinking Elements Definitions

The definitions of CT are multiple, but a basic understanding underlies each definition. CT is a process that starts within a contextual situation and moves affective and cognitive processes through a series of steps reaching an outcome. The basics of CT definitions are inclusive. The literature review revealed that there are critical components that fitted within each definition, whether definitions are discipline-specific or extend to all disciplines. Inclusive to each definition is that CT is a reflective process requiring analyzing, synthesizing, and evaluating problems and an understanding that there might be no right solution, but generating enough information to discover the appropriate solution for the problem. Inclusive in the reflective process are students challenging assumptions, generating alternatives, using deductive and inductive reasoning, and faculty as coaches, guides, or facilitators. These are the basic premises of the cognitive skills involved in definitions of CT.

Definitions of CT are based in the affective component. Inclusive in those definitions were characteristics of the faculty who created learning environments and of the students who entered learning environments. Basic affective attributes for faculty included confidence in teaching and modeling CT, enthusiasm, aspiration, and motivation to teach students. Self-regulation, perseverance, perception, reflection, passionate information seekers, and desire to learn characterized basic affective attributes for students. Basic cognitive and affective components of CT definitions have basis in nursing theories and in the nursing process.

CT definitions were thought to be the same across disciplines; yet, nursing researchers and educators were seeking to find a consensual definition of CT in nursing. A consensual definition was meant to take away confusion and misunderstandings about constructs of CT. Critical thinking definitions specific to nursing removed the possibility of nurse educators and researchers performing from their personal or professional understanding of CT. N. C. Facione and Facione (1994) wrote that a consensual definition from the Delphi study conducted in 1990 was appropriate for nursing programs. The consensual definition by 55 experts in arts and science read, "We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which judgment is based" (Facione and Facione, 1994 p. 2). This statement is a part of directives from the National League for Nursing Accrediting Commission (NLNAC) and American Association of Colleges of Nursing (AACN) that baccalaureate nursing

programs incorporate CT into curricula. The NLNAC directed that a CT component be incorporated in all levels of nursing from practical nursing to advanced practice nursing.

Specific Definitions of CT

Thinking is universal; it is used in context of actions and locations of individuals. Scriven and Paul's definition of CT was based in universal thought—that depending on individuals' situations, the thinking process might be biased, lethargic, purposeful, or manipulative. Scriven and Paul's (2004) definition relates to cognitive thinking:

> CT is that mode of thinking—about any subject, content, or problem—in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them. (para 1)

Usually, individuals do not understand how they think and the implications of their thinking in their lives. Often, there might be faulty thinking in one area that resulted in inaccurate decision making. To guarantee accurate thinking, reflective and CT must cross all facets of individuals' lives.

The definitions of CT used by nursing researchers and educators were based on the definition created by the N. C. Facione and Facione's Delphi study (1994). In nursing research and education, affective attributes and cognitive skills that resulted from studies were equivalent to the descriptors obtained from the Delphi study. Descriptors such as *habits of the mind* and *skills* used in nursing research were congruent with CT descriptors, affective attributes, and cognitive skills, found in literature on CT. The consensual definition by Scheffer and Rubenfeld's (2000) Delphi study contained many of the attributes that were found in the definition of the nursing process:

> CT in nursing is an essential component of professional accountability and quality nursing care. Critical thinkers in nursing exhibit these habits of the mind: confidence, contextual perspective, creativity, flexibility, inquisitiveness

> intellectual integrity, intuition, open-mindedness, perseverance, and reflection. Critical thinkers in nursing practice the cognitive skills of analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting and transforming knowledge. (p. 357)

The consensual definition that emerged through the Delphi study was limited because the study was without empirical support. Scheffer and Rubenfeld's (2000) consensual definition has not been adopted as the official standard for nursing education, practice, and research.

The American Association of Colleges of Nursing created a definition of CT based in its role of professional nurses as generalist baccalaureate nurses. Professional nurses required CT because they were expected to solve complex problems and to work in diverse clinical settings with diverse populations. The AACN defined CT as "all or part of the process of questioning, analysis, synthesis, interpretation, inference, inductive and deductive reasoning, intuition, application, and creativity. CT underlies independent and interdependent decision making" (AACN, 2004, p. 36).

Two models emerged in the literature after the NLNAC and AACN directed baccalaureate nursing programs to add CT to their curricula. Definitions, measurements, and evaluation of CT were to be determined by the nursing administration and faculty.

Descriptors of CT

Descriptive terms of CT are *creative, purposeful, goal-directed, inquisitive, curious, reflective, self-reflecting, self-listening, self-examining*, and *self-directed*. Characteristics of CT are the ability to listen to others, reconsider assumptions based on others' perspectives, have confidence in the ability to think, and produce reflective thoughts and say them with precision, clarity, and conciseness. Critical thinkers provide

rationales for the conclusions and for the outcomes; usually, there is supporting evidence for the outcome.

Complex thinking requires mastery of lower-level thinking, gaining and understanding words, and using the words correctly in their context and application. Critical thinking integrates lower-level and upper-level thinking to build a master picture with time and effort. Nursing students require a command of language to recognize what is happening in a situation and to see whether their reasoning of the situation is true. Reasoning using major command of language leads to self-monitoring and self-correction, when students understand what they were doing and then did it better. Teachers were awareness that mastery of the language was an element of CT, a lifelong journey, and needed to be part of the curriculum.

Nursing faculty understand that CT requires skill and practice to master (Alfaro-LeFevre, 2004; Brookfield, 1997; Riddell, 2007; Van Gelder, 2005). The practice of CT uses consciousness to bring information into the mind and to store that information in long-term memory. Nursing faculty understand that the more students practice thinking, the greater the potential for mastering CT. Nursing faculty engage students to activate and practice thinking skills by the following methods (Elder & Paul, 1996; Van Gelder, 2005) :

1. Presenting teaching strategies that required deliberate, full concentration to generate improvement
2. Presenting special exercises aimed at building up the skill
3. Providing graduated coursework moving from simple to complex learning
4. Providing close guidance and timely feedback that was accurate

Nursing faculty utilize teaching strategies that enable transference of students' learning across any situation and event. CT skills vary and are used in many contexts, domains, and territories that might require transference. Nurse educators make no assumptions that students' learning and practicing a skill in one specific situation will transfer knowledge acquisition to another situation. Nursing faculty members educate themselves to provide learning environments for students to learn and practice CT affective attributes and cognitive skills. Nurse educators facilitate CT development by challenging students to think abstractly and generate alternatives, such as what works in a situation or why it does not work in another. This type of teaching requires explicit guidance from the educator or facilitator.

CT is used in every aspect of individuals' lives. Individuals perform CT in social and political areas in their lives to make decisions about personal and professional financial matters. Critical thinking is difficult; people are unaware of thinking or even thinking about alternatives. Critical thinking (a) requires using alternative hypothesis, (b) goes beyond argumentation and reasoning, (c) requires evidence or supporting documentation—proof that what is said has legs to stand on, and (d) is an active step-by-step process that requires dedicated time, effort, and practice (Van Gelder, 2005).

Students and CT

Individuals prefer comfortable knowledge that easily make sense and that is established as truth, especially when that knowledge is suitable for personal lives (Brookfield, 1997; Elder & Paul, 1996; Van Gelder, 2005). Individuals rarely pursue further discussion of fundamental beliefs and truths; if assumptions and truisms make sense, rarely are they challenged by individuals. Complex thinking development requires

further questioning of traditional beliefs and information seeking of alternative ways of solutions and actions. Autonomous thinking requires self-examination of thoughts, asking oneself questions that increase understanding, and asking others about their thinking to obtain different perspectives. When individuals interact with others and listen to other individuals' perspectives on thinking, it promotes deeper analysis of personal thinking and increases comfort level for challenging truisms, established beliefs, and the CT process.

Nursing faculty does not expect students to critically think without the knowledge and familiarity of terms and skills relative to CT, and often students balk at being asked to do something of which they have no knowledge or familiarity (Brookfield, 1997; Kurfiss, 1988; Parr & Sweeney, 2006; Riddell, 2007; Walsh & Seldomridge, 2006). Nursing students enter learning environments expecting faculty to lecture and to provide information needed for testing and to give test questions that students will answer without much thought or difficulty. Knowledge acquisition results from obtaining information about subjects; learning complexities of subject matter develops CT.

The literature review revealed that students require satisfaction, confidence, and self-efficacy when participating in learning environments (Dreifuerst, 2009; Fountain & Alfred, 2009; Parr & Sweeney, 2006; Riddell, 2007; Walsh & Seldomridge, 2006). Nursing students live in highly technological environments where there is instant gratification and high stimulation. Technological environments must be considered by nursing faculty when planning teaching strategies, learning activities, and student outcomes. Parr and Sweeney studied students' experience with human patient simulation (HPS), and the results revealed that students found the experience rewarding and

challenging; however, students thought more preparation time and more information about the mechanisms of the HPS were necessary. Walsh and Seldomridge concluded from their study of HPS that nursing faculty needed education to identify the CT affective attributes and cognitive skills nursing students acquired using HPS and case scenarios.

S. J. Smith and Roehrs (2009) conducted a descriptive correlational study regarding factors that influenced student satisfaction and self-confidence when using high-fidelity simulation. The authors wrote the implications of their study for the nursing faculty were to have clearly defined learning objectives and teaching strategies that allowed students to learn CT. Clearly defined learning objectives and outcomes and carefully structured teaching activities enhanced student satisfaction and confidence. Nursing faculty needed an awareness of how to create challenging and invigorating learning environments where students learned and practiced CT. Nursing faculty were obligated to create learning environments that led to CT development and student satisfaction with the learning experience.

Nursing Faculty and Critical Thinking

Many nursing faculty enter educational settings from clinical practice without formal training in education. Frequently, nursing faculty members enter the educational settings from clinical practice and emphasize the clinical portion in their teaching (Childs; 2006; Jeffries, 2005; Mangena & Chabeli, 2005; Riddell, 2007; Staib, 2003; Turner, 2005; Zygmont & Schaefer, 2006). Changes have occurred in nursing practice that mandates changes in nursing education. Current nursing practice has become more complex because of sophisticated technology, and because individuals enter health care settings as consumers with knowledge of their health problems and treatments. Consumer

involvement in societal conditions is often reflected in health care changes that have influenced nursing education.

Nursing research results revealed that CT has improved the quality of nursing practice; yet, there is no consensus on the definition of CT (Riddell, 2007; Scheffer & Rubenfeld, 2000; Zygmont & Schaefer, 2006). Nursing faculty who are uncertain of CT definitions and descriptors might perceive teaching CT as a daunting task. Riddell wrote an argument on the gap between what was known about CT and how to accurately incorporate CT into nursing curricula. The nursing discipline had not formulated a consensual definition of CT. The directive from NLNAC and AACN to incorporate CT in curricula did not come with a definition of CT. Nursing school administrators and faculty complied with the directive by incorporating excerpted portions of the definition and description of CT that resulted from the American Philosophical Association Delphi study (N. C. Facione and Facione, 1994). Unless there is a consensus on the definition of CT, it is difficult to conduct nursing research that would examine whether a relationship exists between good nursing practice and CT.

CT is not a new issue to nursing education, research, and practice. A major issue in nursing education has been defining CT for nursing and methods of measuring and evaluating CT in nursing (Eisenhauer et al., 2007; Riddell, 2007; Scheffer & Rubenfeld, 2000). Scheffer and Rubenfeld performed a Delphi study using an international panel of 55 nurses experienced in education, research, and practice to form a consensual definition of CT in nursing. The challenge associated with not having a consensual definition of CT in nursing permitted nurse educators, practitioners, and researchers to interject personal meanings that influenced CT definitions. Personal interpretations of CT communicated

confusion and misunderstanding to nursing students and to nurse clinicians. A consensual definition helped to clarify the meaning of the constructs associated with CT and aided in developing instruction and evaluation tools specific for nursing.

Nursing faculty might question the validity of CT theory to practice without a consensual definition of CT in nursing education. The inconsistency of CT definitions for nursing practice results in questions about professional views of theory and how to incorporate theory in teaching. For example, nursing faculty members, unsure of the meaning of challenging assumptions, might ask for a description of it and how to teach it to others (Eisenhauer et al., 2007; Riddell, 2007; Scheffer & Rubenfeld, 2000; Walsh & Seldomridge; Zygmont & Schaefer, 2006). Implication for nursing faculty is to learn to critically review nursing research that determine teaching strategies for CT development. Nursing research provided guidance about CT through demystifying the definition and characteristics. Teaching strategies found in nursing research that encourage CT and develop self-awareness in students include simulation, questioning, case studies, role playing, journaling, and Socratic questioning. The literature review revealed that no one strategy is used in a single setting but that multiple strategies are incorporated to teach subjects (Flanagan & McCausland, 2007; Royse & Newton, 2007; Staib, 2003; Walsh & Seldomridge, 2006). Nursing faculty require evaluation criteria that provide evidence that determines when students move from simple to complex thinking, and when students are repeating and memorizing facts. Nursing research assists nursing faculty by identifying the indicators through studies performed on CT affective attributes and cognitive skills.

Advanced nursing education programs need to prepare educators for teaching CT affective attributes and cognitive skills to students. When advanced technology for

teaching occurs and is instituted in higher education, administrators establish staff development programs to teach and familiarize faculty with technological tools. Nursing faculty's familiarity with advanced technology prior to student use enhances the learning process. Nursing faculty learn the requirements necessary to facilitate learning by technological teaching. Nurse educators' familiarity with technological teaching tools cultivates their skills in the teaching and learning of CT.

Faculty development is necessary to prepare nursing faculty for creating learning environments and facilitating student learning. Novice nursing faculty requires educational courses and mentoring to create learning environments and facilitate student learning. Nursing faculty's education is based on teaching large amounts of content in a small amount of time (Mangena & Chabeli, 2005). The content is provided in student assessments, which students perform quickly and accurately because it is a matter of returning the content back to the teacher. Teaching strategies for CT provides meaning to nursing subject matter, which is significant for patients, health care organizations, and the nursing profession. Nursing faculty learn by means of advanced education that there is a confirmatory relationship between their knowledge of CT education and students' learning CT affective attributes and cognitive skills.

The epistemological position of nursing faculty members impedes the teaching of CT. If the epistemological position was that CT could not be taught but must be learned by the students, faculty would not use strategies that developed CT. When nursing faculty do not understand the nature of knowledge and how and what students think about knowledge, it impedes the development of CT attributes such as critical reflection,

inquisitiveness, challenging assumptions, and generating alternatives, which are hallmark features of CT.

Nursing faculty have inconsistent beliefs about what constitutes knowledge and knowing (Childs, 2006; Elder & Paul, 1996; Fulbrook, 2003; Mangena & Chabeli, 2005). Nurse educators' understanding of how knowledge is viewed by others poses a problem in teaching CT. Some nursing faculty believe that when students enter the nursing program, the only thinking that is required is the learning pathophysiology of diseases, disease signs and symptoms, and treatments. Nursing students think that the requirements are learning of subject matter and technical skills.

Congruent with inconsistent beliefs about knowledge acquisition, faculty members and students hold the belief that, in learning environments where teachers are subject matter experts, there is less flexibility for discussions. Faculty members understand that there is flexibility in learning and more than one right solution or alternative to a problem or situation. So, faculty members perform introspection about their role as the teacher and whether their perception of the role as subject matter expert impacts their teaching of CT. Nursing faculty, understanding adult learning principles, know that adults do not come into the learning environment to be treated and instructed as children. Adult maturity levels and life experiences preclude the use of pedagogical teaching strategies, which enhances CT affective attributes and cognitive skills. Nursing faculty create learning environments that build upon the maturity levels and life experiences of nursing students.

