Nurse Educators' Critical Thinking: A Mixed Methods Exploration

by

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Abstract

Critical thinking is an important indicator of student learning and is an essential outcome of baccalaureate nursing education. The role of nurse educators in the development of students' critical thinking has been overlooked despite the importance of their actions to facilitate critical thinking in nursing education. How nurse educators reveal their critical thinking in practice is also unknown. The purpose of this study was to explore nurse educators' critical thinking in clinical practice. I utilized a mixed methods triangulated design with a grounded theory approach for the qualitative phase of the research. I employed three data collection approaches including critical thinking self-assessment tools (CCTST-California Critical Thinking Skills Test and CCTDI-California Critical Thinking Disposition Inventory), participant observation, and interviews. As part of my exploration, I completed an integrative review of nursing research examining nurse educators' critical thinking. The integrative review I completed highlighted issues such as the continued lack of a consensus definition of critical thinking and the limited presence of conceptual models to guide the use of critical thinking in nursing education. As well, the integrative review illuminated the emergence of some beginning patterns in the measurement of nurse educators' critical thinking. The findings from my mixed methods study found that nurse educator participants had moderately strong critical thinking skills along with a positive inclination to think critically, as measured by the CCTST and CCTDI. These results are similar to other findings evident from the limited studies completed to date. My study captured one interpretation of how nurse educators revealed their critical thinking

in clinical practice. Based on my interpretation, I created a conceptual model depicting how nurse educators' show their critical thinking in the clinical setting. The important categories of this model include: a) fostering the student-educator relationship; b) role modeling critical thinking; c) mobilizing and operationalizing resources; as well as d) balancing factors that impact nurse educators' critical thinking. My study's findings inform what is known about nurse educators' critical thinking and how it can be revealed in nurse educators' teaching practice. Given my findings, I offer recommendations for future nursing education practice and research.

Preface

This thesis is an original work by Christy L. Raymond-Seniuk. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Health Research Ethics Board (HREB); Project Title: Nurse Educators' Critical Thinking: A Mixed Methods Exploration; study ID: PRO00020243 dated March, 3, 2011. Amended approval was received July 4, 2011 reflecting an altered recruitment strategy. The amended study ID was PRO00020243_AME2.

Christy L. Raymond-Seniuk conceptualized the study explicated in this thesis and completed the research including developing the research questions, designing the methods, recruiting the participants, collecting the data, and analyzing the data. Dr. Joanne Profetto-McGrath (supervisor), oversaw the formation of the study and assisted with the approaches to data analysis and dissemination of the results. All of the articles contained in this thesis were the initial work of Christy L. Raymond-Seniuk, with the supervisory committee making substantial contributions to the editing and organization of the identified articles. No part of this thesis has been previously published.

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I would also like to acknowledge the participants who made this research possible. Your generous sharing of time and perspective has shone a light on an important aspect of how we facilitate learning in nursing education. I thank each of you for the enlightenment I have gained from our discussions.

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Chapter One

Introduction and Background

Critical thinking is a necessary and highly desirable attribute in nursing (Mundy & Denham, 2008; Twibell, Ryan, & Hermiz, 2005). Nurses need critical thinking to ensure their practice is astute, competent, and responsive to the constantly changing contexts in which they work (Banning, 2006; Martin, 2002). As well, developing critical thinking skills is one of nursing education's top priorities, an important indicator of students' learning, and an essential outcome of baccalaureate nursing education (Valiga, 2003). Ironside (2005) added that thinking in context is important to foster students' understanding of knowledge beyond memorization, thereby facilitating the application of theory to practice. Nursing students' critical thinking has been widely studied by researchers as an educational outcome in attempts to demonstrate course and program effectiveness. To date, researchers have not uncovered a convincing correlation between current nursing education practices and the development of critical thinking (Adams, 1999; Kintgen-Andrews, 1999). More specifically, the questionable link between nursing education and students' critical thinking is evidenced by inconclusive and inconsistent measurement findings (Beckie, Lowry, & Barnett, 2001; Howell Adams, Stover, & Whitlow, 1996; Kawashima & Petrini, 2004; May, Edell, Butell, Doughty, & Langford, 1999; Noles, Nickitas, Keida, & Neville, 2005; Shirrell, 2008; Stewart, & Demsey, 2005).

Many scholars and educators have overlooked the role of nurse educators in the development of students' critical thinking despite the importance of critical

thinking in nursing education (Mundy & Denham, 2008). How nurse educators mobilize their own critical thinking to enhance learning interactions with students in clinical contexts is also unknown. Despite the importance for all nurses, including nurse educators to demonstrate critical thinking in practice, there are issues that impact its achievement and measurement. Some scholars and educators find it difficult to understand the role of nurse educators' critical thinking in the absence of a consensus definition (Mundy & Denham, 2008; Tanner, 2005). Limited research exploring the mobilization of nurse educators' critical thinking skills and dispositions has left many questions unanswered (Raymond & Profetto-McGrath, 2005). The overall effect of nursing education on the development of students' critical thinking is not well informed by published literature (Brunt, 2005a; Ferguson & Day, 2005). Given the gaps in knowledge related to nurse educators' critical thinking and its impact on the development of students' critical thinking, further study is warranted.

To understand how nurse educators defined critical thinking, I explored common critical thinking definitions, and then more specifically, I examined those definitions used in my study. Following the discussion about critical thinking definitions, I present the questions that guided this study.

Critical Thinking Definitions

Critical thinking is discussed in nursing and non-nursing literature. I found similarities and differences among the several published definitions. The most cited non-nursing definitions evident in published literature are those by Facione (1990), Brookfield (1987), and Paul (1992). The most commonly cited

nursing-specific critical thinking definitions are offered by Scheffer and Rubenfeld (2000) and Alfaro-Lefevre (2009).

Facione's (1990) definition emerged from his work with the American Philosophical Association (APA), which led to the creation of the Delphi consensus statement. This definition includes both skills and dispositions, and served as the basis for the development of the California Critical Thinking Skills Test (CCTST) and the California Critical Thinking Disposition Inventory (CCTDI). I used both in my research study as a measure of nurse educators' critical thinking. This definition states:

> We understand critical thinking to be purposeful, self-regulatory judgment that 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… The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit (p. 4).

Brookfield (1987) is also cited for his definition and description of critical thinking, which includes: a) identifying and challenging assumptions; b) challenging the importance of context; c) imagining and exploring alternatives;

and d) engaging in reflective skepticism. These components illustrate Brookfield's view of critical thinking as a process with both emotive and rational aspects. Further, Brookfield identified that imaging and exploring alternatives to problems and situations initiates reflective skepticism. Similar to Brookfield, Dewey (1933) asserted that reflection resulted from a disbelief in a specific thought. The dissonance in one's thinking then triggers a careful consideration of one's assumptions in order to re-establish beliefs about an idea of thought. Both Brookfield and Dewey emphasized the importance of a trigger to critical thinking, as well as the integral role of reflection in the process.

Paul (1992) provides another critical thinking definition frequently cited in the literature, which states:

> Critical thinking is self-disciplined, self-directed thinking that exemplifies the perfections of thinking appropriate to a particular mode or domain of thought. It comes in two forms. If disciplined to serve the interests of a particular individual or group, to the exclusion of other relevant persons and groups, it is sophistic or weak-sense critical thinking. If disciplined to take into account the interests of diverse persons or groups, it is fair-minded or strong-sense critical thinking (p. 10).

Scholars have frequently cited Paul's definition in education-based literature. This definition emphasizes an important leveling of critical thinking (strong versus weak sense) not seen in other definitions.

Scheffer and Rubenfeld (2000) also used a Delphi technique to generate a nursing based definition of critical thinking. Their definition situates critical thinking as an integral part of nursing practice and asserts that both skills and dispositions are required by nurses to think critically. Scheffer and Rubenfeld define critical thinking in nursing as:

> ..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).

This definition is not the only one available in nursing. Alfaro-LeFevre also created a definition of critical thinking that encompasses some similar elements as Scheffer and Rubenfeld's, while offering a comprehensive description of elements comprising critical thinking from a nursing perspective. Alfaro-LeFevre (2009) stated that:

> Critical thinking and clinical judgment in nursing is: a) purposeful, informed, outcome-focused (results oriented) thinking, b) carefully identifies key problems, issues and risks, c) is based on principles of nursing process, problem solving, and the scientific method, d) applies logic, intuition, and creativity, e) is driven by patient, family, and community needs, f) calls for strategies that make the most of the human

> potential and, g) requires constant reevaluating self-correcting, and striving to improve (p. 7).

It is evident that Alfaro-Lefevre inferred a strong link between critical thinking and clinical judgment, which is not included in other definitions.

Given the various definitions and perspectives, it is apparent that critical thinking has not been consistently defined (Mundy & Denham, 2008; Riddell, 2007), and as Walsh and Seldomridge (2006) believed, it is "not one, monolithic thing" (2006, p. 216). The diversity of critical thinking definitions and perspectives is understandable, yet for some it remains problematic (Tanner, 2005). A clear rationale to support the need for, and potential benefits of, one universal definition of critical thinking is not available in the literature.

Upon further examination, I noted that published critical thinking definitions are aligned with either the scientific method including rational or logical thought; or more demonstrative of a feminine conceptualization (Staib, 2003; Walthew, 2004). As defined by Facione (1990), critical thinking is aligned with more rational and logical ways of thinking, including cognitive skills such as inference, evaluation, and analysis. Paul's (1992) definition of critical thinking alluded to more cognitive skills, given his focus on perfections of thought, which included logicalness, accuracy, and precision. In comparison, Scheffer and Rubenfeld (2000) define critical thinking from a nursing perspective, incorporating intuition, creativity, and contextual perspective as important components needed in order to think critically. These more feminine aligned concepts of creativity and intuition are also part of Alfaro-Lefevre's definition

(2009). Gordon (2000) further identified that nurse scholars were less likely to include cognitive activities of interpretation, explanation, and self-regulation as critical thinking skills and found they instead favoured leadership, trustworthiness, and sensitivity. Gordon (2000) also found that nurse scholars were more inclined to include problem solving and the nursing process as important aspects of critical thinking, a specific difference from definitions developed by non-nurse scholars. Paul (1992) provided an additional difference not apparent in other definitions, where he distinguished between weak and strong sense critical thinking.

The abundance of critical thinking definitions and conceptualizations has led to some confusion regarding what critical thinking entails (Riddell, 2007). There are other terms used interchangeably with critical thinking including problem solving, decision-making, clinical reasoning and clinical judgment (Alfaro-Lefevre, 2009; Riddell; Turner, 2005). Yet despite their frequent use, the validity of using surrogate terms as synonyms for critical thinking has not been established (Simpson & Courtney, 2002). The multiple conceptualizations of critical thinking have led to inconsistent use of the term. As the definitions have become increasingly complex, critical thinking has also become more difficult for scholars to measure (Mundy & Denham, 2008). The lack of a clearly identified consensus definition has led to diminishing labels for critical thinking, such as *catch phrase* or *buzz word*. Some authors have called for the abandonment of critical thinking as an acceptable term in place of other terms, such as creative thinking, to identify the role and type of thought process that occurs in nursing

practice (Benner, Sutphen, Leonard, & Day, 2010; Valiga, 2003). Nevertheless, the call to abstain from using the term critical thinking may be premature given the lack of a comprehensive analysis of its many definitions.

Definitions Used in This Study

Critical thinking can be defined in numerous ways; however, contextual influences impact how a definition is operationalized. For the purpose of my study, I chose two definitions of critical thinking. Facione's (1990) definition, based on his work with the American Philosophical Association (APA), was the main definition of critical thinking for this study. His perspective formed the foundation for the creation of the critical thinking assessment tools used in my research study and is one of the more commonly-cited critical thinking definitions in higher education literature.

The second definition I chose for my study is from Scheffer and Rubenfeld (2000); developed using a Delphi technique with nurse scholars. This definition reflects the importance of context and defines critical thinking from a nursing perspective. In addition, the inclusion of intuition, creativity and contextual perspective emphasize the role of critical thinking as "an essential component of professional accountability and quality nursing care" (Scheffer & Rubenfeld, 2000, p 357). Both definitions were generated by experts in the field who were interested in identifying specific skills and dispositions. My own view of critical thinking encompasses the works of Facione, as well as Scheffer and Rubenfeld (2000). Although I believe that the definition created by Facione is foundational for the measurement of identified critical thinking skills and

dispositions, Scheffer and Rubenfeld's definition includes the important elements of nursing context and language.

In addition to defining critical thinking, I needed to define nursing education and nurse educator in the context of my research study. I defined nursing education as the baccalaureate preparation of nursing students comprised of clinical, classroom, and laboratory related learning experiences. The Canadian Association of Schools of Nursing (CASN, 2011) identified that "Baccalaureate programs provide the foundation for sound clinical reasoning and clinical judgment, critical thinking, and a strong ethical comportment in nursing" (p. 1). The focal context of my study is clinical education, which is led by nurse educators and can occur in a variety of health care settings. I defined nurse educators as registered nurses who teach nursing theory and/or practice in a baccalaureate nursing program. Despite limited literature and the pursuit of understanding what critical thinking entails in nursing education, many questions remain.

Purpose and Research Questions

The purpose of this study is to explore and determine nurse educators' critical thinking in practice. I proposed the following research questions to guide my study:

1. What is the critical thinking of nurse educators?
2. How is critical thinking revealed by nurse educators in the clinical setting?

   a. What indicators of nurse educators' critical thinking are observable in the practice setting?
   b. How do nurse educators describe how they reveal critical thinking in the practice setting?

3. What facilitators and barriers impact nurse educators' critical thinking skills and/or dispositions in practice? How so?