Life experiences, educational levels, and maturity levels also affect nurse educators' CT affective attributes and cognitive skills and their ability to teach CT.

Zygmont and Schaefer (2006) studied CT affective attributes and cognitive skills for nursing faculty using the California CT Skills Test instrument and then compared the measurements against those of graduate level nursing students. The researchers found that nursing faculty's CT affective attributes and cognitive skills were comparable to students in graduate level nursing education. A discussion of results indicated that nursing faculty's CT affective attributes and cognitive skills equaled the average seniors in universities. These findings suggest that life experiences and education of nursing faculty advance acquisition of CT affective attributes and cognitive skills. Findings from the study offered evidence that nursing students instructed by nursing faculty equipped with CT affective attributes and cognitive skills are more advantageous in learning CT. On the other hand, findings indicated that older nursing faculty members have diminished CT affective attributes and cognitive skills. Nursing education level, exhaustion, perhaps faculty age, and their belief that they know all about the subject impeded their ability to learn more and contributed to lower scores on the CT affective attributes and cognitive skills.

Nursing faculty, leaning on personal experiences in nursing education, tend to use teacher-centered strategies. Teacher-centered learning views students as receptacles of learning. In this setting, teachers view themselves as experts and responsible for students having the subject matter content. A tendency to think of themselves as experts and knowing all on the subject disregards the notion that teachers are colearners with students and should model the practice of being a learner.

Nursing faculty members who consider themselves as subject matter experts should consider their role in the student learning process. Nursing faculty members

examine their thoughts and feelings as colearners, and if their thoughts and feelings impede or facilitate the learning process. Nursing faculty, moving away from thoughts and feelings of superiority, embrace the challenges and responsibilities of being a role model of CT skills. Nursing faculty members continually educate themselves in current knowledge and nursing practice that enhance the preparation of nursing students to be innovative thinkers.

Teaching Strategies That Enhance Critical Thinking

The National League for Nursing Accrediting Commission charged nursing programs to integrate CT into their curricula and to show measurements by which students achieved CT (Martin, 2002; Parr & Sweeney, 2006; Riddell, 2007; Staib, 2003; Walsh & Seldomridge, 2006; Zygmont & Schaefer, 2006). Problems arose with this charge because nurse educators were unfamiliar with teaching and measuring CT. Riddell suggested that not having an articulated definition of CT in nursing created a dilemma for nursing programs establishing their own definition and measurement of CT. Because CT is an abstract and contextual process, nursing faculty consider the situations or circumstances in which CT occurs. When nursing students are given a case scenario using simulation-based teaching, students are expected to move beyond the literal observations and boundaries of classroom study and textbooks. Nursing faculty question which criteria are useful to determine that CT is achieved by students or if students realize that CT has been achieved. Walsh and Seldomridge suggested that nursing faculty review literature that establish criteria for defining and measuring CT. The following section discusses teaching strategies that aid nursing faculty in teaching and measuring CT affective attributes and cognitive skills in nursing students.

Human Patient Simulation

Clemons (2006) conducted a study to show the results of using constructivist pedagogy to meet the needs of increased technology and increased class sizes. The study used a case study and computer-assisted instruction to show how technology and class sizes helped undergraduate students in an architectural class develop skills in application of theory. The class size for the semester shifted from 20 to 44 students. The study emphasized that the course was self-paced, not self-instructed, although students were required to develop recurring themes and concepts, generate questions with answers, and provide analysis and synthesis of information. Clemons suggested, in the discussion of the study, that the learning outcomes achieved were increased listening skills and open-mindedness. Students met the challenge of generating and answering questions, which increased self-confidence. Discussion of the findings indicated that using the constructivist method enabled students to construct their own meaning and learning of concepts with facilitation from the instructor. This method of teaching coincided with using case scenarios in simulation nursing laboratories assisting students to understand and to apply nursing concepts.

Human patient simulators encourage students to understand clinical situations by thinking through case scenarios, generating questions, conferring with fellow students, and constructing meanings to the scenario. Generating possible solutions leads to the best solution and fosters creativity and inquisitiveness because students move beyond what is seen and known to seek and explore other solutions for simulated situations.

Human patient simulators allow nursing faculty to use self-paced modules throughout the semester (Abel & Freeze, 2006; Childs, 2006; Clemons, 2006; Comer,

2005; Jeffries, 2005; Kurfiss, 1988). Students self-pace through modules, learning critical reflection. Critical reflection is how to think about problems, create and debunk assumptions, generate questions, and construct personal meaning. Self-paced modules develop CT affective attributes and cognitive skills such as inquisitiveness, self-direction, independent thinking, challenging personal and others' assumptions, and teamwork.

Clinical simulation permits students to understand and apply knowledge to critical care situations. Comer (2005) used a clinical simulation and a case scenario of a patient with intensifying phases of hypoxia. Students identified pathophysiology and used the nursing process as each phase worsened. Study results revealed benefits such as safe learning environments, individualized learning, and reinforcement of classroom learning. Students benefited by observation of patient situations often not observed at clinical sites. Student reactions to case scenarios were excitement and inquisitiveness. Students perceived the importance of preparation for classroom teaching to enhance learning in clinical situations.

Jeffries (2001) studied differences in learning outcomes between simulation and lecture to provide instruction to nursing students. Learning outcomes were enhanced learning and cultivated CT skills in preparation for real-world nursing environments. Simulation, clinical experience, and alternative teaching methods prepared students to function as independent, safe, and competent health care managers. In contrast, the lecture and inadequate clinical experience provided procedural information but not the preparation students needed for multiple and complex health care problems facing novice nurses entering nursing practice (Jeffries).

The introduction of alternative methods of education such as simulation develops creativity and flexibility in student learning (Bambini et al., 2009; Brookfield, 1997; Brown et al., 2008; Cato et al., 2009; Childs, 2006; Comer, 2005; Fulbrook, 2003; Hawkins et al., 2008; Jeffries, 2005; Kurfiss, 1988). Students perform self-assessment and self-evaluation by journaling their thoughts and feelings about the simulated experience versus learning in the clinical experience. Writing skills promote reflection and thought as students write freely, unencumbered by the grading process and faculty scrutiny of writing. Creativity and imaginative thought evoke the need for further inquiry and understanding of personal thinking habits. Simulation-based teaching provides novice nurses with self-directness, autonomy, flexibility, and teamwork. Simulation-based teaching produces contextual learning that is transferable to social, community, political, and personal environments.

Satisfaction is a learning outcome for nursing faculty and students. Childs and Sepples's (2006) study revealed advantages of developing affective and psychomotor skills in associate degree nursing students with simulation of three scenarios of a mock code. Students reported understanding the benefits of simulation. Nurse educators' use of human patient simulation empowered students to use judiciousness in generating solutions for simple to complex problems. Students observed with HPS how their learning styles and personalities influenced the generating of solutions for simple to complex problems. Discussion of the results revealed that students thought groups were too large (five students) for all students to participate, so the weaker students did not participate. Limitations of the study were inadequate (a) preparation time (10 minutes), (b) number of teachers and assistants, and (c) space. Childs and Sepples concluded,

however, that interactive laboratory experiences with Sim-Man led to invaluable information, excitement, development of psychomotor skills, and CT.

Lecturing and Gaming

Lecturing is a traditional method of teaching nursing students (Burgan, 2006; Flanagan & McCausland, 2007; Jeffries, 2005; Royse & Newton, 2007; Tiwari, Lai, So, & Yuen, 2006; Walsh & Seldomridge, 2006). Lecturing is associated with teacher-centered environments, where teachers provide information to students, who reproduce the information in examinations or assignments (Barrett, Bower, & Donovan, 2007; Burgan). Advantages of lecturing are that novice nursing students need teaching on unfamiliar information and how to use the acquired information (Burgan). Lecture used in conjunction with teaching strategies such as questioning, gaming, discussion, and problem-based learning assists with the acquisition of knowledge. Lecturing provides the foundation for application of knowledge to real-life scenarios and complex health problems.

Gaming, as a teaching strategy, promotes the development of CT, critical reasoning, and transfer of information for generalist baccalaureate nursing students. An important concept of gaming is that students remain interested and engaged in the learning environment (Royse & Newton, 2007). Gaming mimics the highly technological world in which nursing students live. Like simulation, gaming creates real-life situations that increase students' ability to solve complex health problems through cognitive skills such as application, analysis, and synthesis (Flanagan & McCausland, 2007; Royse & Newton). Flanagan and McCausland found that gaming, an innovative teaching strategy for undergraduate nursing students, worked well when conjoined with lecturing.

Lecturing provided basic knowledge and theory, and gaming—building on the basic knowledge—provided foundation for CT affective attributes and cognitive skills acquisition such as confidence, information seeking, and collaboration.

Barriers exist for gaming as a teaching strategy (Flanagan & McCausland, 2007; Royse & Newton, 2007). It is labor-intensive and time-consuming for nursing faculty to structure games that fit the acquisition of higher learning skills. When using gaming, nursing faculty needs an awareness of the different learning styles and personalities of nursing students. Students felt threatened by competition and fear of ridicule if a wrong answer is given. Nursing faculty's role is to provide a safe learning environment using innovative teaching that promotes the development of CT cognitive skills and affective attributes.

Small Group Discussion

Nursing faculty members create learning environments where students interact with classmates and obtain feedback. Group discussion as a teaching strategy facilitates reflection. Reflection, an essential attribute of CT, requires nursing students to think about the subject, talk to others about their assumptions, produce insight into these assumptions, and receive feedback.

Group discussion develops sensitivity for cultural diversity, whether in nursing practice or social interactive environments. Nursing programs are awash with culturally diverse populations that require sensitivity within the groups that translates successfully into the multicultural health care environment. Group dynamics theory defines method of instruction as individuals coming together for extensive interaction and discussion (R. O. Smith, 2005). Group dynamics is a back-and-forth movement as students vacillate

between maintaining their individuality and connecting to group members to solve assigned tasks. The vacillating movement is fundamental for problem solving and critical reflection. Group dynamics help to grow and develop a cohesive group. Learning of group dynamics successfully translates from the learning environment into the work environment.

Facilitation is crucial in learning environments for group discussion. Nursing students discuss subjects from their frame of reference or learning experiences. Facilitators restructure students' questions and ideas to generate clarity and facilitate CT attributes such as inquisitiveness. Nurse educators facilitate learning by clarifying solutions and ideas, questioning students about perspectives and viewpoints generated, and integrating their meaning with subject content.

Small group discussion promotes learning through a collaborative effort of students. Small groups foster teamwork and allow an awareness and consciousness of diverse cultural backgrounds and beliefs. An awareness of other cultures and backgrounds facilitates CT skills necessary for working with complex and multiple health problems and multicultural populations. Students learn autonomy and independent decision making in small groups, and are intrinsically motivated by self-confidence to do health care management. Students in small groups role-play and create scenarios that stimulate CT (Berge, 2000; Brookfield & Preskill, 2005; Lunney, 2003; Martin, 2002; Staib, 2003). Members of small groups create scenarios, and facilitators generate questions and provide clear, realistic guidelines that promote independent and reflective thinking (Brookfield & Preskill).

Nursing faculty are active facilitators of CT, but equally important is that students be active learners and self-motivated in the learning process. Nursing faculty measure and evaluate CT through feedback from students about how they adapt to different teaching strategies. Study results revealed that students' reactions included inadequate preparation time, unclear instructions for case studies, and uncertainty of teaching strategy use (Clemons, 2006; Parr & Sweeney, 2006; Walsh & Seldomridge, 2006). Initial reactions to small group discussion were anxiety and uncertainty about expectations. As the class developed and knowledge was acquired through personal pursuit, students became confident in their ability to generate solutions for the simulated case study (Bambini et al., 2009; Ellermann et al., 2006; Harvard-Hinchberger, 2006; J. W. Schell & Black, 2002; S. J. Smith & Roehrs, 2009). J. W. Schell and Black's study results revealed that students involved in real-life simulations were more likely to use acquired learning when faced with new situations in personal and professional lives. Study findings revealed simulation created safe reliable environments that were nonjudgmental and self-paced and created high levels of thinking such as analysis and synthesis (Clemons; Parr & Sweeney; Walsh & Seldomridge). Students working in small groups learned collaboration and gained multiple perspectives, which were learning outcomes for CT.

Questioning

Students in small groups engage in collaborative learning through understanding different viewpoints and perspectives, and develop higher levels of thinking such as analysis and synthesis. In metacognitive learning, students do journaling and develop *what if* questions, which enhances the development of deductive reasoning. Using

metacognition, faculty and students generate questions about health care problems and seek solutions. Students become proficient in questioning, analysis, and synthesis. Lunney (2003) provided 10 strategies for CT development and accuracy in producing nursing diagnoses, one of which was challenging assumptions and inferences. Nursing faculty facilitated the CT development by giving students a list of data to make inferences and then using questioning to further develop CT. Questioning allowed for open discussion where students listened to what others said and received feedback their perceptions. Nursing facilitation provided clearer understanding and scrutiny of situations (Brookfield, 1997).

Nursing students learn analysis and synthesis as they challenge themselves by questioning their thinking in unfamiliar situations. Challenging personal assumptions and traditional nursing procedures brings discomfort that moves students from lower level thinking to higher level thinking. CT involves solving complex problems by challenging old assumptions and rethinking perspectives, beliefs, and values (Brookfield, 1997; Fulbrook, 2003; R. O. Smith, 2005; Van Gelder, 2005). The nature of nursing knowledge develops nurses who practice in environments where they make assessments and develop patient care based on uniqueness of the human behavior. Nursing knowledge and practice are individualized due to the uniqueness of human behavior (Childs, 2006; Fulbrook, 2003). Accurate assessment and implementation of patient care require nurses to use higher level thinking along with technical expertise.

An essential component of effective teaching and learning is eliciting questions from students. Student questioning leads to inquisitiveness as students seek resources for information acquisition and not memorization of facts (Kurfiss, 1988; J. W. Schell &

Black, 2002). J. W. Schell and Black wrote that, when students questioned former assumptions and previously learned knowledge, they learned verbalization and reflectiveness. Questioning and challenging resulted in formulation of new meanings and viewpoints and enhanced students' ability to hear others' viewpoints (J. W. Schell & Black). Students learned effective communication, learned possibilities for solving problems, and generalized learning to new and unfamiliar situations.

K. Schell (1998) wrote that faculty members often wrote and asked easy questions that required minimal cognitive thought for students to answer accurately. When nursing faculty members acquainted themselves with questioning methods, it elicited student responses requiring deep and complex thought. Open and flexible classroom environments allowed students time and practice for CT development, and allowed nursing faculty members to provide guidance and patience that developed higher-level thinking and questioning (Berge, 2000; Brockett, 1994; K. Schell). Time was needed for students to reflect on the materials, generate questions and answers, process the information, and challenge traditional and long-established assumptions. Self-confidence was built as students became excited about their ability to use CT affective attributes and cognitive skills to direct patient care accurately, safely, and competently.

Research studies revealed that students taught in learning environments where questioning is encouraged show more comprehension on examinations. Students in questioning environments ask more calculated questions from their discussions rather than from textbooks or teachers (Berge, 2000; Kurfiss, 1998; K. Schell, 1998). J. W. Schell and Black (2002) reported that students who used questioning generated trust,

reflectiveness, and self-motivation. Motivation was an essential factor for transference of information from learning environments to nursing practices.