The exploration of nurse educators' critical thinking is significant to the broader health care context because of the influence nurse educators have in educating future nurses. Nurse educators spend a significant amount of time with students and are expected to facilitate students' critical thinking as they become effective practitioners. Thus, nurse educators use effective teaching practices to educate future nurses who positively impact patient outcomes. Dickerson (2005) stated that "learning provides motivation for continued professional growth and can lead to improved quality of care" (p. 68). Fesler-Birch (2005) added that nursing research is needed to link critical thinking dispositions to patient outcomes, and to demonstrate the importance of thinking critically in the clinical setting. Culmination of the research and the perspectives I put forth in the following paper will add to the growing body of evidence, bringing into focus the scope of critical thinking in nursing education.

Researcher's Assumptions and Perspectives

It is important to situate myself as the researcher within the context of my research topic in order to disclose my perspective and the lens from which my research is completed. My relationship with the research participants was

influenced by my assumptions and philosophical perspectives regarding my research topic.

My assumptions about critical thinking for this study are:

1. Critical thinking is integral to nursing and is an important goal of higher education.
2. Critical thinking is defined differently in a variety of contexts and its operationalization depends on the environment where it is being utilized or referenced.
3. Critical thinking is complex and includes several components.
4. Critical thinking encompasses both skills and dispositions.
5. Critical thinking is both a process and an outcome.
6. Critical thinking can be taught and/or facilitated in teaching and learning interactions in a variety of settings.
7. Critical thinking can be assessed and measured.

As a researcher and a nurse educator, I have reflected on my critical thinking skills and the related dispositions or characteristics I possess and demonstrate. I have also examined how my "learning autobiography" (Brookfield, 1995) or past experiences have shaped how I create learning experiences for students in the clinical setting. When reflecting on the impact my critical thinking has on students' critical thinking, I believe my curiosity is fueled by a desire to improve my teaching. My desire to be an authentic and effective educator has strengthened my need to know more about myself and how nurse educators' critical thinking is revealed in practice. I openly acknowledge that my

philosophical lens is colored by a combination of pragmatism and social constructivism. I discuss each below, in an effort to illuminate my perspective as a researcher.

Pragmatism has roots deep into the 17th century when it was first conceived by Charles Sanders Peirce and later built upon by philosophers such as John Dewey and Richard Rorty. From my moderate standpoint, pragmatism encompasses more than doing what works or focusing on truth or falsity. Pragmatism rejects the either-or propensity of choosing between philosophies and focuses on the necessary element of philosophizing and questioning perspectives for the sake of understanding consequences. As such, pragmatism is more aligned with the process of exploring and contemplating all possible explanations when many answers to an inquiry may exist.

The goals of pragmatism include understanding and developing new techniques for problem solving, which are foundational to student learning in clinical settings (Meleis, 2007). Pragmatism is concerned with contemplating theory for the purpose of questioning and application/action. Pragmatism is relevant to clinical nursing education based on the mutual reliance of both on a pluralistic appreciation of the many nursing theories and philosophies. Pragmatism supports a critical link between theory and practice, which is also required in clinical nursing education to apply knowledge to the very place from which knowledge is derived (Kim & Kollak, 2006). Pragmatism aligns well with an eclectic approach to analyzing nursing issues in the clinical setting, where various contextual factors often affect the decisions that are made. Morgan (2007)

believed that pragmatism allowed for the movement between inductive and deductive reasoning, which facilitates both predictive and evaluative modes of thinking. Situating pragmatism in clinical practice fosters broad understanding and contextual problem solving which leads one to imagine possibilities and leads us "away from static abstractions" (Hartrick Doane & Varcoe, 2005, p. 83). Pragmatists are not concerned with worldviews as much as they are with the consequences of holding worldviews and being in the "living present" (Hartrick Doane & Varcoe, p. 83).

Another philosophical perspective I hold is that of social constructivism. Overall, constructivism is concerned with developing one's knowledge to further human learning. Based on the work of Jean Piaget and extending to the learning theories developed by Malcolm Knowles and Jack Mezirow, learners incorporate new understanding based on previous experiences which are paramount in learning (Vandeveer, 2009). The objective of inquiry from a constructivist perspective is to comprehend the social conditions associated with accepting a certain viewpoint. Language is integral to understanding, negotiating, and communicating meaning. Learners are at the centre of constructivism, where social interactions are mediated by the educator as facilitator (Haw, 2006). Therefore, from a social constructivist perspective, it is important to use one's experiences to develop higher level thinking skills (Broussard, McEwen, & Wills, 2007). My exploration of nurse educators' critical thinking in a learning environment is compatible with my constructivist affiliation.

Ontology is defined as the "inquiry into, or theory of, being *qua* being" (Mautner, 2005, p. 442). Stemming from the two philosophical perspectives discussed above, my ontological stance supports the existence of multiple realities that are constructed through interactions with others, thus, the act of being becomes constructed through a socially linked existence. I also believe there is no one single truth but numerous perspectives that are molded by factors that determine how such truths are socially assembled. Hence, I am a relativist who understands reality as a cognitive construction that is intricately multifaceted.

Epistemology is the theory of knowledge (Mautner, 2005), and the study of how knowing and knowledge come to be. Epistemologically, I am a subjectivist who believes there are multiple ways of coming to know something. I believe evidence takes many forms and is enlightened by both scientific and interpretive inquiries, demonstrating my pluralistic acceptance of multiple forms of knowledge. Knowledge can also be derived through social interactions and mediation where researchers and participants are interlinked (Lincoln & Guba, 1985). In this sense, I believe meaning is negotiated and affected by social and philosophical forces.

Both ontologically and epistemologically, pragmatism and social constructivism fit well with the exploration of nurse educators' critical thinking. The multiple perspectives and definitions of critical thinking found in the literature also align with the pluralistic yet pragmatic philosophical lens that frames my research study. The interactive nature of clinical practice and the evolving learning environment that forms the context for this study are fertile

ground for pragmatic and constructivist inquiry. My use of both quantitative and qualitative research approaches fosters a pluralistic appreciation of my perspective on critical thinking.

Chapter Two

Methodology

Research Design: Mixed Methods

I chose a single phase triangulation mixed methods research design for this study, utilizing quantitative and qualitative data collection methods. The design, outlined by Creswell and Plano Clark (2007), is illustrated in Appendix A. Critical thinking is a multifaceted concept therefore I chose a mixed methods study design to capture the complexity relevant to the way nurse educators' reveal their critical thinking in practice. I believe that studying critical thinking from multiple perspectives (i.e., qualitative and quantitative lenses) "strengthens the power of our claims to understand it" (Charmaz, 2006, p. 983).

Creswell and Plano Clark (2007) highlighted the efficiency of concurrent data collection when using a triangulation mixed methods design. I chose the design so that, as a novice researcher, I could utilize a less complex yet robust mixed methods design to study nurse educators' critical thinking. The triangulation of data collection methods allowed me to combine research approaches in order to "obtain different but complementary data on the same topic" (Morse, 1991, p. 122). When two research traditions can coexist within the same study then a problematic binary is avoided (Giddings, 2006). In my study, triangulation consists of concurrent data gathering using a demographic survey, two critical thinking self-assessment tools, participant observation, and semi-structured interviews.