Concept or Mind Mapping

Concept or mind mapping is a nonlinear teaching strategy that helps students evaluate how they think. Nursing faculty use concept or mind mapping to generate ideas and show relationships among ideas. Concept mapping removes irrelevant and insignificant materials and leaves a clear-cut map of the health problem. Concept mapping helps with evaluation, judgment, and prioritization of health problems. Abel and Freeze (2006) conducted a study to identify nonlinear relationships in concept mapping using the components of the nursing process. Findings from the study indicated CT development for ADN students.

Concept mapping assists students to develop CT cognitive skills by allowing them to use symbols to show links between concepts. Linkage of concepts promotes thinking, organizing, and structuring of relevant ideas. Concept maps produce data by brainstorming and collaborating and by analyzing, synthesizing, and evaluating the data to ensure accuracy of the nursing process (Abel & Freeze, 2006). Concept maps promote cognitive thinking by helping students to move from concrete to abstract thinking and from simple to complex reasoning (Ellermann et al., 2006). Concept maps provide a foundation for logical reasoning, information seeking, generating and challenging assumptions, generating solutions, and analyzing data to create solutions appropriate to the situation. Student outcomes are increased confidence, improved student-teacher interaction, improved participation, increased inquisitiveness, and excitement (Abel & Freeze; Ellermann et al.).

Concept maps enable students to prioritize problems generated from case scenarios and to organize health problems. Concept mapping initiates with a blank paper, facilitating creativity, contextual perspective, and open-mindedness. Creativity develops because thoughts are unhindered by rules. Contextual perspective and open-mindedness develop because nursing students see the different positions nurses assume while planning patient care.

Concept mapping supports scaffolding, which enables nursing students to build frameworks for solving health care problems. Concept mapping causes nursing students to reflect on their work and to identify relationships between or among parts for a unified solution. Nursing students identify and structure goals and objectives that offer healthy and positive solutions, and learn application of acquired knowledge to real-life situations. Active participation and teamwork occur as students reflect on their learning and become inquisitive about situations.

Computer-Assisted Instruction

Computer-assisted instruction (CAI) incorporates the nursing process and problem solving. Critical thinking cognitive skills are used to generate solutions. Questioning and reflection are key elements of CAI. Case scenarios of real-life situations pose problems and questions for nursing students to use CT cognitive skills. Computer-assisted instruction enhances CT and facilitates using CT affective attributes and cognitive skills instead of rote memorization of facts and traditional approaches to patient problems.

Klegaldie and White (2006) conducted a study using computer simulation to evaluate 26 postgraduate nursing students' learning outcomes in critical care nursing. The

study's purpose was to evaluate student learning in managing complex health problems, to promote professional interaction, to develop clinical problem-solving ability, and to enhance the nursing process. The virtual patient was developed with scripts and storyboarding and placed on a CD-ROM. The students and faculty were oriented to the virtual patient. Students worked independently in the school computer lab or at home. Case scenarios provided from simple to complex over the semester. Students met in small groups for discussions and questions regarding the case scenarios. Conclusions of this study were favorable. A questionnaire administered to students revealed that 83% of the students believed that the computer simulation assisted them in their clinical decision-making ability through critical reflection.

Case Study

Case studies facilitate reflection and exploration of information for patient care solutions. Nursing students examine case studies and extract parts thought to be significant. Case studies allow for generating multiple perspectives, viewpoints, and discussion to clarify and define problems. Case studies provide real-life situations for nursing students prior to moving into nursing practice.

Nursing students might enter nursing practice not experiencing many types of acute health care problems; case studies help by presenting many different types of health care scenarios and connect classroom theory to nursing practice. Conceptual perspective develops from exploring options for patient care within one case study. Open-mindedness and perseverance develops as nursing students persist in exploring details of the case study. Collaborative learning develops from discussing and generating alternative

assumptions and perspectives, and looking at and discussing others' viewpoints. Nursing students practice thinking about and working out solutions for health care problems.

Case Scenario

Case scenario is defined as a teaching strategy that provides in-depth analysis of real or simulated patient care situations that point out key course concepts (Billings & Halstead, 2005). Case scenarios conducted in open and nonthreatening learning environments support nursing students and teachers. Nursing faculty prepare case scenarios prior to class with questions to stimulate comprehension of key course concepts. Nursing students ask questions, make comments, and have their misconceptions corrected. CT by nursing students might introduce new concepts and techniques unknown or unfamiliar to nursing faculty. Questioning and comprehension of key concepts are critical components of case scenarios. Nursing students learn application of theory to practice, which increases knowledge and stimulates CT.

Advantages of case scenarios are stimulation of CT and problem solving. There are also disadvantages for nursing faculty and students. Nursing faculty require longer preparation time to create case scenarios and develop higher-level questions of key topics. Nursing faculty have difficulty in developing higher-level questions needed to stimulate thinking. Nursing students not prepared for class can become frustrated by the questions. Nursing students whose preference for traditional methods of teaching may become inactive participants during the case scenario presentation.

Case scenarios fit well with adult learning principles. Nursing students as adult learners desire active participation in learning environments. Adult learners like validation of prior learning and knowledge used in the analysis of a case scenario whether

a real situation or simulated. Case scenarios, used with other teaching methods such as questioning, concept maps, discussion, and chalkboards, result in collaborative learning environments for CT development.

Summary

Current health care environments necessitate that nurses enter the workforce autonomous and prepared to perform complex patient care management. Health care environments require nursing education curricula that prepare nursing students for practice. Developing CT affective attributes and cognitive skills benefit nursing education and nursing practice through the successful preparation of students who enter work environments capable of providing quality health care. Accurate clinical judgment and decision making are vital for care of diverse health care populations, rapid changes in health care delivery, technology, and patient safety

CHAPTER 3. METHODOLOGY

The purpose of this study was to identify which teaching strategies nursing faculty perceived as most effective for teaching critical thinking (CT) and for facilitating the transfer of CT affective attributes and cognitive skills into nursing practice. This study asked nursing faculty to identify which outcomes were most important in their teaching for CT development. This study sought to identify relationships that might occur among nurse educators when teaching CT relative to educational level, years of nursing experience, years of teaching nursing, levels of nursing programs, and courses teaching or taught. The following research questions guided this study:

1. What instructional strategies do nursing faculty report that they use to develop CT skills in their nursing students?

2. What do nursing faculty perceive were the most important critical thinking affective attributes and cognitive skills that contribute to effective nursing practice?

3. What do nursing faculty perceive were the most important outcomes of teaching CT to nursing students?

4. What relationship exists among educational levels, years of nursing experience, years of teaching nursing, teaching levels, and courses taught among nurse educators for teaching CT development in nursing students?

Researcher's Philosophy

CT is necessary for nursing education and nursing practice and assists individuals in becoming lifelong learners. Nurse educators facilitate CT development and transference through learner-centered environments where students practice CT to

understand and solve complex health care problems (Brookfield, 1997; R. O. Smith, 2005). Nurse educators encourage students to avoid complacency about learning and acceptance of traditional practices and to began challenging assumptions of only one correct solution to fit a problem (Childs; 2006; Clemons, 2006; Jeffries, 2005; Mangena & Chabeli, 2005; NLN, 2005; Riddell, 2007; Staib, 2003; Turner, 2005; Zygmont & Schaefer, 2006).

Theoretical Framework

Knowles's model of adult learning principles is consistent with CT development in nursing students. Nursing students enter learning environments at different levels of maturity and with different life experiences, which influence their manner of thinking and behavior. Personal or professional motivation influences CT development. Knowles's belief was that intrinsic motivation was greater than extrinsic in adult learners in higher education. Higher education institutions provide student-centered environments where nursing students begin to challenge personal thinking habits and biases. Nursing students learn to solve personal and professional issues, generate alternative solutions, and discover acceptable solutions with concrete rationales. Knowles's model is congruent with nursing students who exhibit autonomous learning as they progress through nursing programs.

The concept of CT in nursing education and practice was compatible with the 1990 American Philosophical Association (APA) definition of CT as "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based" (N. C. Facione & Facione,

1994, p. 3). Alfaro-LeFevre's (2004) definition of CT as "purposeful, informed reasoning both in and *outside* the clinical setting" (p. 5) coincides with N. C. Facione and Facione's APA definition because nurses used CT to make clinical judgments. Clinical judgments were decisions based on facts and evidence and required use of educational and professional skills, experience, and intuition (Alfaro-LeFevre). Scheffer and Rubenfeld's Delphi study (2000) contained many of the attributes found in the definition of the nursing process. Cognitive skills and affective attributes associated with Scheffer and Rubenfeld's definition of CT formed the questions on the survey instrument for this study.

Research Design

Research Design Strategy

This study used a mixed-method, descriptive, cross-sectional design. The research instrument consisted of a two-part self-report survey. The survey identified which teaching strategies used in classrooms and clinical experiences were effective for CT development in nursing students, which CT affective attributes and cognitive skills were most important for CT development, and which outcomes were most important for CT evaluation (see Appendix A for nursing faculty survey). The survey examined data of the selected demographics: educational levels, courses teaching or taught, years of nursing experience, years of teaching nursing, and teaching levels. Telephone interviews were conducted with participants who indicated on their survey a willingness to be interviewed (see Appendix B for telephone interview questions).

Following the first phase of data collection, a follow-up telephone interview was conducted with participants who chose to speak with me. The semi-structured interview

consisted of five closed-ended questions and used open-ended questions for interviewees to provide detailed information. Responses to the interview questions helped to demonstrate if interviewees had a clear understanding of the definition and application of CT in nursing education, and how responses to the survey and interview would add to nursing education.

Rationale for Research Design

Gall et al. (2003) wrote that survey research was useful and appropriate for educational research. Gall et al. wrote, "This type of research (sometimes called *survey research*) has yielded much valuable knowledge about opinions, attitudes, and practices. This knowledge has helped shape educational policy and initiatives to improve existing conditions" (p. 290). Polit and Beck (2006) described survey research as a method of obtaining information about "prevalence, distribution, and interrelationships of variables within a population" (p. 241). The importance of using survey research was the flexibility and the production of large amounts of data. Advantages of adding interviews to the survey were to obtain richer, in-depth data, and to help interpret outcomes.

Sampling Design

Population

The National League for Nursing (NLN) database of nursing programs was used to access the population of nurse educators at different levels of nursing education and levels of nursing programs. The NLN database consisted of 11,000 individual members and 1,100 institutional members (NLN, 2007).

Sample

The research design used a nonprobability convenience sample of 500 nurse educators teaching in associate degree, undergraduate, and graduate nursing programs. The sample included nurse educators teaching in classroom and clinical settings. The representative sample of nurse educators varied in educational level, nursing experience, teaching experience, teaching level, and teaching specialty.

A statistical power analysis was performed to determine a sample size to decrease the likelihood of a Type I error. A power analysis for sample size with input for *t* test, alpha error probability, effect size, and power was performed using the G*power 3 software (Faul, Erdfelder, Lang, & Buchner, 2007). The G*power 3 power analysis with an input of one-tailed *t* test, small effect size (0.3), 0.5 alpha error probability, and power of 0.95 resulted in a sample size of 111. The research sample of 500 nursing educators was inserted in the G*power 3 power analysis; according to the results, a sample of 271 nursing educators with an estimated response return of 102 faculty members was adequate.

Stratified purposeful sampling was used to select participants to be interviewed. Gall et al. (2003) suggested stratified purposeful sampling to provided rich and in-depth information about "characteristics of each type, as well as insights into the variations that exist across types" (p. 179).

Instrument

Kotthoff-Burrell's Survey: NP Faculty Views on CT

The permission to use and modify this survey was received from Dr. Ernestine Kotthoff-Burrell (2007), developer of the instrument. The nursing faculty survey used for

the study was a 36-item instrument developed for research by Kotthoff-Burrell that explored the views of graduate faculty in nurse practitioner programs on CT development. The instrument was used only for the purpose of Kotthoff-Burrell's study (E. Kotthoff-Burrell, personal communication, January 21, 2008). The literature review and review of the items by a number of experts in graduate nurse practitioner programs (Kotthoff-Burrell) established the construct and content validity for the nursing faculty survey used for the pilot study. The experts' comments from the review of the items led to revisions in the instrument prior to the pilot testing.

Kotthoff-Burrell (2007) pilot-tested a 26-item self-administered survey using a sample of 40 graduate faculty members from the top 10 graduate nurse practitioner programs in the western United States. The response rate of return was 50%. Limitations to the pilot study included the lack of generalizability of results to a larger population, the type of convenience sample, and a Cronbach's reliability coefficient of 0.67. The findings from the pilot study led to a revision of the primary research question.

Further revisions to the pilot study instrument were based on five cognitive interviews with graduate nurse practitioner faculty with expertise in CT in nursing education. Kotthoff-Burrell (2007) asked the participants for feedback on the following aspects of the instrument: (a) appearance of the instrument, (b) word clarity, (c) accurate interpretation of the questions, (d) accuracy in answer choices for the questions, (e) whether participants would answer each question and complete the survey, and (f) how participants would like to receive the survey (e-mail message or at home). The final survey instrument was evaluated for content and construct validity by B. K. Scheffer and

M. G. Rubenfeld and an additional doctoral-prepared nurse educator with expertise in CT.

The final adapted Kotthoff-Burrell survey instrument contained 36 instead of 26 items and was reduced from five to three sections. Section I was reduced to three general statements about CT. Section II combined the former Sections I and II to include the 10 affective behaviors and seven cognitive skills for forced choice items. Section III included two new rank-ordered questions and competing value questions for teaching CT in nursing education. One open-ended question was added for participants' comments regarding CT and nursing education. This question was optional. Section IV gathered demographic data.

Nursing Faculty Survey for This Research Proposal

The purpose of the two-part survey was to ask nurse educators to identify which teaching strategies they perceived were effective for CT development in nursing students and transference into effective nursing practice. Survey participants were invited to participate in a follow-up interview to further explore and describe their personal experiences with teaching CT. The theoretical basis for the instrument was the definition of CT and *habits of the mind* developed by Scheffer and Rubenfeld (2000). The survey required approximately 20 minutes to complete and consisted of two sections. The interview was not expected to last longer than 20 minutes. The design of the two sections for this study was the following:

Section I consisted of five closed-ended questions and one open-ended question that permitted participants to express additional thoughts about the relationship between CT and nursing education. The design of the survey was to raise the awareness of nurse

educators about which teaching strategies used in their classrooms and clinical experiences led to CT development. Closed-ended questions allowed nursing faculty to explore and to describe teaching strategies used in their classrooms to develop CT and to promote reflection on the most important CT affective behaviors and cognitive skills needed for CT development and for effective nursing practice. Nursing faculty ranked four competing values to evaluate CT outcomes. Nursing faculty indicated on the survey if they had formal instruction on CT.

Section II collected demographical information about participants. The congruency of the research questions and survey questions are shown in Table 1 (see Appendix A for survey questions).

Follow-up interviews collected data that allowed further discussion of participants' usage and application of teaching strategies and CT development.

Table 1. Congruency of Research Questions and Survey Questions

Research question	Survey questions
What instructional strategies do nursing faculty report that they use to develop CT skills in their nursing students?	1, 2
What do nursing faculty perceive were the most important CT affective attributes and cognitive skills that contribute to effective nursing practice?	3, 4, 8, 9
What do nursing faculty perceive were the most important outcomes of teaching critical thinking to nursing students?	5, 6, 10
What relationship exists in educational levels, years of teaching experience, years of nursing experience, years of teaching nursing, teaching levels, and courses taught among nurse educators for teaching CT development in nursing students?	7–13

Pilot Study

Pilot Study for the Nursing Faculty Survey Project

Following the Institutional Review Board approval of the research study, a pilot study of the nursing faculty survey was conducted using eight nurse educators from undergraduate and graduate nursing programs. There were 12 closed-ended questions and one open-ended question on the survey. Eight of the 12 closed-ended questions asked for demographic information. Nurse educators possessing master's and doctorate degrees in advanced nursing practice or education were targeted for the pilot study. An electronic request sent to nurse educators provided them with information about the study's purpose and invited their participation. The results of the pilot study were used to determine whether adjustments were needed in the construction of the survey questions. The nursing faculty survey was reviewed for content validity by two doctoral prepared nurse educators who were experts in CT.

The survey was placed on SurveyMonkey.com with a link for participants to return the survey. The participants were asked to return the surveys within 48 to 72 hours of the receipt of the electronic mail. A second reminder to complete the pilot study was sent 72 hours after the original deadline. The pilot study was completed within 1 week. Gall et al. (2003) suggested a pilot study for testing of procedures and indicated that two or three participants were sufficient.

Results of Pilot Study for the Nursing Faculty Survey Project

Fifty percent of the participants returned the pilot study survey. The results of the pilot study were recorded in percentages. Questioning was indicated by 100% of the participants as a teaching strategy used in their classrooms for CT development. Case

scenario, case study, and discussion were indicated by 75% of the participants as teaching strategies used in their classrooms for CT development. These teaching strategies were congruent with the teaching strategies identified in the literature review as most effective for developing CT in nursing students.

In the pilot study, 100% of participants identified discussion as most effective teaching strategy for transference of CT into nursing practice. Seventy percent of participants identified questioning, role playing, case study, and nursing care plans as effective for transfer of CT into nursing practice. The findings were congruent with the literature review that the teaching strategies were effective for CT development and transference into nursing practice. Conclusions were that all identified teaching strategies were integrated into simulation laboratory teaching and that nursing faculty could identify teaching strategies effective for CT development.

Participants in the pilot study rated the top five CT affective attributes and cognitive skills named as most important for effective practice as creativity (75%), intellectual integrity (75%), applying standards (75%), confidence (50%), seeking information (50%), analyzing (50%), and reflection (50%). The findings were congruent with the literature review (Alfaro-LeFevre, 2004; N. C. Facione & Facione, 1994; Scheffer & Rubenfeld, 2000).

The participants ranked the five competing values to evaluate CT in nursing education as relationship-centered care (1), CT (2), content knowledge (3), application of knowledge (4), and patient outcomes (5). The findings that relationship-centered care was rated as number one and CT as number two were consistent with the pilot study conducted by Kotthoff-Burrell (2007). The finding that relationship-centered care was

ranked number one as an outcome for evaluation in nursing education was incongruent with the results of the literature review. The literature review ranked CT development, patient outcomes, and application of knowledge as major values for evaluation (Alfaro-LeFevre, 2004; Bambini et al., 2009; Jeffries, 2005; Klegaldie & White, 2006; Royse & Newton, 2007; S. J. Smith & Roehrs, 2009).

The demographics of the pilot study participants were identified as primarily master's-prepared, female, and teaching health promotion and disease prevention in ADN programs. The mean number of years of nursing experience was 30, the age range was 45–54, and the number of years teaching in nursing education was 11–15 years. Seventy-five percent received CT education from seminars and educational programs. These findings were consistent with the results of the literature review.

Based on the findings of the pilot study, feedback from committee members, and an expert nurse educator, the following revisions were made to the initial survey:

1. One question was added to reflect which teaching strategies nursing faculty used in the clinical setting for CT development.

2. One question with Scheffer and Rubenfeld's habits of the mind and cognitive skills was divided into two questions identifying the 10 habits of the mind or affective attributes and seven cognitive skills.

3. Three open-ended questions were added to reflect teaching activities for CT affective attributes and cognitive skills development and measurement of satisfactory progress in CT development.

4. The demographic question for age of participants was removed.

5. Telephone interviews questions were added to the survey instrument. Nursing faculty were asked to check a box on the instrument if they were willing to participate in the interview process.

The revision process required resubmission of the instrument for review by the mentor and committee members and a telephone conference with the mentor and committee members. Based on the conference call, final revisions were made to the dissertation manuscript and the survey instrument; both were approved.

Privacy and Confidentiality

Human Subjects Approval

Human subject research approval was requested and received from the National League of Nursing to use its database of nursing programs. Approval was obtained from the Capella University Institutional Review Board (IRB), which ensured that the research study complied with ethical principles to protect the rights, safety, and welfare of participants in the study. Ethical principles included informed consent, confidentiality, and autonomy. Participants were notified that they had the right to refuse without penalty and that the submission of the survey indicated their consent to participate. Participants were notified that no treatment was involved. Participants' personal identification information was not required on the survey forms.

Protection of Privacy

The nursing programs were numbered for data collection purposes. The data collected were stored in a locked file cabinet at my home and in a personal computer that remained password-protected.

Participants were given the options of returning paper surveys by regular mail using the enclosed self-addressed and stamped envelope or by the commercial Web-based survey instrument format (http://www.surveymonkey.com). Participants using

Web-based surveys did not need personal identification. Participants' individualized user IDs and passwords were not communicated to me.

Ethical Considerations

The participants were informed of the benefits and risks of the study. The benefits increased the body of knowledge for nursing and provided evidence-based practice for educating nursing students. This study was beneficial for nursing faculty because it increased their awareness of their teaching of CT. This study had minimal risk. All information provided on the surveys and written notes were maintained in a secure manner. To ensure further privacy and confidentiality, stamped addressed envelopes were included for the return of the surveys.

The interviewees had a choice of three methods for contacting me: electronic mail, telephone, or regular mail. Names of the interviewees, which some interviewees chose to reveal, were known only to me and were not identified in the results. No other identifying information was needed for the interview. The personal information would be destroyed at the earliest possible time.

Online Survey Methodology Security

Protection of participants was achieved by obtaining permission to use the NLN database of nurse educators instead of randomly using names from public domains (Andrews, Nonnecke, & Preece, 2003). Participants were provided a letter with my credentials, purpose of survey, benefits of survey, how privacy and confidentiality would be maintained, and IRB approval. The purpose of the letter allowed participants to make personal and professional decisions to participate in the survey.

Data Collection

Nursing Faculty Survey

Fifty deans and directors of nursing programs received a letter of prenotification of the survey via electronic mail informing them of the upcoming survey. Deans and directors were sent the information packets within 7 days of notification by electronic mail. The packets contained informed consent letters, research surveys, and self-addressed envelopes for return of surveys. Informed consent letters advised each nursing educator that the return of the survey instrument indicated consent to participate in the research study. The nursing educator had the option of returning the survey via electronic mail or regular mail delivery. Participants' individualized user IDs and passwords protected anonymity in electronic surveys.

Follow-up e-mails were sent to the deans and directors of nursing programs 1 week after the initial request for completion of the survey. The e-mails restated the study's purpose and significance. The total collection time for survey responses exceeded the initial return time of 6 weeks. The data collection was performed during a 12-week segment of the spring semester. The dates of data collection were January 15, 2009, to April 15, 2009.

The nurse educators who responded to the survey and accepted the invitation to participate in the follow-up telephone interviews checked the box in the demographic section of the survey. Participants were asked to contact me by mail using the self-addressed envelope, telephone, or electronic mail. The researcher contacted participants who checked the boxed area to schedule the interview. Data collection was conducted by handwritten notes.

Interview Data Collection

Interviews were conducted by telephone with nurse educators who indicated on their surveys their willingness to be interviewed by me. After the interview, I read and compiled the handwritten notes and transcribed the data from the notes. The handwritten notes were summarized and interpreted, observing for recurring themes and patterns. Excerpts from the handwritten notes were incorporated into the conclusions of the study.

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 16.0 was used to tabulate and analyze the descriptive and inferential statistics. The data analysis for each question was as follows:

1. What instructional strategies do nursing faculty report that they use to develop CT skills in their nursing students?

   Frequency and percentage distributions were used to summarize the data. Central tendency mean and standard deviation were used to summarize nurse educators' responses regarding their use of the most effective teaching strategies for developing CT.

2. What do nursing faculty perceive were the most important CT affective attributes and cognitive skills that contribute to effective nursing practice?

   Frequency and percentage distributions were used to examine nurse educators' perception of what CT affective behaviors and cognitive skills were effective for nursing practice. Based on their responses, nursing faculty were offered an opportunity to write in what teaching activities they used to stimulate CT in nursing students. The qualitative responses were summarized and placed in a list.

3. What do nursing faculty perceive were the most important outcomes of teaching CT to nursing students?

   Frequency and percentage distribution were used to rank the four outcomes that nurse educators perceived as most effective for teaching CT to nursing students. Based on nursing faculty responses to survey questions 8 and 9, the opportunity to write in what was considered the most important measurements

for satisfactory achievement of CT was provided. These responses were summarized and placed in a list.

4. What relationships exist in educational levels, teaching experiences, teaching levels, geographical areas, and courses taught among nurse educators for teaching CT development in nursing students?

   Analysis of variance (ANOVA) was used to compare the means of the nurse educators' educational levels, levels of teaching, years of teaching experience, years of nursing experience, and courses taught to see if and what relationships exist when teaching for developing CT in nursing students. Multiple regressions were used to observe if any relationship exists between nursing faculty demographics and teaching CT.

Summary

Awareness and significance of the research study were important in obtaining participation for the study. A benefit of this research study was to add scientific evidence about using teaching strategies for CT development in nursing students and for transfer of CT affective attributes and cognitive skills into effective nursing practice.

A convenience sample of nurse educators from the NLN database participated in this descriptive research study to assist in learning about developing CT affective attributes and cognitive skills in nursing students. The research survey asked for nurse educators' perceptions of which teaching strategies and activities promoted CT development. Telephone interviews were designed for further exploration of nursing faculty's responses. Data analysis using SPSS 16.0 compiled data to describe which teaching strategies and activities were most effective for CT development. The significance of this research study was that it provided nurse educators an opportunity to think about and describe their teaching for CT development and to add to the body of knowledge regarding which teaching strategies promoted CT development.

CHAPTER 4. DATA ANALYSIS AND RESULTS

The purpose of this study was to identify the instructional strategies that nursing faculty perceived were most effective for teaching critical thinking (CT) and for facilitation of CT affective attributes and cognitive skills into clinical practice. This study aimed to identify which outcomes were most important when teaching for CT. This study also identified relationships that exist among nurse educators who teach CT relative to their educational level, number of years of teaching nursing, number of years of nursing experience, and courses taught. Nursing faculty perceptions on which teaching strategies would develop CT affective attributes and cognitive skills in nursing students were explored and described.

Study Design

This study was a mixed-method, descriptive, cross-sectional design using a two-part survey research instrument. The first part was a 13-question survey, and the second part was an interview. The return of the survey by participants indicated informed consent to participate in the study. The participants checked a box on the survey to indicate a willingness to participate in an approximately 20-minute interview. The interviews supported the quantitative data received from the surveys, provided in-depth information about CT development in nursing students. The study was conducted during a 3-month period beginning from January 15, 2009, to April 15, 2009.

Sample

The participants were selected from the National League for Nursing database of nurse educators, which included nurse educators from all regions of the United States. Fifteen letters of consent and 15 surveys were sent to each dean or director of 50 nursing programs, which included graduate, undergraduate, and associate degrees.

Data Cleaning

Seven hundred and fifty surveys were distributed, with a return of 143 and a 19.1% return rate of participation in the survey. Although there were missing data from the surveys, all 143 returned surveys provided usable data. Two participants declined to answer survey question 1, and data were compiled on 141 cases. In survey questions where three participants declined to answer, the data were analyzed on 140 cases. Participants answered all demographic questions with the exception of six participants who did not answer the gender item.

Telephone interviews were conducted following the termination of the data collection period. Twenty-three participants accepted the invitation to participate in a telephone interview and 12 of the 23 participants left contact numbers. Twelve telephone calls were placed. Five participants did not respond to follow-up phone calls. Seven participants responded to phone calls and seven interviews were conducted.

The educational levels were divided into two categories. The first category included the doctor of philosophy in nursing (PhD), doctor of nursing science (DNS), doctor of nursing practice (DNS), and doctor of education (ED.D). The second category included master of science nursing (MSN), master of science-related fields (MSRF), and master of arts (MA) CT and education.

Participants with an MSN often had educational tracts, which included public health, education curriculum, educational counseling, community health, education, education administration, and community and human resources.

The categories for data analysis were undergraduate programs and graduate programs. Undergraduate programs included an associate degree in nursing (ADN) and bachelor of science in nursing (BSN). Two participants taught in practical nursing programs, and one participant taught in a diploma program; these responses were counted with undergraduate programs.

Research Question 1: What Instructional Strategies Do Nursing Faculty Report That They Use to Develop CT Skills in Their Nursing Students?

Instructional Strategies Results Reported by Nursing Faculty

Participants teaching in the classroom perceived case scenario to be most effective for teaching CT. The findings indicate no difference in the means of the teaching strategies used in the classroom for effective CT development. The findings show no outliers when summarizing and describing the characteristics of the mean. The standard deviation of each teaching strategy falls within 68% of the mean on the normal distribution curve and indicated no variation in the teaching strategies. The findings revealed a larger dispersion of the standard deviation around the means for questioning and discussion but indicate no significance because the standard deviations fall within the 68% range on the distribution curve.

Table 2 summarizes the top five instructional strategies used in the classroom.

Table 2. Top Five Teaching Instructional Strategies Reported to Develop CT Skills in the Classroom

Strategy	*F*	*P*	*M*	*SD*
Case scenario	111	77.6	1.0	.2
Case study	97	67.8	1.0	.2
Questioning	83	58.0	1.3	.4
Lecture	71	49.7	1.0	.0
Discussion	70	49.0	1.4	.5

The qualitative responses for instructional strategies used in the classroom for CT development are summarized in the following list. Responses indicate current teaching strategies for CT development and use of technology and life experiences to create student-learning environments.

1. Evidenced-based practice
2. Off-campus excursion
3. Simulation
4. Thinking out loud
5. Student presentation
6. Teaching experience
7. Streaming video/PPT

Table 3 summarizes the data for the top five instructional strategies used in the clinical experience for CT development. The findings revealed that nursing faculty perceived that nursing care plans were most effective for teaching CT development in clinical experiences. The findings indicate there is no difference in the means of teaching

strategies used in the clinical experience. The findings for the standard deviations of the teaching strategies indicate no significant variation around the means.

Table 3. Instructional Strategies Reported to Develop CT Skills in the Clinical Experience

Strategy	*F*	*P*	*M*	*SD*
Nursing care plans	83	58.0	1.92	.27
Discussion	62	43.4	1.47	.50
Journaling	54	37.8	1.80	.40
Questioning	47	32.9	1.36	.48
Concept map	46	32.2	1.67	.47

The qualitative responses for teaching strategies used to develop CT in the clinical experience are listed as follows. The findings indicated current teaching strategies for CT development and use of technology and life experiences to create student-centered environments (Jeffries, 2005; Rothgeb, 2008; Staib, 2003; Tsui, 2002).