Setting. The setting I used to complete my study included acute care units in larger hospital facilities used by a Western Canadian educational institution offering baccalaureate level nursing practice courses. I chose acute care to ensure a consistent setting that would allow for comparisons between participant results. In addition, I chose acute care settings instead of community-based settings due to a larger number of these placements, and the potential of multiple interactions during each shift, made possible by the educator being present in one setting for the duration of each shift. The choice of a large baccalaureate nursing program offered a population of potentially interested educators as well as an increased opportunity to provide participant anonymity.

Sample, sampling strategy, and recruitment. For this study I used a convenience sampling method and invited interested nurse educators from a large Western Canadian baccalaureate nursing program to participate. I asked participants to complete both the quantitative and qualitative data gathering aspects of the study. All nurse educators teaching in the targeted nursing courses initially received personalized invitations to participate. Once the initial invite for my study was sent, my recruitment efforts lasted 8 months. The inclusion criteria I set for this study included having an assigned workload teaching selected acute care clinical courses in the chosen nursing program as well as having a minimum of one term clinical teaching experience. I asked willing participants who met the inclusion criteria to contact me via email. When I was contacted by potential participants, I began the initial clinical setting permission processes. The final number of educators I sought to complete the study depended on qualitative data

saturation. Although I only had five nurse educators comprising the final sample, I did reach saturation with the data obtained.

Ethical considerations. For this study I sought and received ethics approvals from the Human Research Ethics Board (HREB) at the University of Alberta. Prior to any data collection, I received general site administrative approvals from the nursing program and the main health boards associated with the clinical setting(s) where the nurse educators would be teaching during data collection. I also obtained individual unit approvals from each unit manager prior to completing any observation of nurse educator participants and their assigned student group. Appendices B and C include the information sheet and consent form provided to nurse educators and students outlining any risks, benefits, voluntary participation, and the required time commitment associated with participation in my study. Nurse educator participants did not receive compensation for participating in the study however, I offered each participant a gift card for coffee as a thank you. I kept all participants' identities confidential throughout the research and in any discussion of findings.

Further explanation is needed pertaining to the ethical considerations of using participant observation in my study. I obtained consent for involvement in this study from participating nurse educators and their student nurses. I also sought additional consent from nurses and unit staff at the start of every shift on units where I conducted observations. If any staff members' or students' words or mannerisms were recorded in field notes, I obtained further written permission from those individuals. I also posted general signage on observation units

indicating observational research was occurring with the nurse educators and students in the area. Those not willing to be part of the observations in any way were able to identify themselves to me and any part of their professional or care interactions were not observed or recorded. I did not complete or include any observations of patients as part of my research.

Data Collection

I gathered data for this study using several methods. I created a demographic survey to collect important details about each nursed educator, as well as asked participants to complete the California Critical Thinking Skills Test (CCTST), the California Critical Thinking Disposition Inventory (CCTDI), participant observation in practice settings, and semi-structured interviews.

Demographic survey. I designed a one-page demographic survey (Appendix E) to gather participant information such as age, years of teaching experience, years of nursing experience, highest degree obtained and completion of any education or development experiences related to critical thinking. Due to the almost six month time period over which the study was completed, I asked participants to fill out a demographic survey at the start and at the end of the study to verify any changes and to ensure I had the most current information when I analyzed the data.

Instruments. Participants completed both the California Critical Thinking Skills Test (CCTST) and the California Critical Thinking Disposition Inventory (CCTDI) which was available online through the Insight Assessment website (www.insightassessment.com). Participants completed the online

assessments prior to the participant observation and interview phases of the study. The CCTST is a multiple choice assessment using generic situations to explore identified critical thinking skills (Facione & Facione, 1994) and takes approximately 45 minutes to complete. Both the total and subscale scores are reported on a 100 point scale. The CCTST yields seven subscale scores as well as a total test score. The seven subscales of the CCTST include: analysis, evaluation, inference, interpretation, explanation, deductive reasoning, and inductive reasoning (Facione & Facione, 1994; Insight Assessment, 2013a; Profetto-McGrath, 2003; Raymond, 2003).

The CCTDI has 75 generic statements with a 6-point Likert scale and takes approximately 20 minutes to complete (Facione, Facione & Sanchez, 1994; Insight Assessment, 2013b). Each statement corresponds to a subscale or disposition of truth seeking open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and maturity. The scores can range from 5 to 60 for each subscale for a total maximum test score value of 420. The final score represents the strength of the participant's disposition to think critically. A score of 350 or higher represents a strong disposition whereas a score of 280 to 349 represents a positive inclination to think critical thinking, and scores below 280 indicate a weak disposition to think critically (Facione, Facione & Sanchez, 1994; Profetto-McGrath, 2003; Raymond 2003). The CCTST and CCTDI scores were calculated online by Insight Assessment. To ensure I was not biased by the results while collecting data, I reviewed the CCTST and CCTDI results after the observation and interviews were completed with each participant. Reliability and

validity information for the CCTST and CCTDI are discussed further in the trustworthiness section. Further information about the CCTST and CCTDI, as well as sample questions, can be found online (insightassessment.com).

Participant observation. Participant observation includes studying both the setting and human activities (Angrosino & Rosenberg, 2011). In my study, I observed nurse educators to gain in-depth understanding of their critical thinking. By being part of their experience (Charmaz, 2006), I used participant observation to record how nurse educators revealed their critical thinking in practice. Researchers have deemed this method of data collection as integral to grounded theory and one of the most important approaches to gathering data in nursing research (Moore & Savage, 2002; Parahoo, 1997). I used non-covert unstructured observations of nurse educators to focus on their behaviours, characteristics, verbal and nonverbal communication, and general activities, as well as environmental conditions (Loiselle, Profetto-McGrath, Polit, & Beck, 2010). My role as researcher was observer as participant with the primary focus being observing. Gold (1958) and Johnson (1992) described the observer as participant role as one that maintains objectivity and does not get too involved in the day to day experiences and tasks of the observed. I participated in discussions with the participants and assisted with some non-care related activities (e.g., obtaining linen from the supply cart for the instructor and student when they were in a patient's room) to build trust with the nurse educator participants. Angrosino and Rosenberg (2011) observed that while using observations as a research tool there is a shift from maintaining objectivity to a stance of collaboration with

participants in the creation of research data. It was important for me to balance objectivity with establishing a meaningful rapport with each educator participant. The observer portion of my role as researcher allowed me to withdraw from the activities and context as needed to record detailed field notes (Robertson, 1982). This process of taking a break from data gathering allowed me to record important observations while the information was fresh and to minimize fatigue, given the intensity of environmental stimulus that was present on each acute care unit.

The primary focus of my study observations was on how nurse educators revealed critical thinking through interactions with students, unit staff, and other educators in the clinical setting. Patients' and/or students' behaviours were not the focus of my data collection activities, nor did I observe any patient care while I was observing nurse educators. I did not focus on student performance or engage in conversations related to student evaluation.