1. Groups projects/observational
2. Hands-on learning
3. Pre- and post-conferences
4. Presentation of patient situations
5. Simulations/scenarios
6. Walking rounds

Participants selected teaching strategies used in the classroom and clinical settings for developing CT. The findings suggested that nursing faculty perceived that questioning

92 (62.4%) was most effective in the classroom and clinical areas for CT development. Table 4 summarizes the data for the top five teaching strategies used in the classrooms and clinical experiences.

Table 4. Teaching Strategies Reported to Develop CT Skills in the Classroom and Clinical Experience

Strategy	*F*	*P*
Questioning	92	64.3
Discussion	85	59.4
Case scenario	46	32.2
Nursing care plan	34	23.8
Case study	39	27.3

Research Question 2: What Do Nursing Faculty Perceive Were the Most Important CT Affective Attributes and Cognitive Skills That Contribute to Effective Nursing Practice?

CT Affective Attributes Results

The findings revealed that a majority of the nursing faculty perceived inquisitiveness 104 (72.7%) as the most important CT affective attribute contributing to effective nursing practice. Table 5 summarizes the responses for the top five CT affective attributes.

Table 5. Top Five Affective Attributes of Teaching CT Skills

Attribute	*F*	*P*
Inquisitiveness	104	72.7
Intellectual integrity	93	65.0
Open-mindedness	90	62.9
Reflection	87	60.8
Flexibility	76	53.1

CT Affective Attributes Teaching Activities

Participants reported teaching activities used to stimulate behaviors and actions that measured satisfactory development of CT. In many instances, participants identified the same teaching strategies as the teaching activities. Teaching activities for specific teaching strategies are summarized in the following list:

1. Questioning—Analyze questions for correct and incorrect answers, asking to see whether things make sense or whether actions fit the problem, and asking the right questions to find the correct answers. Computer-based simulations with case scenarios and case studies, integrate research critiquing of articles, and poster presentations at honor society meetings. Using Bingo, in which the initial answer is built on by asking more questions, consider integration of new knowledge, and leaving time for questions exam reviews.

2. Case scenarios—Problem identification and students to research and cite rationales for interventions, hypothesize outcomes, look at patient situations in a variety of settings, and learn to analyze data to make informed decisions, use of Paul's elements of reasoning exercises nursing care plans, concept maps, questioning, and case studies.

3. Discussion—Lecture with open approach with reflective examples and open discussion. Debriefing after simulation concept mapping and case review of evidence-based practice. Discussion in the clinical setting using a Socratic methodology being devil's advocate. Identification of appropriate outcomes given various patient care situations and outcomes researched by students, examine policies and procedures for compliance. Developing multiple choice questions, case studies, and *what-if* questions.

4. Nursing care plans—Grand rounds with patient situations, information seeking, and transforming knowledge by working through calculations and problems and predicting how and what to do. Prioritizing of nursing diagnoses and integrating of patients' desires into the plan of care/outcomes as well as students' personal learning objectives. Facilitates evidence-based care, and working one-on-one with students in developing nursing care plans.

5. Journaling—For information seeking and discriminating ability, reflective journaling, and computer searches on standards

The findings were consistent with the literature review that multiple activities were needed to teach CT to nursing students (Clemons, 2006; Comer, 2005; Jeffries, 2005; S. J. Smith & Roehrs, 2009; Staib, 2003; Tsui, 2002; Twibell, Ryan, & Hermiz, 2005; Vacek, 2009; Weber, 2005). The qualitative responses provided a blend of teaching activities where the thread was clearly seen—that is, questioning elicits discussion, problem identification, and problem solving.

Cognitive Skills Results

Participants reported five top cognitive skills that contributed to the CT development and transfer into nursing practice. The findings revealed that nursing faculty perceived analyzing as the most effective CT cognitive skill. Table 6 summarizes the data for the top five important cognitive skills of CT development.

Table 6. Top Five Cognitive Skills of Teaching CT Skills

Cognitive skill	*F*	*P*
Analyzing	37	95.8
Information seeking	125	87.4
Logical reasoning	125	62.9
Discriminating	97	67.8
Transforming knowledge	95	66

CT Cognitive Skills Teaching Activities

Participants' responses for this question were similar to teaching activities for developing CT affective attributes. The participants' responses are summarized in the following list:

1. Using case studies, questioning, and concept mapping
2. Watching YouTube, movies, and CNN, and then having discussion
3. Using multiple-choice questions and testing orally by Socratic questioning and discussion
4. Examining research articles for evidence-based practice, and clinical and ethical situations
5. Using simulation to challenge thinking and seeking information to predict outcomes
6. Turning-point technology using lecture with review questions, and computer modules that build scenarios and care plans
7. Creating learning environments that include lots of fun

These findings were consistent with the results of the literature review. Current trends in nursing education were the use of high-fidelity simulation laboratories and other

technological tools because they integrated multiple teaching strategies that supported CT cognitive skills development (Childs, 2006; Comer, 2005; Dreifuerst, 2009; B. Smith & Johnston, 2002; S. J. Smith & Roehrs, 2009). The findings indicate that simulation and technology develop CT cognitive skills greater than CT affective attributes.

Research Question 3: What Do Nursing Faculty Perceive Were the Most Important Outcomes of Teaching CT to Nursing Students?

Outcomes of Teaching CT Results

Responses to question 3 provided quantitative and qualitative data. The majority of nursing faculty rated patient outcomes and relationship-centered care as the most important outcomes of teaching CT. Table 7 summarizes the findings on the most important outcomes of teaching CT.

Table 7. Ranking of the Most Important Outcomes of Teaching CT Skills

Outcome	*F*	*P*
Patient outcomes	66	46.2
Relationship-centered care	66	46.2
Application of knowledge	51	35.7
Content knowledge	31	21.7

Nursing Faculty Qualitative Responses on CT and Nursing Education

Qualitatively responses were analyzed for themes associated with nursing faculty perceptions on the relationship between CT and nursing education. One theme suggested that CT was vital to nursing education and practice but difficult to define by nursing

faculty and students and difficult to teach. Other themes on the relationship between CT and nursing education are listed as follows:

1. Students needed opportunities to feel responsible, which helped to develop thinking.

2. The role of the educator was to develop critical thinkers; students needed role models.

3. Nursing faculty needed to provide for actual demonstrations in the classroom and clinical, not just words.

4. Although content was important, facilitating the development of thinking, analysis, and reasoning skills was essential for application of CT; learning CT depended on the maturity and life experiences of students.

5. Not all students had the rudiments of reasoning; therefore, it was difficult to expand CT in the context of nursing.

6. CT was developed in nursing education but actually seen in nursing practice—as one participant wrote, "perhaps 6 months into practice."

7. Teaching CT must have started at the beginning of the educational process to allow time for CT development.

8. The purpose of teaching of CT was to encourage the building of broad mental models that reinforced sound principles of critical reasoning leading to deliberate practice.

Nursing Faculty Perception on Evaluation of CT Development

The participants reported, based on their teaching strategies, assignments, and testing activities, what measured satisfactory development of CT. One theme among nursing faculty was that CT could be difficult to define and describe, and because of this difficulty, there did not appear to be any valid measurement. Themes are summarized in the following list:

1. Passing the National Council Licensure Examination (NCLEX)

2. Positive outcomes: Passing NCLEX-type exams with questions at application or higher levels, application in clinical setting, patient care decisions, safe, competent, and compassionate care

3. Evaluation of application of CT through clinical situation or simulation, written assignments, discussion and presentations, looking at the whole picture with an open mind and reflect on their actions

4. Successful adaptation to the professional role in the clinical setting

The themes surrounding measurement of CT resulted from student-centered environments where nursing faculty acted as facilitators of learning and role modeled behaviors that developed CT. These findings revealed that the measurements were traditional and offered no new insight into measuring CT in students.

Research Question 4: What Differences Exist in Educational Levels, Teaching Experience, Teaching Levels, and Courses Taught Among Nurse Educators for Teaching CT Development in Nursing Students?

Educational Level

The findings indicate majority of the nursing faculty in this study are educated at the master of nursing. Majority of the responses about teaching for CT development and teaching strategies are based on nursing faculty at the graduate level of nursing. Table 8 provided data analysis for the educational levels of nursing faculty in this study.

Years of Nursing Experience

Among the nursing faculty who responded to this question (N = 141, 98.9%), the number of years of nursing experience ranged from 3–54 years and the mean was 27. 85 years. The years of nursing experience were divided into four categories. The mean year was consistent with the results of the literature review and the pilot study, which showed that the average nursing educator had approximately 30 years of nursing experience.

Table 8. Educational Levels of Nursing Faculty Participants

Educational level	*F*	*P*
Ph.D., nursing	21	14.7
Ph.D., related field	5	3.5
DNS	5	3.5
DNP	2	1.4
Ed.D.	3	2.1
MSN	100	69.9
MSRF	3	2.1
No response	4	2.8
Total	143	100.0

Courses Teaching or Taught

There were 138 valid and five missing cases. Frequencies (with percentages in parentheses) were pathophysiology, 13 (9.1%); health assessment, 25 (17.5%); management of acute and critical care illnesses (MACC), 41 (28.7%); health promotion and disease prevention (HPDP), 33 (23.1%); management of chronic illness (MCI), 13 (9.1%); evidence-based practice (EBP), 13 (9.1%); and missing, 5 (3.5%). Fifty-three participants (45.3%) taught in the clinical setting. The findings showed that majority of nursing educators teach management of chronic illness with health promotion and disease prevention. Courses were usually taught in the junior and senior years of the nursing program where the participants perceived that CT was exhibited. Research studies were typically conducted with junior, senior, and graduate nursing students as participants (Childs & Sepples, 2006; Ellermann et al., 2006; Klegaldie & White, 2006; Mangena &

Chabeli, 2005; Parr & Sweeney, 2006; Riddell, 2007; Royce & Newton, 2007; Shin, Jung, Shin, & Kim, 2006; B. Smith & Johnston, 2002).

Years of Experience in Nursing Education

Participants indicated on the survey the number of years of experience they had in nursing education, and the results ranged from 1–44 years. Responses included 142 valid and 1 missing cases. Frequencies (with percentages in parentheses) were 1–5 years 36 (25.2%), 6–10 years 33 (23.1%), 11–15 years 36 (25.2%), 16–20 years 11(7.7%), more than 21 years 26 (18.2%), and missing 1 (.7%). The findings revealed that majority of nursing faculty have been teaching in nursing education between 1 and 15 years (25.2%).

Level of Nursing Program Taught

Participants indicated on the survey the level of nursing programs taught. Responses included 134 valid and 9 missing cases. Sixty-one percent (61%) currently teach in BSN programs and 13% in ADN programs. Graduate programs included MSN (n = 29, 20.3%) and Ph.D. (n = 2, 1.4%). Overall were undergraduate nursing programs, 117 (81.4%); graduate nursing programs, 20 (14.0%); and missing, 6 (4.2%). The findings revealed that a majority of nursing faculty participants taught in undergraduate nursing programs. Table 9 summarizes the results of demographics characteristics of nursing faculty.

Table 9. Summary of the Demographics of Nursing Faculty

Demographic	*F*	*P*
Highest educational level		
Ph.D.	27	18.9
Master's degree	110	76.9
Subtotal	137	95.8
Missing	6	4.2
Total	143	100.0
Years of nursing experience		
0–15 years	19	13.3
16–30 years	63	44.1
31–45 years	56	39.2
46–54 years	3	2.1
Subtotal	141	98.6
Missing	2	1.4
Total	143	100.0
Courses teaching or taught		
Pathophysiology	13	9.1
Health Assessment	25	17.5
MACC	41	28.7
HPDP	33	23.1
MCI	13	9.1
EBP	13	9.1
Subtotal	138	96.5
Missing	5	3.5
Total	143	100.0
Years in nursing education		
1–5 years	36	25.2
6–10 years	33	23.1
11–15 years	36	25.2
16–20 years	11	7.7
> 21 years	26	18.2
Subtotal	142	99.3
Missing	1	.7
Total	143	100.0
Teaching level		
Undergraduate	117	81.8
Graduate	20	14.0
Subtotal	137	95.8
Missing	6	4.2
Total	143	100.0

The survey did not list all courses that nursing faculty were teaching or taught, so space was provided on the survey for nursing faculty to write in their courses. Those courses—classroom and clinical—are summarized in the following list, with the frequency of courses in parentheses:

1. Women's Health / Maternal and Child Health (27)
2. Pharmacology (13)
3. Research (9)
4. Fundamentals (18)
5. Professional Issues/Introduction to Nursing (11)
6. Gerontology (10)
7. Leadership, Management, and Community Health (15)
8. Medical Surgical (50)
9. Mental Health (12)

These courses were not inclusive but represented the courses nursing faculty were currently teaching and taught.

Analysis of Variance Results

Analysis of variance (ANOVA) was conducted to determine which relationships might exist among demographic characteristics of nursing faculty. The means of demographic characteristics with standard deviations in parentheses were level of nursing program, 2.08 (.62); years in nursing education, 2.70 (1.41); courses teaching or taught, 3.34 (1.39); nursing experience, 2.30 (.73); and educational level, 2.30 (.40). The findings indicate no differences between the means and no relationship between the demographic characteristics and teaching of CT. The demographic characteristics did not significantly

correlate with the teaching of CT. The findings revealed that courses currently being taught or were taught were significantly related to the teaching of CT development in nursing students. The findings revealed that level of nursing program, number of years in nursing education, years of nursing experience, and educational level were not related to the teaching of CT. An ANOVA was performed to describe the variance or whether the variance occurred by chance. Table10 summarizes the data for ANOVA results.

Table 10. ANOVA Results for Variation in Nursing Faculty Teaching CT

Variable	*SS*	*Df*	*MS*	*F*	Sig.
Level of nursing program					
Between groups	.1	1	.1	.1	.3
Within groups	16.5		118	.1	
Total	16.7		119		
Number of years in nursing education					
Between groups	1.0	1	1.0	.5	.5
Within groups	234.5		120	2.9	
Total	235.5		121		
Years of nursing experience					
Between groups	.0	1	.0	.0	.9
Within groups	62.9		119		
Total	62.9		120		
Educational level					
Between groups	1.0	1	1.0	.5	.4
Within groups	18.9		115		
Total	19.0		116		
Courses teaching or taught					
Between groups	1.4	1	1.5	.7	.3
Within groups	228.3		116		
Total	229.8		117		

An ANOVA was computed with independent variables (demographics) and dependent variable (teaching CT). The findings revealed a relationship between the teaching of CT and the years of nursing experience.

Regression Analysis

A linear regression analysis was computed with independent variables (demographics) and dependent variable (teaching CT) to predict the response of the dependent variable based on the independent variables. The aim of the linear regression was to predict whether nursing faculty demographics influenced an increase or decrease in the teaching of CT. The findings revealed no statistical significant in the teaching of CT and the demographic characteristics of nursing faculty. The findings revealed that the teaching of CT cannot be predicted by any demographic characteristic in this study. Table 11 summarizes the findings for the linear regression.

Table 11. Regression Results for Predictors in Nursing Faculty Teaching CT

	SS	*Df*	*MS*	*F*	Sig.
Regression	170260.0	5	34052.0	.3	.9
Residual	1.6E7	131	133655.9		

Note. Predictors: (Constant), highest educational level, years as a nurse, years in nursing education, teaching level, courses teaching or taught. Dependent variable: teaching strategy.

The coefficient of determination was computed to explain the lack of relationship between nursing faculty demographic characteristics and teaching CT. The findings indicate that less than 1% of the time can demographic characteristics predict the teaching of CT by nursing faculty.

Table 12 summarizes the findings for the coefficient of determination.

Table 12. Coefficient of Determination Results for Predictors in Nursing Faculty Teaching CT

R	*R* Square	Adjusted *R*	Standard Error of Square the Estimate
.1	.0	-.0	365.6

Note. Predictors: (Constant), highest educational level, years as a nurse, years in nursing education, teaching level, courses teaching or taught.

Gender

Gender participants' responses were 137 valid and 6 missing cases. Frequencies (with percents in parenthesis) were females, 131 (91.6%); males, 6 (4.2%); and missing, 6 (4.2%). Table 13 summarizes the frequency and percentage for gender.

Table 13. Demographics for Gender

Demographic	*F*	*P*
Female	131	91.6
Male	6	4.2
Subtotal	137	95.8
Missing	6	4.2
Total	143	100.0

Interviews

Interviews were conducted to add greater depth to the study by letting participants verbalize their thoughts and feelings about teaching CT. The telephone interview

consisted of five questions (see Appendix B). The last section of the survey provided a box for participants to check if they would like to participate in the telephone interview. The interviews did not exceed the 20-minute limit. Responses are summarized in Table 14.

Table 14. Participants' Responses to Interview Question About Teaching CT

Participant	Response
1	I discuss in smaller groups. Students develop questions such as "What else do I want to know?" and look for critical pieces of what's missing. CT is introduced in Fundamentals, where students draw a concept map for 24 hours diagramming their typical day. Reflecting, students recognize the amazing time spent on technology and not enough time on self-care. Then students wrote out five things they would like to do, give it to another student to critique, and passed it back. Students would design a day to take care of self, but don't neglect responsibilities. After that 24-hour period, students reflect on where they got the time to do the things, or some of the things they intended to do. (Final comment) Reflection piece is huge; write why they want to be a nurse, one good thing and one bad thing to improve on, and what will make them a good student. Share knowledge and ask what it means. Don't hold on to your knowledge and be afraid to share with students.
2	I teach upper level courses and undergraduate level and I think they understand the term. I think CT is introduced in the sophomore level in their first course, Foundations. I teach Pathophysiology and use CT in lecture. Students identify how the disease links up with more than one or two data, and it's a process. I use CT exercises with case scenarios, and a CT log where students chose an event such as ethical situation that involves reflection. Students reflect on their thinking, pull in research to refute or prove thinking, and understand why they thought as they did. It's thinking about thinking. (On measurement) Do a map—a visual of students' thinking about a disease, linkage in visual at all different levels. (Final comment) Nurse educator must be a critical thinker and reflect back on practice.

Table 14. Participants' Responses to Interview Question About Teaching CT *(continued)*

Participant	Response
3	I compare CT with nursing care plans. I use variable concept technique, Socratic question, and values clarification. I talk about CT and point out when they do it. I teach at first level, and my primary approach is using storytelling and case studies. (Final comment) I find these methods to be very effective, especially auditory illustrations—making things practical. I am amazed how well it works with low-performing students
4	I teach in a BSN completion program. The students were licensed registered nurses and had skills secondary to practice. In the classroom, we do case study, discuss scenarios, which is a statement for opinions. (Final comment) CT is a buzz word. Be honest—teaching CT is a new word in the last 20 years, but has been since Florence Nightingale's time. Why is something happening, reasoning, and nurses had done forever. It is different from memorizing. Find the rationale and reinforce the reasoning.
5	I teach third level students in a BSN program. The courses were Professional Skills and Foundations. CT has developed through reading content to understanding concept leading to knowledge and experience, which explains the dual nature of CT. Best approach taken in the classroom is case study. Students use content and knowledge. But I also use simulated practice in a controlled environment. Students develop questions based on reading the major or key concepts and do case presentations. (Final comment) We need to look at who is teaching students—not necessarily a clinical instructor will make an educator. Professional development is needed for adjunct clinical instructors.
6	I teach Foundations and Geriatrics. My classes were usually 70–75 students and it [is] sometimes difficult to use CT activities in the classroom. Best approach taken in the classroom is case study. However, in the classroom I use pair and share—that is, I might give a topic such as ageism and have students reflect on their own opinions of being old. In clinical, I work with students one-on-one, doing questioning and reflection—why did you make certain decisions, interventions, or priorities for your patient today?

Table 14. Participants' Responses to Interview Question About Teaching CT *(continued)*

Participant	Response
6 *(continued)*	(On introduction of CT) The topic is usually introduced in Foundations. There were no assignments assigned to the topic—just the definitions and how it is used in nursing. We were in the process of moving from a diploma to ADN curriculum and there is less time to teach now. (On effectiveness) Observation of student's performance in clinical based their CT. CT is hard to evaluate unless you were using higher level thinking. (Final comment) I think a major activity for CT is simulation, which involves clinical practice, journaling, and reflection. Questions in debriefing would be, "What would be better? What should you do different?" In Foundations, we use it for safety and restraints and developing more across the curriculum, especially in clinical courses such as peds, OB, and psych.
7	I use case study a lot with actual patient information. With a patient with cardiovascular disease, I might bring in liter bottles to show cardiac output. I might role-play the patient by telling them I am having a heart attack, what were you going to do for me? I still use NCPs, not like some of my colleagues who use concept maps. I think NCPs were better than concept maps to help students in pulling it all together. What I look at in effectiveness are students using logical reasoning. I look to see if students have the confidence in clinical to pull the information together they need to care for their patients, to know where to look for the information, to know when they don't have enough, and to ask for help when necessary. I look at their nursing care plans to see if there is a logic flow. To me, this is a critical part of the learning process. I teach seniors and don't usually talk to them about CT. I don't know if it is taught at the lower levels or if it is pointed out or defined. I just do the strategies and role-model, and I don't point out to them when they were critically thinking. I teach very large classes. I am teaching the summer class now of 50 students and I know my fall class is going to be 64 students. When I am teaching, it is not like I am thinking CT, but I do look at clinical judgment

Summary of Written Responses

Telephone interviews were designed to enhance the quantitative data. Participants used case studies with the highest frequency to teach CT. Case studies enabled students to examine concepts and apply the concepts to clinical situations. Majority of the interviewees taught at higher levels of nursing programs and perceived that nursing students had developed CT throughout the progression of the program. Participants' spoke of constraints for teaching CT such as large class sizes and quantities of content taught with time limitations. The importance of the interviews was that nursing faculty recognized that nursing students needed open and flexible learning environments that improved the development of CT affective attributes and cognitive skills.

Summary

This chapter provided the data analysis results of the survey for nursing faculty and their perceptions of teaching CT. The findings were that nurse educators did perceive that CT was necessary for nursing education and nursing practice but that it was difficult to define for faculty and students. Teaching strategies such as questioning and discussion were reported being used in classroom and clinical with higher frequency and percentage for effective CT development. Nurse educators were teaching for CT development but they were not saying to themselves "I am teaching CT" or to students "You were critically thinking." Nurse educators did look for certain skills and attributes in nursing students other than what could be ascribed to CT development.

CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS

Health care environments are constantly changing by introducing technology to provide wellness in diverse client populations and in clients with complex health problems. Nursing graduates were expected to enter health care environments with knowledge to manage diversity of client population and complex health problems. Often, nursing students do not encounter acute health care problems within clinical settings; and are unprepared to make clinical judgments in acute situations. Also, with limited availability in clinical settings, nursing faculty sought teaching strategies to assist nursing students to learn application of subject content. Nursing educators needed teaching strategies that assisted nursing students to effectively transfer knowledge and application into nursing practice.

Purpose of the Study

The purpose of the study was to identify nursing faculty perceptions of what teaching strategies effective for critical thinking (CT) development and facilitated the transference of CT affective attributes and cognitive skills into nursing practice. The study aimed to identify whether relationships existed among nurse educators when teaching CT relative to educational level, years of nursing experience, years of teaching nursing, types of nursing programs, and courses teaching or taught.

Study Significance

The literature review revealed that few studies were conducted about nursing faculty and their teaching of CT. The literature review revealed studies that described teaching strategies that promoted CT development in nursing students. Few research studies were about nursing faculty's thoughts and feelings about teaching CT or how they taught CT to nursing students. This research study examined nursing faculty perceptions on teaching CT, by exploring which teaching strategies were effective in the classroom and clinical experience, and which teaching activities enhanced teaching strategies, and which measurements showed satisfactory progress of CT development. This research study helped to establish evidence-based practices for instructional strategies in nursing education.

Nursing faculty used traditional pedagogy of teacher-centered environments. Brown et al. (2008) wrote that teacher-centered environments were sufficient to produce efficient nurses. However, with changing technology and the diverse population associated with health care, the need for more integrated and collaborative learner-centered environments was necessary. Nursing faculty and students formed partnerships in learning environments beneficial to personal and professional growth and meaningful learning. This study was designed to show the how nursing faculty are using current technological tools to meet the learning needs of students and facilitate learning into nursing practice.

The literature review revealed studies about teaching strategies used by nursing faculty effective for CT development. Teaching strategies included case study, questioning, concept mapping/logic models, simulation, role playing, lecture, and

discussion. The literature review revealed that the strategies were common nursing education, but because of directives from the National League for Nursing (NLN) and American Association of Colleges of Nursing (AACN) to incorporate CT as a curricula outcome, nursing faculty sought to know more about teaching and measuring CT (NLN, 2005; Parr & Sweeney, 2006; Staib, 2003; Turner, 2005; Walsh & Seldomridge; Zygmont & Schaefer, 2006). This study was designed to provide research for creating learning environments that enhanced student outcomes.

Design of the Study

The study design was a quantitative, nonexperimental, descriptive, cross-sectional design using a two-part survey. Section I of the survey included questions that allowed nursing faculty to explore their perceptions of teaching of CT. Section II collected demographic information about the participants. Telephone interviews allowed participants to further explore thoughts about teaching of CT and obtained detailed information about teaching CT.

The study significance was to describe which teaching strategies nursing faculty found to be effective in developing CT in their nursing students. Because of the barriers that exist in teaching nursing courses, understanding how nursing faculty expected to teach and measure CT development. This study sought to determine which CT outcomes nursing faculty expected to observe in their students using specific teaching strategies and activities. The study explored the perception of nursing faculty on which CT affective attributes and cognitive skills were necessary for effective nursing practice.

Discussion of Findings

Research Question 1: What Instructional Strategies Do Nursing Faculty Report That They Use to Develop CT Skills in Their Nursing Students?

The findings of this study indicate that nursing faculty participants perceived that the selected teaching strategies were effective in the classrooms and clinical settings for CT development in their nursing students. In this study, 14 teaching strategies, based on the literature review, provided nursing faculty participants an opportunity to choose the effective teaching strategies; participants were able to write in choices not listed on the survey. The top five teaching strategies perceived by participants as effective for developing CT were chosen based on frequencies and percentages of the sample size. The top five teaching strategies: (a) case scenario, (b) case study, (c) questioning, (d) lecture, and (e) discussion. Nursing faculty participants in this study reported case scenarios to be most effective for CT development in the classroom. Case scenarios, in conjunction with simulation, provided students with opportunities to analyze problems, to generate responses, whether correct or incorrect, and to find appropriate solutions. Self-confidence developed by thinking through patient problems and by formulating solutions that led healthy outcomes (Cato et al., 2009; Childs & Sepples, 2006; Eisenhauer et al., 2007; Fountain & Alfred, 2009; Weber, 2005). This finding was congruent with this research study's theoretical framework of Knowles's adult learning model that open learning environments allowed students freedom and safety to challenge traditions and to seek knowledge and practice beyond textbooks and classrooms (Atherton, 2004; Bambini et al., 2009; Brookfield & Preskill, 2005; Brown et al., 2008; P. A. Facione & Facione, 2007; Knowles, 1984; MacDonald, 2002; Tiwari & Yuen, 2006; Vacek, 2009).

This study's finding that case scenarios were appropriate for building self-confidence in nursing students, promoting analysis with deep and complex thought, and enabling comprehension on examinations was consistent with the literature review (Billings & Halstead, 2005; Brookfield & Preskill, 2005; Forneris & Peden-McAlpine, 2007; Fountain & Alfred, 2009; Hawkins et al., 2008). The study conclusion was that the average nursing faculty member used case scenario more in the classroom to develop CT. this study does not conclude that case scenario was the most effective teaching strategy, but used by participants with more frequency and higher percentage than the other teaching strategies in the survey.

Nursing faculty participants in this study reported use of case studies in the classroom as effective for developing CT affective attributes and cognitive skills such as reflection, contextual perspective, and analyzing. Nursing faculty participants reported that students were presented with patients' situations in a variety of settings and within simulation laboratories and were expected to discuss and ask questions that identified the problems. Students performed research that provided evidence of the analysis of the case study, identifying problems, stating rationales for interventions, and hypothesizing possible outcomes. Based on the participants' responses, the outcomes of these simulations resulted in CT affective attributes of inquisitiveness and reflection. This study finding was congruent with the literature review that case studies generated reflection, multiple perspectives, open-mindedness, and perseverance as nursing students explored multiple dimensions of patient health care situations.

The study participants reported how case scenarios, case studies, and human patient simulator used collaboratively increased knowledge, psychomotor skills, self-

confidence, and stimulated CT in nursing students (Billings & Halstead, 2005; Childs & Sepples, 2006; Comer, 2005; Ellermann et al., 2006; Jeffries, 2005; Klegaldie & White, 2006; Parr & Sweeney, 2006; Rothgeb, 2008).

Lecture is a traditional teaching strategy used by nursing faculty to impart large volumes of information to nursing students who are novice in nursing content and because of large class sizes of nursing students. Nursing faculty reported that lecture, discussion, and questioning used together enabled students to learn subjects, understand concepts, and apply unfamiliar information to variety of clinical settings. The findings of this study revealed that lecture promoted the development of CT affective attributes and cognitive skills such as information seeking, reflection, and transforming knowledge.

Nursing faculty participants reported discussion as an effective teaching strategy to promote reflection in the classroom and clinical experience. Nursing faculty used research as a method of getting students to review evidence-based practices and present the findings in open discussion. Discussion used in conjunction with lecture provided reflection, transfer of information, and application of knowledge. Discussion permitted students to hear and voice multiple perspectives and develop flexibility and open-mindedness. The conclusion from nursing faculty participants' responses indicated that discussion, lecture, and questioning on topics allow students to make judgments, assumptions, and provide rationales and positive outcomes for health care situations.

The findings of this study indicated that nurse educators believed that nursing care plans are effective in the clinical experience for a variety of patient care situations and participation in grand rounds. The CT cognitive skills derived from nursing care plans facilitated information seeking, transforming knowledge, and application. The conclusion

from this study was that nursing students using nursing care plans developed CT affective attributes such as inquisitiveness, intellectual integrity, and reflection.

Nursing faculty participants reported journaling used in the clinical experience was most effective for the development of reflection, information seeking, and discriminating ability. Kennison and Misselwitz (2002) conducted a study on journaling in the clinical experience and found that students reported having meaningful experiences of exploring their feelings and reflecting on their actions. Students reported realizing how the actions affected themselves and the patients. Based on this study finding, journaling elicited CT cognitive skills such as analysis and discriminating ability and CT affective attributes such as open-mindedness and flexibility.