The specific type of observation I used was non-covert with full disclosure of the purpose and focus of the study. I posted information about the study for all staff, patients, families and all collaborative health professionals to read. I gave all nurse educator participants and their students copies of the study information sheet and a copy of their signed consent form. I reviewed the right to withdraw from any of the observations at any time with the educators and their respective student groups. The observation phase for each nurse educator took place over a four day clinical week. Limited literature is available to suggest a definitive time period for effective observation in any nursing education study. One study by

Hsu (2006) observed clinical educators for two days recording characteristics of effectiveness. Hsu's findings were not conclusive that two observation days were sufficient to yield substantial findings therefore I observed each participant for three or four shifts until sufficient data were collected.

Although I planned to observe seven to ten nurse educators, the final number was smaller, the result of less than expected recruits. Nevertheless, I did achieve data saturation based on the data collected from the smaller sample. Observations were recorded as field notes along with analytical dialogue. When documenting the frequency of observations I recorded detailed notes that were completed at approximately one to two hour frequencies, and at the end of each observation day. I did not use structured tools or recording devices.

Interviews. After the observation period of the study, I conducted one initial semi-structured interview with each nurse educator participant. The interviews explored each nurse educators' views on critical thinking such as what facilitated it, what inhibited it, how they felt they demonstrated it, and how they defined it. During the interviews, I also explored and clarified my perceptions about the observations I had made during the shifts. To add depth and breadth to the interview data, I invited participants to take part in a second interview. I added the second interviews to verify responses and to allow each nurse educator participant additional time to reflect on their critical thinking. The interviews I completed were done in person at a location that was private and convenient for each participant. The initial interviews followed a general interview protocol of predetermined questions (Appendix D) and lasted approximately one hour. The

questions asked in the second interview were more participant specific and offered the educators a chance to reflect on a critical thinking definition that was circulated prior to the interview, as well as address how their critical thinking was revealed to students in specific clinical learning interactions. All of the interviews were digitally audio-recorded, transcribed verbatim, and checked for accuracy. I sent synopses of the interviews to each participant to ensure I had captured the essence of our discussions.

Data Analysis and Interpretation

I analyzed data from this study using multiple approaches. I obtained the scores for the CCTST and the CCTDI from Insight Assessment. Individual participant scores were then entered into SPSS version 15.0, from which I calculated descriptive statistics for the sample. Correlational and multivariate statistics were not possible given the small sample size. I compiled the demographic survey data and entered it into SPSS 15.0 to compute descriptive statistics.

Using coding procedures outlined by Charmaz (1995, 2006, 2011) to analyze the qualitative data obtained from the interview transcripts and the observation field notes, I hand-coded, without the aid of a computer program. The coding procedures that I utilized included active line-by-line coding followed by identification of emerging themes. I transformed key themes into categories, which I then applied to sift through the large data set to refine the names assigned to each category. I also used constant comparative analysis throughout the coding process to refine specific details about each category and resultant themes.

Memoing supported the comparative analysis process and provided a medium for recording my thought processes and decisions throughout my analysis. I recorded thoughts and events in a reflective journal, which provided contextual support to better understand emerging themes, as well as to have a check system to limit my potential bias. Based on the categories and themes that emerged from the data, I created a model to depict the theoretical representation of my findings. Glesne (2007) identified the importance of data display in qualitative inquiry.

It was challenging to compare the quantitative and qualitative data in this study due to the different forms of information. I did not transform data in the analysis phase. After the individual analysis of the qualitative and quantitative data, I compared both the quantitative and qualitative data to see if I could identify similar trends or themes. First, I compared the individual results from the CCTST and CCTDI with my observation field notes for each participant with the aim to identify similarities and differences. I also identified any negative cases that supported or negated the emerging themes. Once I developed the qualitative model, I revisited the quantitative data to confirm congruency with the elements in the model. Although I assumed at the start of my study that I would assign equal weighting to each of the qualitative and quantitative data sources, the richness and volume of the qualitative data appeared to strengthen its presence in the analysis.

Trustworthiness. Lincoln and Guba (1985) described trustworthiness of data as the honest representation of a construct and experience in data collected from participants. Trustworthiness is facilitated by the applicability, consistency,

and the neutrality of the data collection methods used. Using a triangulated mixed methods research design, I combined qualitative and quantitative data gathering approaches and made sure the resultant data sets were each true to the paradigm from which they emanated. Therefore, I assessed the quantitative data gathering methods for reliability and validity and the qualitative data gathering methods were assessed for credibility, auditability, and fittingness respectively.

Reliability and validity. The reliability of an instrument is the extent to which it yields similar results over time, identifying the accuracy of how well it measures what it was created to measure (LoBiondo-Wood, Haber, Cameron, & Singh, 2013). The reliability and validity of the CCTST and CCTDI has been established in both nursing and non-nursing studies. The expert consensus statement on critical thinking (Facione, 1990) created from a Delphi process for the American Philosophical Society (APA) supports the validity of both instruments, as does the growing use of the CCTST and CCTDI by many researchers. The reliability of the CCTDI is reported with internal consistency values of 0.71-0.80 for the seven subscales. The overall test tool alpha value has been 0.90 as reported by Insight Assessment (2013b). Using the Kuder-Richardson method, the internal consistency reliability for the version of the CCTST used in this study has been reported as 0.78-0.82. Nursing studies have also confirmed similar reliability values for the CCTST and CCTDI (Shin, Yoo Jung, Shin & Soo Kim, 2006; Stewart & Demsey, 2005; Stockard Spelcic et al. 2001; Suliman, 2006).

The accuracy of the results related to the precision of the measurement describes the validity of the instrument (LoBiondo-Woods, Haber, Cameron, & Singh, 2005). Content validity of the California critical thinking instruments, as previously noted, is underpinned by the APA Delphi report (Facione, 1990), and the growing use of these tools in research (Insight Assessment 2013a, 2013b). The CCTST has established construct validity through this instrument's significant correlations with other measures, which are believed to be inclusive of critical thinking skills and dispositions (Insight Assessment 2013a). To date there is no existing nursing-specific survey measure of critical thinking. Due to the small sample size, I did not gather reliability and validity measurements from the data I obtained in my study.

Credibility, dependability, confirmability, transferability, and authenticity. My use of prolonged engagement and persistent observation with each participant facilitated the credibility of the data in my study (Loiselle, Profetto-McGrath, Polit, & Beck, 2007). I also triangulated the data to ensure participants' experiences were accurately recorded using multiple data collection methods. I used member checks as another tool to increase the credibility of my findings; these were completed with each participant by reviewing the essence of my observations and interpretations. As well, I used a reflective journal to record and understand my thoughts, assumptions and potential biases towards my findings.

I took several actions to increase the dependability of the data produced by my study to ensure the stability of the data. I maintained a data trail using

reflective journaling to capture my pertinent decisions, thoughts, and contextual reflections that occurred during the research process. Method triangulation also offered some dependability to the data. I consulted my doctoral committee members to review my analysis procedures and resultant findings as another method to establish the dependability of my findings.