Several studies have suggested that caution be taken with using journaling and other teaching strategies (Elder & Paul, 1996; Kennison & Misselwitz, 2002; Schaefer & Zygmont, 2003; B. Smith & Johnston, 2002; Twibell et al., 2005). To wit, students needed nursing faculty to provide structure and guidance about the outcomes of teaching strategies to make the subjects more meaningful. Nursing faculty needed buy-in from students to incorporate unfamiliar and multiple teaching strategies. Knowles's (1984) assumptions were that adult learners must be active participants in learning environments to facilitate the learning objectives. Knowles's assumption was that adult learners are self-directed who entered learning environments to have their educational goals satisfied. This assumption is incongruent with the learning in nursing education. The educational goals are facilitated through the guidance and direction of the nursing faculty. Nursing faculty designed the teaching strategies and activities that are suitable for the learning needs for students. Critical thinking development was not in the forefront when nursing

faculty were designing for learning needs. The findings of this study indicate that nurse educators were not thinking about CT development when preparing or teaching; the interest lies in the outcomes of teaching such as students passing examinations and succeeding in clinical experiences.

Nursing faculty participants reported the use of evidenced-based practice. Some examples reported by the participants included off-campus excursions, simulation, thinking out loud as the teacher, and student presentations as teaching strategies in the classroom to develop CT in nursing students. The findings in this study indicated that nursing faculty reported using group projects, simulation, pre-and post-conferences, personal digital assistants, and presentation of patient situations in the clinical experience for CT development. A conclusion of this study was that nurse educators do recognize the need to use multiple instructional methods for teaching nursing students as adult learners and incorporating nontraditional and alternative instructional methods.

Nursing faculty participants provided additional thoughts on the relationship between CT and nursing education. One participant wrote that CT should start at the beginning of nursing education to allow time for development. Another participant responded similarly and added that, although developed in nursing education, CT is actually seen in nursing practice "perhaps 6 months into practice."

The findings of the current study indicate nursing faculty participants perceived teaching content was important but facilitating development of thinking, analysis, and reasoning skills was essential for application of CT. One participant noted that all students did not have the rudiments of reasoning. The lack of reasoning led to difficulty in facilitating CT in the context of nursing. Participants' responses were comparative:

facilitating CT in nursing students depended on the maturity level and life experiences of students. Nursing students required a significant level of maturity when entering nursing programs that sustained the learning process and the completion of the educational process. The application of adult learning principles supported self-direction and CT development. Schaefer and Zygmont's (2003) study on the learning styles of nursing faculty found that students thrived in collaborative learning environments where the needs and goals were acknowledged by the instructor. Nursing faculty guided students through a process of developing an awareness of their ability to think critically. The awareness developed by nurse educators' use of teaching strategies such as simulation, case scenario, case study, discussion, and questioning in learning environments.

The findings of this study indicate that nursing faculty evaluated their beliefs and values of teaching CT and perceived the significance between nursing education and nursing practice. Commonality among nursing faculty reporting was strong belief and understanding of professional and personal teaching. Nursing faculty believed that no teaching strategy dominated as the most effective teaching strategy for CT development. Nursing faculty participants stressed large classes, time constraints, and large amount of content to provide to students preclude the teaching of CT. Nursing faculty awareness of the barriers that influenced the teaching CT supported the tasks of breaking through the barriers. The understanding of personal teaching philosophy and help from mentoring brought about breakthroughs (Atherton, 2004; Brown et al., 2008; Hawkins et al., 2008; Kennison & Misselwitz, 2005; Kurfiss, 1988; Mangena & Chabeli, 2005; S. J. Smith & Roehrs, 2009).

The findings of this study indicate that majority of nursing educators participants do not have formal education in teaching CT. Seventy-seven percent of nursing educators reported no formal education in CT. The findings of the study indicate the educational backgrounds of nursing educators were insufficient to teach nursing studies. This finding was substantiated by the nursing faculty who used continuing education in CT to augment instructional strategies. Zygmont and Schaefer's (2006) study of CT skills of nursing faculty found educational level to be an attribute contributing to the lower CT skills of nursing faculty. The majority of the nursing faculty participating in the current study wrote or stated in the interviews that not having formal education in CT did not impede their ability to teach CT. The American Nurses Association (ANA; 2007) position statement declared insufficient education of nursing faculty on the technological needs that prepared students for nursing practice. Nursing faculty recognize the importance of a formal nursing education in CT, which enhances the teaching and improved the learning environments for students. This education might not be formal as in a nursing education program curriculum but performed through faculty development, continuing education, sharing of information among faculty, pairing junior faculty with senior faculty, and mentoring (Brown et al., 2008; Hawkins et al., 2008; Walsh & Seldomridge, 2006; Zygmont & Schaefer, 2006).

In recent years, there has been a shifting paradigm in nursing education to meet the need of students in an era of highly technological communication (blogs, iPods, and PDAs). The National League for Nursing (2005) recommended that nursing educators use research-based pedagogies to create learning environments advantageous to students, nursing education, and health care partnerships. The focus of the pedagogies was the

movement into learner-centered environments. Learner-centered environments were fertile foundations that produced CT cognitive skills and affective attributes such as reflection and applying knowledge. Nurse educators, despite not having formal education in CT, created valuable learning environments in which they modeled creativity, inquisitiveness, open-mindedness, and reflection, and were co-learners with their students, all important aspects of teaching CT.

Research Question 2: What Do Nursing Faculty Perceive Were the Most Important CT Affective Attributes and Cognitive Skills That Contribute to Effective Nursing Practice?

The findings of this study indicate that inquisitiveness was an important affective attribute for nursing practice. Nursing faculty selected teaching strategies such as questioning, case scenarios, discussion, and case studies that promoted the development of inquisitiveness. Scheffer and Rubenfeld's (2000) defined *inquisitiveness* as "eagerness to learn" (p. 358), which required questioning and exploring possibilities, alternative viewpoints, and challenging assumptions in patient care situations. Nursing faculty used activities in conjunction with simulation that promoted CT affective attributes. Mainly, teaching with simulation produced CT affective attributes.

Participants in this study did not point out any teaching strategy that matched with a specific attribute. Case studies incorporating Bingo generated questioning and discussion and leaving time for questions after examination reviews promoted inquisitiveness. The teaching activities are comparative to Scheffer and Rubenfeld's (2000) definition of *habits of the mind*, which require students to rely on past experiences and incorporate new knowledge. Teaching activities resulted in gaining deeper thought and greater perspectives on situations. Nursing students acquired methods of challenging

assumptions and previous learning, gaining insight into biases, and looking at others' perspectives, which were necessary for CT development and transference into nursing practice.

This study's findings are consistent with the results of the literature review, which showed that nursing students developed CT affective attributes such as inquisitiveness open-mindedness, reflection, and flexibility when using multiple teaching strategies (Billings & Halstead, 2005; Brown et al., 2008; Burbach et al., 2004; Flanagan & McCausland, 2007; Harvard-Hinchberger, 2006; NLN, 2005; Schmidt & Stewart, 2009; Staib, 2003). Intellectual integrity was not a significant CT attribute in the literature review; whereas creativity was cited as a significant CT attribute in the literature review but not perceived by nursing faculty in this study to as effective for CT development.

Fifty-eight percent of nursing faculty in this study reported using nursing care plans in clinical experiences for teaching CT. Nursing care plans emphasized prioritizing of nursing diagnoses and integrating patients' desires and students' personal learning objectives into the plan of care. Scheffer and Rubenfeld's (2000) definition of CT and the nursing faculty's top five choices on the CT cognitive skills indicate that nursing care plans fulfilled the criteria for developing CT. Habits of the mind developed were flexibility, intellectual integrity, and inquisitiveness. In contrast, other habits of the mind such as contextual perspective and creativity might facilitate CT development using nursing care plans.

Nursing faculty in this study perceived that analyzing was the most important CT cognitive skill for effective nursing practice. Nursing faculty responses for activities for development of cognitive skills mirrored the activities for affective attributes with some

exceptions. Nursing faculty reported using activities such as viewing CNN, YouTube, and movies followed by discussion for CT cognitive skills development. Turning point technology used lecture with review questions and computer modules that built scenarios and care plans were activities that promoted CT cognitive skills. Participants reported that learning environments that included lots of fun developed CT cognitive skills. Teaching activities such as multiple-choice questions, Socratic questioning, and discussion aided in transferring CT into nursing practice. Collectively, participants named case studies, questioning, concept mapping, and discussion as major activities for developing CT cognitive skills for nursing practice. Nursing care plans elicited cognitive skills such as information seeking, discriminating, and logical reasoning. Challenging and exciting learning environments incorporating students' life experiences were consistent with Knowles's (1984) principles of adult learning.

The study findings indicate that nursing educators' choices of teaching activities are congruent with learning environments that utilized adult learning principles. Principles of adult learning assumed that adults learn best when their goals for learning were recognized and incorporated into the curriculum objectives (Atherton, 2004; Berge, 2000; Brown et al., 2008; Cato et al., 2009; Driscoll, 2005; Hawkins et al., 2008; Holton, 2005; Knowles, 1984; B. Smith & Johnston, 2002). Adult learning principles rely on developmental levels and past experiences that enhanced the learning of new and unfamiliar subjects. Faculty using multiple teaching strategies and activities met the learning needs and learning styles of diverse student populations. Nursing faculty create safe and flexible learning environments where students thought about the prior learning experiences and integrated the experiences into learning new knowledge, which resulted

in a meaningful experience. Meaningful learning experiences were beneficial in nursing situations and helped novice nurses when encountering unfamiliar patient situations in nursing practice.

Research Question 3: What Do Nursing Faculty Perceive Were the Most Important Outcomes of Teaching CT to Nursing Students?

The findings of this study indicate that nursing faculty ranked patient outcomes and relationship-centered care equally important as outcomes of satisfactory CT development. Patient outcomes are important for developing relationships with diverse patient populations. Nursing students enter health care environments equipped to use technology to manage care of patients with multiple and complex health problems. Relationship-centered care was important for students to learn how to develop and cultivate patient-nurse relationship that are beneficial to the patient and the nurse. Relationship-centered care and patient outcomes development resulted in positive health care management for patients and nurses (Alfaro-LeFevre, 2004; Bambini et al., 2009; Cato et al., 2009; Cleary-Holdforth, 2009; Fountain & Alfred, 2009; Schmidt & Stewart, 2009; S. J. Smith & Roehrs, 2009). The findings were significant; nursing students transfer principles and concepts of nursing into work environments, especially when encountering unfamiliar situations. These findings were significant; the nursing student progress seamlessly in nursing practice from a novice nurse to an expert nurse.

Survey findings revealed that nursing faculty ranked outcomes in order of satisfactory development of CT as patient outcomes, application of knowledge, content knowledge, and relationship-centered care. Activities supporting the ranking of the outcomes and satisfactory progression were passing NCLEX-type questions on

examinations, passing NCLEX at application or higher levels, application in clinical setting, patient care decisions, and safe, competent, and compassionate care. Nursing faculty in this study reported that from participants' personal knowledge "we don't have any 'valid' measurement other than that student can demonstrate by exam or verbally that they can apply knowledge." This finding was congruent with the literature review that no consensual definition of CT was available to nurse educators (Eisenhauer et al., 2007; Riddell, 2007; Scheffer & Rubenfeld, 2000; Walsh & Seldomridge, 2006).

Study participants perceived that successful adaptation to the professional role in the clinical setting indicated satisfactory progression. Patient outcomes were ranked as number one in the perception of satisfactory progression in CT development. Nurse educators reported that application of knowledge in clinical situation or simulation, written assignments, discussion, and presentations were more indicative of satisfactory progress. Knowles's (1984) principles of adult learning CT development assumed that learning occurred with growth and development, maturity levels, and life experiences (Atherton, 2004; Holton, 2005). The study participants agreed that students developed CT over time. And that by introducing CT to students in the freshman year of education, by the junior and senior year CT was developed. The participants' response that CT develops over time was substantiated by research on CT development and teaching strategies was conducted using junior and senior undergraduate students and graduate students.

Several studies revealed that student satisfaction was an important outcome of CT development (Bambini et al., 2009; Dreifuerst, 2009; Ellermann et al., 2006; Parr & Sweeny, 2006; Schmidt & Stewart, 2009; Walsh & Seldomridge, 2006;). Students were

accustomed to teacher-centered environments and needed adequate instruction and preparation on the use of variety of teaching strategies to promote CT. Nursing faculty's role was to ensure that nursing students were able to define and understand CT, and to know when they were exhibiting CT affective attributes and cognitive skills. The activities promoted buy-in from students and decreased anxiety of entering into different learning environments. Nursing faculty evaluated the outcomes of CT development and students recognized and gained confidence in their ability to think critically. This self-confidence will be observed in clinical settings and transferred into clinical practice.

Research Question 4: What Relationships Exist in Educational Levels, Years of Nursing Experience, Years of Teaching Nursing, Teaching Levels, and Courses Taught Among Nurse Educators for Teaching CT Development in Nursing Students?

The survey findings for demographic characteristics of the 143 nursing faculty participants revealed that the majority were of the female gender. This finding was consistent with national statistics that men were a minority in nursing education. The Southern Regional Education Board (2002) conducted a survey with gender as a variable. Nursing education units within that region had 95% female and 5% male nurse educators, and coincided with the national level of 96.5 % female and 3.5% male educators. Gender was not used as a variable in this study because of the high number of female nurse educators.

Teaching for CT required knowledge and application of teaching strategies that improved CT in adult learners. Nursing faculty may possibly enter nursing education from clinical backgrounds. This traditional situation might be changing with current trends in nursing education and health care environments that required nurses to be proactive in nursing practice and to apply knowledge of complex health problems and

health care technology (Bambini et al., 2009; Brown et al., 2008; Ellermann et al., 2006; Hawkins et al., 2008; Walsh & Seldomridge, 2006; Zygmont & Schaefer, 2006). This study concluded that nursing faculty needed formal education and an awareness of how to meet the challenges of teaching students for rapidly changing and highly technological health care environments.

The findings of this current study revealed that a majority of nursing faculty survey participants had been in nursing education between 1 and 15 years. This finding might indicate that experienced nurses start their careers in nursing education. Other findings of the current study indicate that nursing faculty enter nursing education after clinical experience or nursing faculty enter nursing education earlier in their career because of the current trend for public and private agencies and organizations to provide funding for nursing faculty shortage relief.

The findings of this study revealed that the majority of the participants held master of science in nursing or a related field in health care or education. One participant held a master of arts in creative CT and education and using Paul's elements of reasoning exercises, a method earned in the master of arts program. This formal educational background provided a heads up in teaching CT. With this educational background, yet nursing faculty might enter nursing education with clinical backgrounds and teach from a technical perspective or according to their nursing education. Current literature revealed that nursing education programs design curricula to prepare nurses for nursing practice and universities provided faculty development for teaching in the current educational environment (Flanagan & McCausland, 2007; Galloway, 2009; Hawkins et al., 2008; NLN, 2005; Riddell, 2007; Schaefer & Zygmont, 2003). The findings from this study

were consistent with current literature indicating that the greatest growth nursing education preparation was at the levels of master's and doctoral degrees (ANA, 2007; Southern Regional Education Board, 2002).

The study findings indicated that nursing faculty participating in this study taught in student-centered environments. Previous studies showed that there was a trend by nursing organizations and research-based evidence to shift toward a student-centered environment (Cleary-Holdforth, 2009; Galloway, 2009; Hawkins et al., 2008; NLN, 2005). The findings from the study revealed that the number of nursing experience years influenced the teaching of CT and whether the learning environments were student-centered or teacher-centered (Flanagan & McCausland, 2007; Riddell, 2007; Ridley, 2007; Zygmont & Schaefer, 2006). The findings revealed that the majority of the study participants did not choose teaching evidence-based practice (EBP) on the survey although current trends in nursing education focus on using EBP to teach nursing students the principles and concepts of nursing.

There were significant differences at the levels of teaching of CT among the nursing faculty participants. The findings of this study indicate that nursing faculty teaching at the graduate level tended to use teaching strategies that focus on CT. At the undergraduate level CT was introduced in subjects such as Fundamentals of Nursing but nursing faculty focus was on teaching technical nursing skills. These findings are consistent with study participants' responses that CT was exhibited among nursing students at higher levels of education and after being in nursing practice for 6 months or longer. The findings from this study indicate that nursing faculty teaching advanced

nursing courses did not think nursing students needed reminding that they are thinking critically or when CT occurred.

ANOVA findings revealed that no differences existed in the means of the demographic characteristics of the nursing faculty participants and teaching for CT development. The study findings showed no large dispersion of the standard deviation around the means. The study concluded that the nursing faculty participants used diversity in teaching across the levels of the nursing programs. No distinction was observed in teaching for CT development. The findings were consistent with Schaefer and Zygmont's (2003) study that described teaching styles of nursing faculty teaching in baccalaureate programs and whether the nursing faculty created learning environments conducive to teaching CT. The authors' quantitative results revealed that nursing faculty still taught in teacher-centered environments with an emphasis on providing content rather than helping studies to learn and qualitative responses indicated that nursing faculty seemed ready to move forward to student-centered environments. The findings revealed no relationship between the demographic characteristics of the nursing faculty and the teaching of CT.

Strengths and Limitations

One limitation of survey research was self-administration because answers were based on the participants' self-reported perceptions, attitudes, knowledge, educational level, and reading ability.

The use of the commercial Web-based survey instrument format for the research survey was a limitation because the Web address was included in the letter of informed consent and inconvenient to access. A solution to this limitation would be that nursing

faculty received an electronic copy of the letter with direct link to the Web site. The direct link was included in the letters to the deans and directors. There were 17 responses posted on SurveyMonkey.com, which had the potential to limit the representativeness of the survey findings.

Another limitation to data collection was the method of contact for interviews. The participants either called or wrote contact information on the survey. Participants who called either left no contact number or—if a number was left, when I returned the call, were often unavailable. Participants who left contact information on the survey were easier to contact and more available than participants who called the contact numbers. Participants did not use e-mail for contact. These limitations also had the potential for limiting the representativeness of the sample.

The study sample response size was small. The power analysis conducted resulted in a sample size of 111 responses and a 38% return would be adequate. The actual sample size exceeded the proposed size and the actual percent of return was approximately half of the proposed return. Based on the study sample size, the findings could not be generalized to the population of nursing faculty. The findings did indicate that the majority of the nursing faculty were female and master's-prepared nurses. This was congruent with the literature review regarding educational level of nursing faculty (AACN, 2004; ANA, 2007; NLN, 2007; Southern Regional Education Board, 2002).

Implications

Critical thinking is not a new concept to nursing. As one participant said, "It's been around since Florence Nightingale's time". Nursing faculty and nursing students ought to have an understanding of the definition of CT, cognitive skills and affective

behaviors, and how to evaluate the outcomes of CT. Critical thinking development required that faculty know how to create learning environments where teaching and learning are based on adult learning principles and adult learning styles were recognized as unique to each student.

Nursing faculty need an awareness of their understanding of CT. The study indicate that essentially for nursing faculty was to concentrate on developing CT as nursing students progress through the nursing program. Nursing faculty needed support such as faculty development and mentoring that assisted in creating flexible, enjoyable, and open learning environments. The learning environments helped facilitation of CT development and transference of CT into nursing practice.

Nursing faculty needed support to become proficient in the current technological teaching strategies that promote student learning. The health care environment present as a rapidly changing technological delivery system and nursing students needed preparation to enter these environments with confidence to manage patient care problems and grow and develop as a nurse.

Recommendations

Recommendation for Nursing Education

Nursing faculty needed the educational background to create student-centered environments that support CT development. Nursing faculty needed formal education and mentoring that facilitates the teaching necessary for nursing students to transfer into nursing practice, where they encounter multiple complex patient situations. The use of high-fidelity simulation integrating multiple teaching strategies produced outcomes such as CT cognitive skills and affective attributes, clinical judgment, and development of

psychomotor skills. Current research recommended that nursing programs review and revise curricula to focus more on courses that aided faculty in developing CT as role models and enabled them to generalized CT behaviors to students.

The current thinking was for nursing faculty to create student-centered environments where students are active participants in their education. Time and preparation are needed by nursing faculty for each teaching strategy to maximize the learning experience for students. Faculty learned to facilitate student buy-in when introducing new or unfamiliar teaching strategies to nursing students. Faculty development enabled nursing faculty to observe and analyze the learning experience, student performance, and progress.

Students learn best in an environment as active participants and where adult learning principles are employed by nursing faculty. Nursing students needed to leave learning environments prepared for work environments of complex patient situations and knowledge of technology information utilized in health care environments. This preparation required nursing program curricula to integrate objectives for CT, and to have clear and specific guidelines for evaluating CT.

Recommendation for Practical Applications of CT

Nursing faculty must become aware and knowledgeable of current technological use in nursing education to meet the needs of current student populations and how information technology was being used in the health care environment. Simulation was a major teaching strategy for CT development and transfer into nursing practice. Simulation was costly in terms of equipment, faculty, and student educational preparation and time-consuming if nursing faculty created their own scenarios. Yet, the current

thinking about simulation integrated with multiple teaching strategies was effective for creating clinical situations.

In the classroom, nursing faculty using multiple teaching strategies can effectively enable students to learn how to think critically, in order to handle unfamiliar patient situations by fostering positive outcomes based on *what if* or *what is happening here* type questions. This study of nursing faculty perceptions of CT did not generate many responses on outcomes. Most responses about effective outcomes of CT were related to passing NCLEX-type multiple choice examination questions and passing the NCLEX, which is an important goal of nursing education. Nursing faculty might need to incorporate student evaluation of their learning CT and how student perceptions and satisfaction on how they were developing CT. These elements would help in developing student confidence, which is the assurance of one's reasoning ability, which is an outcome that is transferable into nursing practice (Scheffer & Rubenfeld, 2000).

Recommendation for Future Research of CT

The need for faculty development to improve nursing faculty competency in teaching nursing students and developing CT. Research studies showing how nursing faculty perceive themselves teaching CT would enhance student learning and transference to nursing practice. Research studies about nursing faculty and CT would help nursing faculty to develop a formal teaching philosophy to facilitate learning environments that conducive to teaching and learning. Research on utilizing multiple teaching strategies that promote CT development would add to evidence-based practice on instruction. This study's findings recognized that not one strategy but the integration of multiple teaching strategies produced positive outcomes.

Existing literature revealed few studies on faculty-student relationships and how the relationships influenced teaching and learning. More studies in this area could reveal how faculty and students build relationships to influence positive outcomes during the academic programs and into nursing practice. Nursing faculty modeling of CT affective attributes and cognitive skills enhanced student CT development and positive outcomes.

The findings from this study and existing studies indicated that there no clear definition of CT in nursing education and practice. Research studies are needful that encourage nursing faculty to come together and form definitions that clearly define CT in the nursing profession. In forming definitions for CT and incorporating the definition, teaching strategies and activities, and evaluation of CT, nurse educators can collaborate with other nursing programs to share definitions and meanings of CT. Research studies about this shared responsibility of forming definitions of CT lead to best practices for teaching CT in nursing education.

Summary

This study on the perception of nursing faculty on teaching CT was conducted to increase the understanding of faculty awareness of creating environments that foster and nurture CT development. Traditional and multiple teaching strategies were required for CT development. The findings indicate the use of current technological instructional methods such as simulation. However, learning was improved by the combining effect of teaching methods and learning environments. Learning environments that applied adult learning principles, students' life experiences are valued as learning tools, and learning was individualized to meet students' educational goals were important aspects of CT.

The findings from this study allowed nursing faculty to reflect on the teaching and evaluation of CT. The literature reviewed for this study revealed limited research on nursing faculty and their perceptions of teaching CT. Previous studies conducted described how multiple teaching strategies assisted with CT development. Teaching strategies and activities that required students to think and to learn how they and others think develop CT affective attributes and cognitive skills. Nursing students who are introduced to instructional methods that produced CT and have nurse educators who modeled CT have greater understanding of the meaning of CT and demonstrated those characteristics in clinical experiences.

Nursing faculty would benefit from understanding how other faculty members defined and incorporated CT in their classrooms and clinical experiences. This study offered insight on how nursing faculty used traditional teaching methods and incorporated current technology to create learning environments associated with CT. The findings show that nursing faculty are ready to move into the student-centered environment, not just in the theoretical aspects but also in nursing practice. Essential to educating students is that nursing faculty have the support necessary to breakthrough barriers that exist in teaching CT. Significant to this study is that nursing faculty members buy in on the need for nursing students to develop CT. The nursing faculty buy-in includes clear learning objectives and outcomes, evidence-based practice teaching strategies, and clear evaluation methods that promoted CT development. This study's findings indicate that nursing faculty tend to create learning environments that support Knowles's (1984) adult learning model. Knowles's adult learning model is a positive model for student-centered environments where students' life experiences, maturity

levels, and educational goals play a critical role in developing CT and later in nursing practice. Critical thinking is of utmost importance in the current health care environment. CT affective attributes and cognitive skills developed in nursing education programs and transferred into nursing practice ensure that the needs are met for patients with diverse and complex health problems. CT development facilitates positive outcomes for nursing management of these health problems, and results in positive growth and development for nurses in clinical practice.

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APPENDIX A. NURSING FACULTY PERCEPTIONS OF TEACHING CT SURVEY

The purpose of this survey is to identify nursing faculty perceptions of teaching strategies for developing CT in nursing students. The current nursing education mandate from the National League for Nursing (2003) is that nursing faculty perform research regarding the teaching strategies that promote the development of CT for nursing students. Your input from this survey will assist nurse educators in creating learning environments that support CT development in nursing students. The survey will assist nurse educators to become aware of their performance in teaching CT to nursing students in classroom and clinical sites. Follow-up telephone interview will allow nurse educators to further explore and describe personal experiences teaching CT to nursing students. The further exploration will provide data on actual usage and application of teaching strategies and of outcomes associated with application and usage.

The definition for the survey is based on the consensual definition of Scheffer and Rubenfeld's Delphi study that contains many of the attributes that were found in the definition of the nursing process:

> "CT in nursing is an essential component of professional accountability and quality nursing care. Critical thinkers in nursing exhibit these habits of the mind: confidence, contextual perspective, creativity, flexibility, inquisitiveness intellectual integrity, intuition, open-mindedness, perseverance, and reflection. Critical thinkers in nursing practice the cognitive skills of analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting and transforming knowledge" (2000, p. 357).

The survey will take approximately 20 minutes and participation is voluntary. I appreciate your time and effort in assisting with the research study.

Section I

1) Please check the teaching strategies that you use in your **classroom** that you think were most effective for developing CT in nursing students.

□Case Scenario

□ Case Study

□ Computer-Assisted Instruction

□ Concept Maps

□ Debate

□ Discussion

□ Games

□ Journaling

□ Lecture

□ Nursing care plans

□ Questioning

□ Research critique

□ Essays □ Role playing

□I don't teach in classroom. Please proceed to Question 2.

Other _____

2) Please check the teaching strategies that you use to develop CT skills in the **clinical experience** of nursing students.

□ Case Scenario □Journaling

□Questioning □Role playing

□Concept Maps □Computer-Assisted Instruction

□Case Study □Games

□Nursing care plans □Discussion

□Research critique □Debate

Other _____

3) Please check the top five affective attributes related to CT that you perceive were most important to effective nursing practice.

□ Confidence □ Intellectual Integrity

□ Contextual perspective □ Intuition

□ Creativity □ Open-mindedness

□ Flexibility □ Perseverance

□ Inquisitiveness □ Reflection

4) Please check the top five cognitive skills related to CT that you perceive were most important to effective nursing practice.

□ Analyzing

□ Applying standards

□ Discriminating ability

□ Information seeking

□ Logical reasoning

□ Predicting

□Transforming knowledge

5) Would you like to offer any additional thoughts about the relationship of CT to nursing education?

_____

_____

_____

6) Please rank order the following four outcomes of teaching CT from 1 to 4 where 1 is the value you consider most important.

_____ Application of knowledge

_____ Content knowledge

_____Patient outcomes

_____Relationship-centered care

7) Had you ever had formal instruction on CT?

_____Yes

_____No

If yes, please explain_____

8) Based on your top five selections for most affective attributes in Question #3, what teaching activities would you use to stimulate behaviors and actions in your nursing students that you can measure satisfactory development of CT?

9) Describe the teaching strategies you use in the classroom and or clinical setting that would promote the development of your five top cognitive skills in Question #4 for CT development?

10) Given the teaching strategies, creating activities and assignments for CT, what do you were the most important measurements for satisfactory progress in CT?

Section II: Demographics

This section seeks to obtain information about you, the participant. Please check the response that best describes each of the elements. Please provide more specific information as appropriate.

11) Highest Educational Level Attained:

□PhD in Nursing

□DNSc/DNS

□ND/DNP

□EdD

□PhD in a related field—state field_____

Master's Degree Attained

□Master of science in nursing

□Master's in a related field—state field _____

12) Number of years as a nurse—please specify: _____years

13) Please check the courses you currently teach or had taught in the past:

□Advanced Pathophysiology

□Advanced Health Assessment

□ Pathophysiology (Undergraduate)

□ Health Assessment (Undergraduate)

□Management of Acute and Critical Care Illnesses

□Health Promotion and Disease Prevention

□Management of Chronic Illnesses

□Evidence-Based Practice

□Other Courses—please specify_____

□Please indicate areas of clinical instruction: _____

_____

14) Please check the number of years of experience you had in nursing education.

□ 1–5 years

□ 6–10 years

□ 11–15 years

□ 16–20 years

□ >21 years (please specify the number of years) _____

15) Teaching level: Please check the appropriate response.

□ADN □MSN

□BSN □Doctoral

16) Gender

□Female □Male

□ Please check the box if you were willing to be interviewed by phone for approximately 20 minutes to further explore your thoughts and feelings about teaching CT to nursing students. If you accept the invitation to be interviewed, you may notify the researcher by mail using the self-addressed envelope, by phone, or e-mail ([redacted]). All personal identifying data will be destroyed following the dissertation process.

Please return all survey responses to the researcher at surverymonkey.com or via the self-addressed envelope. Please complete the survey and return it no later than February 28, 2009. All participants who had not returned the survey within 1 week of initial contact will be sent an e-mail reminder at 5–7 day intervals two additional times.

END OF SURVEY

Thank you for your assistance.

Note. From *NP Faculty Views on Critical Thinking* (pp. 171), by E. Kotthoff-Burrell, 2007, unpublished doctoral dissertation, University of Denver, Colorado. Copyright 2007 by Ernestine Kotthoff-Burrell. Adapted with permission.

APPENDIX B. TELEPHONE INTERVIEW QUESTIONS

1. In what ways do you implement and apply CT teaching strategies to the subjects you teach?

2. Could you describe the effectiveness of the teaching strategies you chose in the survey? (Follow-up: Ask respondent in turn about each strategy they checked.)

3. In what ways, if at all, do you discuss CT with your students?

4. What do you see as the role and importance of CT in relation to the teaching of content and nursing skills?

5. What other comments do you had, if any, about the teaching of CT in nursing classrooms and clinicals?