I fostered the confirmability (or the objectivity) of the findings, by recording my thoughts in a reflective journal from the onset of the study. This supported examining whether I was biased in my procedures or interpretation of the data. Within the journal entries I disclosed and analyzed the challenges I was experiencing during the research process, as well as recorded the procedures for data analysis and interpretation of the emergent themes and results.

In-depth field notes assisted me in facilitating the transferability of the data associated with the observations I completed. I collected data until data saturation was reached, which will facilitate a rich description of my findings for the purpose of dissemination. I will describe the assumptions that shaped my approach to data collection, when I describe the research process. My detailed accounts, including quotations and observations, will also depict the results in a deep and meaningful way, which may allow others to connect with my conclusions.

Authenticity is an important criterion of trustworthiness that allows a range of participants' realities to show through the data. To ensure data was authentic I remained reflexive about my impact on knowledge creation throughout the study, and did so using a reflective journal. My prolonged engagement and

persistent observations of participants ensured I achieved depth to the data. I also double-checked the verbatim transcription of each interview to ensure accuracy.

Feasibility (Difficulties / Challenges). To gain a deeper understanding of how nurse educators revealed their critical thinking in the clinical practice setting I used multiple data gathering approaches. One limitation of my study was the small sample size. Transferability and generalizability may be difficult given the convenience sampling and limited number of nurse educator participants studied. Another limitation of my study is related to the measurement of critical thinking using the California Critical Thinking Assessment Tools (CCTST and CCTDI). These tools are not nursing specific and therefore may not have captured the essence of critical thinking in a nursing context. There have been calls by scholars and researchers in nursing to create a nursing specific critical thinking measurement tool however, none has been developed to date (Brunt 2005a; Feng, Chen, Chen, & Pai, 2010; Riddell, 2007).

Delimitations of this study included pragmatic and logistic aspects that intentionally narrowed the scope of my findings. My recruitment efforts intentionally focused on one baccalaureate nursing program in order to make my study manageable and feasible. I collected data from nurse educators who had some teaching experience, which also limits the applicability and transferability of the results as there are many nurse educators without teaching experience with whom findings may not resonate. Another delimitation of this study was my use of a concurrent triangulation mixed methods design where I sought to uncover multiple levels of critical thinking for each nurse educator. My choice of design

may have offered me a deeper insight into the critical thinking of each participant, however a longitudinal approach and exploration may have better depicted the potentially fluid nature of critical thinking development over time.

Overview of the Dissertation Manuscripts

I have developed four manuscripts to present the output of my research findings. The following is an overview and brief analysis of each manuscript.

In the first manuscript, I reviewed the literature specifically related to nurse educators' critical thinking and reported the findings from an integrative review examining qualitative and quantitative research completed between 2000 and 2012. Many authors have emphasized the importance of critical thinking as a program outcome yet the role of nurse educators' critical thinking in the process of developing students' critical thinking skills has not been fully explored or understood. First, the goal of completing this integrative review was to compile theoretical literature examining critical thinking in nursing education and more specifically related to nurse educators' critical thinking. Second, I wanted to illuminate what research had been completed and published surrounding nurse educators' critical thinking. I gathered, identified, and reviewed ten articles and dissertations. Following the review, I provide recommendations for future research and practice related to fostering our understanding and application of nurse educators' critical thinking in practice.

In the second manuscript, I outline pertinent literature and explore the facilitators, barriers, related teaching strategies, and definitions of critical thinking in nursing education. Based on the literature, I pose the questions that guided my

research study such as, "What is critical thinking of nurse educators?", and I report the main findings from my mixed methods study, including both quantitative and qualitative results. More specifically, I discuss how the research was completed, along with the comparison of different data obtained. This paper highlights the participant scores from the California Critical Thinking Skills Test and Disposition Inventory (CCTST and CCTDI) along with main themes I captured from interview and observation data.

The third manuscript is a detailed report wherein I discuss a conceptual model that I created based on the qualitative data obtained from participants. I examined interview and participant observation in-depth to explore how nurse educators reveal their critical thinking when engaged in learning interactions with students. I examine main themes along with examples of supportive behaviours and participant quotations. I also provide recommendations for further research and practice.

In the fourth manuscript, I present issues related to recruitment and retention in nursing education research. I review the limited literature available related to this topic and analyzed the challenges and lessons learned from my study. More specifically, in this paper I review what is known about completing and reporting effective research in nursing education, as well as what remains unknown in this area. I suggest possible reasons and recourses we need to consider when completing research to advance the science of nursing education using nurse educator populations.

The collection of manuscripts I present adds to the knowledge related to nurse educators' critical thinking and its integral role in nursing education. By openly discussing the challenges I faced in completing this study, I am confident others can learn, as I have, from this scholarly endeavor.

Chapter Three

Paper One: Critical Thinking in Nursing Education and Nurse Educators' Critical Thinking- An Integrative Review

Critical thinking is a valuable and highly desirable skill in nursing practice (Mundy & Denham, 2008; Twibell, Ryan, & Hermiz, 2005). Nursing graduates require critical thinking skills and dispositions to work effectively in acute, cognitively demanding, and rapidly changing health care systems. As a result, nursing education has emphasized the development of critical thinking for many years. Despite the emphasis on critical thinking, there remains much to be learned about how best to facilitate students' critical thinking. In the literature many questions related to definition, teaching, and measurement of critical thinking in nursing education have been explored with varying results. Given the unanswered questions relevant to the development of students' critical thinking, more exploration is warranted.

A less explored and often overlooked factor is the role and impact of nurse educators' critical thinking skills and dispositions on the development of students' critical thinking. Mangena and Chabeli (2005) stated that "one cannot teach critical thinking if one is not a critical thinker …" (p. 292). Mundy and Denham (2008) concurred with the view that nurse educators are an important variable in nursing educational experiences, warranting further understanding. Yet, despite assertions emphasizing the importance of nurse educators' critical thinking and its impact on the development of students' critical thinking, limited research is available on this topic.

In this paper I provide an overview of research and theoretically based literature exploring critical thinking in nursing education. First, I identify main themes from the literature related to critical thinking in nursing education. I will then address how these themes are linked to the broader discussion of nurse educators' critical thinking. In addition, I present results from an integrative review where I analyzed experimental and non-experimental research studies published between 2000 and 2012, specifically focusing on nurse educators' critical thinking.

Critical Thinking in Nursing Education: Background

There are many research-based articles examining critical thinking in nursing education published since 2000. Definitions of critical thinking, strategies used to foster students' critical thinking, and the measurement of students' critical thinking are recurrent foci in the literature. There is evidence that authors are beginning to shift their attention from defining, teaching, and measuring critical thinking to exploring and understanding the factors and interventions that impact the development of students' critical thinking in nursing education. One such factor, albeit a slow growing area of interest, is nurse educators' critical thinking.

Nursing scholars have found it challenging to define critical thinking (Dickerson, 2005; Mundy & Denham, 2008). Without a consensus definition of critical thinking in nursing education, some believe that the process of developing students' critical thinking has led to meaningless application and further measurement issues (Dickerson; Mundy & Denham). The use of surrogate terms

for critical thinking has added more confusion about its definition. Simpson and Courtney (2002) identified how commonly used surrogate terms (problem-solving, decision-making, and creative thinking) incorporate critical thinking skills but they are not synonymous. Turner (2005) completed a concept analysis and acknowledged the relatively immature nature of the conceptualization of critical thinking. Her findings revealed that the partial maturity of the concept was due to unclear conceptual boundaries, partly because of the overlap with commonly used surrogate terms. In addition, knowledge was identified as the only consistent antecedent to critical thinking in this concept analysis, warranting further clarification of the concept. Beyond conceptualization and definition issues, the many behavioural, metacognitive, and environmental factors that potentially impact critical thinking also add to its complexity.

Teaching strategies used to develop students' critical thinking in nursing education are frequently discussed in the literature. Interactive teaching methods such as questioning, post-conference, critical incident review, and student talk aloud / think aloud, are some examples (Brunt, 2005b; Potgieter, 2012; Twibell, Ryan, & Hermiz, 2005; Walsh & Seldomridge, 2006). Writing strategies such as care plans, reflective journals, concept mapping, and scenario based test questions have also been linked to critical thinking (Brunt; Potgieter; Twibell, Ryan, & Hermiz; Walsh & Seldomridge). Staib (2003) completed a significant literature review exploring strategies to facilitate critical thinking in nursing education and found that teaching methods were mainly used to foster students' reflection, creativity, multiplicity of perspectives, and open-mindedness. However, the

largely theoretical nature of this body of literature has limited research evidence to substantiate its claims or confirm their effectiveness (Brunt). The influence of technology on students' development of critical thinking and the role of culture in fostering alternate perspectives, have also been examined (Spencer, 2008; Walsh & Seldomridge).

Another important topic of discussion in the literature centers on barriers to teaching critical thinking in nursing programs. Mangena and Chabeli (2005) explored obstacles to facilitating students' critical thinking. The most significant barriers they identified were educators' lack of knowledge and educational preparation for the teaching role; use of ineffective teaching and evaluation methods; as well as instructor negativity and resistance to change. Mangena and Chabeli called for nurse educators to demonstrate critical thinking within a student centered learning environment. In another study, Raymond and Profetto-McGrath (2005) found collegial support, effective role models, mentorships, faculty development opportunities, and physical and emotional readiness facilitated nurse educators' critical thinking. Barriers to nurse educators' critical thinking include restrictive environments where educators did not have control over curricular decisions, demanding workloads, and general negativity from colleagues (Raymond & Profetto-McGrath). Additionally, Shell (2001) found that students' characteristics, time constraints, and the need to address specific content were the three top barriers to facilitating students' critical thinking identified by nurse educators. Unlike Shell's study, Raymond and Profetto-McGrath established that educators did not perceive students to be a barrier to

educators' critical thinking. The limited research about facilitators and barriers influencing critical thinking among students, staff nurses and nurse educators warrants further exploration.

Authors continue to struggle with measuring the effectiveness of critical thinking teaching methods in nursing education (Mundy & Denham, 2008). Many scholars have not been convinced that development of critical thinking in nursing is a direct outcome of their experiences in nursing education (Ferguson & Day, 2005). Shell (2001) added that critical thinking, as a program outcome, has not been fully realized. The inconsistent critical thinking assessment scores from numerous studies measuring critical thinking is a major concern (Brunt 2005a). As well, the large variation in measurement tools used over the past 12 years has made the synthesis and comparison of results difficult across studies (Brunt). Two of the more prominently used measurement tools over the latter half of the past 12 years include the California Critical Thinking Skills Test (CCTST) and the California Critical Thinking Disposition Inventory (CCTDI) (Raymond-Seniuk & Profetto- McGrath, 2014). Earlier in the last decade, the Watson Glaser Critical Thinking Assessment and the Cornell Test for Critical Thinking were more commonly used (Brunt).

Scholars call for the creation of a nursing specific critical thinking measurement tool that would incorporate clinically specific questions that would better measure the existence of critical thinking in nursing practice (Walsh & Seldomridge, 2006). Given the predominantly quantitative methods used to date, authors have identified the need to include more qualitative approaches to

studying critical thinking in nursing education (Walsh & Seldomridge). In summary, I identified some issues in the review related to quantitative research studies examining critical thinking in nursing education. These included the exclusion of practicing nurses or nurse educators when examining critical thinking; an emphasis on testing student populations; an unclear conceptualization and operationalization of critical thinking underpinning research studies; and the lack of varied research designs to explore critical thinking in nursing.

Shifting the Focus: The Role of Nurse Educators' Critical Thinking

Some authors allude to the important role of nurse educators in the development of students' critical thinking, most of these articles were published after 2005. However, any reference to nurse educators and their role in the development of students' critical thinking has been minimal and no articles have explored this relationship further than suggesting possible teaching methods educators could use to foster students' critical thinking. How nurse educators' critical thinking could be specifically utilized to develop critical thinking in students is not evident in the literature published to date. Brunt identified that "teaching students about critical thinking is a good start, but it is not enough. They must see the concepts consistently applied by educators…." (2005a, p. 261). Other methods to foster students' critical thinking reported in the literature include role modelling, Socratic questioning, supporting safe learning environments, and creating educator-student relationships that facilitate nurturing dialogues (Brunt, 2005a; Potgieter, 2012; Riddell, 2007). Dickerson (2005) added that nurse educators need to begin to assess their own critical thinking abilities; be

open to questions and challenges; and reflect on their own teaching styles and methods in order to better situate themselves in a facilitative role to assist others to develop their critical thinking. As Walsh and Seldomridge (2006) stated, "faculty are well positioned to role model higher level thinking ... but many do not make best use of this opportunity" (p. 217).

In my opinion, the abundance of literature and research related to the development and measurement of students' critical thinking lacks the needed exploration of possible impacting factors. Researchers' predominant focus on measuring outcomes of critical thinking is understandable given the mandate to ensure the achievement of critical thinking in nursing education. Nevertheless, focusing solely on outcomes may not be logical given the complexity of educational experiences said to develop critical thinking. Intermediary factors contributing to the development of students' critical thinking are plentiful and include how the experiences are facilitated by nurse educators. Researchers have been slow to explore the role of nurse educators who have an important role in the development of graduates who think critically. It follows that we need to understand how nurse educators specifically utilize their own critical thinking in nursing education practice. Although the theoretical literature points to the importance of nurse educators' critical thinking in the education equation, the research-based literature also needs to be considered. To this end, I was interested in undertaking a systematic review. However, due to the small number of articles and the varied methodologies in the described research related to nurse

educators' critical thinking, I completed an integrative review to explore this topic as inclusively as possible (Whittemore & Knafl, 2005).

Integrative Review

To date, there has been limited research measuring the impact of nurse educators' critical thinking on the development of students' critical thinking (Mundy & Denham, 2008). By systematically locating and analyzing available literature, I determined what was already known, what questions needed to be investigated, and the best approaches to do so. Based on their applicability to nursing education, I used the following definitions of critical thinking and critical thinker as reference points to define the context of this review.

- Critical thinking and critical thinkers–Critical thinking 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 (Scheffer & Rubenfeld, 2000, p.357.)
- Nurse Educators – those individuals who teach nursing students in the classroom, laboratory, and / or clinical settings. Other terms used include faculty members, nursing instructors, or tutors. Nurse educators are

employed by academic institutions that offer baccalaureate nursing programs for students studying to become registered nurses.

The two primary objectives that guided this review were:

1. to systematically compile research studies published since 2000 related to the measurement and/or the conceptualization of nurse educators' critical thinking. This may include how nurse educators' critical thinking is defined or measured.
2. to extrapolate and synthesize themes and research data from the studies related to methods, analysis, and results to inform future research directions in this topic area.

The following questions guided this review:

1. During the time period of 2000 to 2012, how have nurse educators' critical thinking skills and/or dispositions been measured or explored as evidenced in nursing education literature?
2. What do studies published between 2000 and 2012 examining nurse educators' and/or students' critical thinking inform us as to how critical thinking manifests in nurse educators? More specifically: what themes are evident from the completed research, what are the significant results, what definitions or frameworks form the conceptual basis for the research completed, and what is the effectiveness of different research designs that have been used?

Methods

Choice of Review Type. I chose an integrative review approach in order to best meet the identified objectives and answer the questions posed. According to Whittemore and Knafl (2005) "systematic and rigorous methods for combining evidence in nursing research are essential for knowledge development" (p. 56). The varied nature of the nursing literature and research regarding nurse educators' critical thinking supports the use of an integrative review format. Theoretical literature is not included in this integrative review owing to the sparse and embedded nature of the theoretical exploration of nurse educators' critical thinking in other articles, as previously outlined in the background section of this paper. Exclusion of the theoretical literature further allowed me to focus on the available research findings to best answer the guiding questions. Whittemore and Knafl outlined that there is an empirical type of integrative review that focuses solely on quantitative studies. However, my review goes beyond the examination of outcomes and relationships between variables. By using an integrative review which includes both qualitative and quantitative research studies, a more comprehensive understanding of the phenomenon is possible.

Search Strategy. The following databases were searched for this review:

1. CINAHL Plus with Full Text
2. Cochrane Database of Systematic Reviews
3. ERIC (1966-present)
4. Health & Psychological Instruments (HAPI)

5. Medline (R) in process and other non-indexed citations and Medline (1950-present)
6. Web of Science
7. SCOPUS

Search terms used for searching each of the above databases were categorized into three main categories: a) descriptors of the thinking process including critical thinking or deep level thinking; b) nursing and nursing educational contexts; and c) the target population of nurse educators/faculty members/nursing instructors. Because of various terms available for each of the three main categories, multiple terms were searched in each database as follows:

1. critical thinking/high* thinking/deep* thinking
2. nursing or nurs* education
3. nurs* educator/faculty member/nursing instructor

Some databases did not require all three categories of search terms and the actual terms varied slightly among databases.

The approaches I used to retrieve literature for this integrative review included database searching as described above, as well as: a) searching websites specifically related or linked to critical thinking and/or nursing education; b) hand searching reference lists of articles to ensure research based articles were not missed; c) hand searching three key nursing education journals (Journal of Nursing Education, Issues and Innovations in Nursing Education, Nurse Educator) to retrieve any additional articles not captured in the database and reference list searches; and d) discussion with local experts.

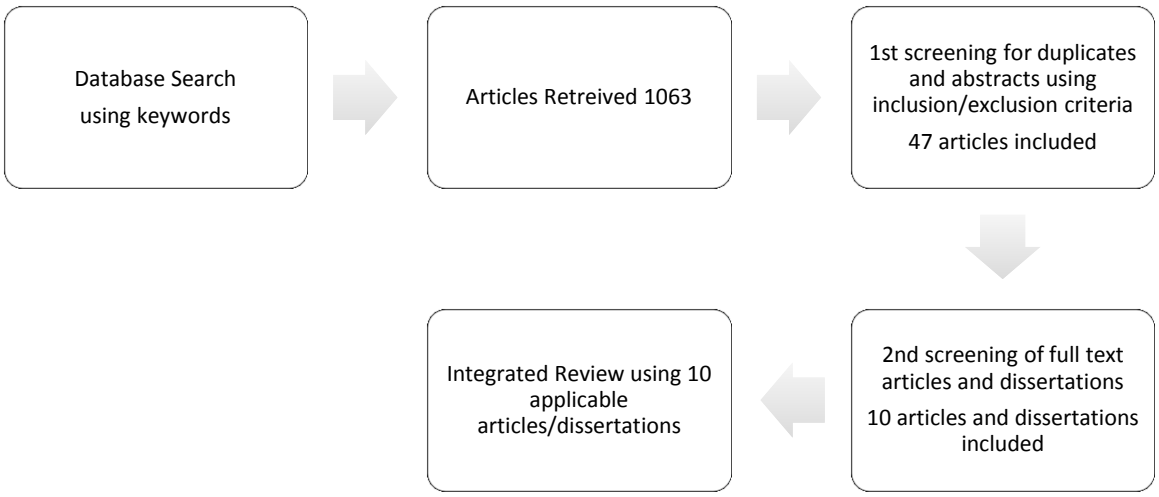
Inclusion and Exclusion Criteria. To be included in this integrative review, articles or dissertations had to be dated 2000 to 2012, be written in the English language or have a detailed English language abstract available, be primary sources of quantitative or qualitative research, and describe the research that was completed to measure or conceptualize academic nurse educators' critical thinking definitions, skills and/or dispositions.

Exclusion criteria for this integrative review included non-English dissertations or articles without a detailed English abstract available, theoretical related literature, research articles that relate to nursing programs not aimed at registered nurse education (e.g., continuing education, vocational nursing), or research not aimed exclusively at understanding nurse educators' critical thinking.

The above inclusion and exclusion criteria were based on the need to locate literature that best answered the questions posed for this review and was published within the time frame most likely to retrieve current yet applicable articles. For example, articles published prior to 2000 would be based on research completed in earlier contexts that may not translate into current practice. The synthesized results from older articles would not be as readily applied to today's context of nursing education and therefore were not part of this review. To reduce publication bias in this review, I included dissertations as potential research sources given the large number available and the trend in this field whereby dissertations are often not published despite their valuable information and findings. Databases and hard copies of journals were searched for articles

and dissertations that met the inclusion criteria. The following figure depicts the search and retrieval process followed.

Figure 1: Search and Retrieval Process



From the search and retrieval process, I identified many potential articles and dissertations but did not include all of them (1063 articles screened for an initial pool of 47 articles). The significant drop in the number included was due to the large number of unrelated articles and dissertations that the search terms yielded. Because the review was focused on a very specific subset of nursing education studies (e.g., those that have nurse educator samples), it is understandable that they could only be extracted by reviewing numerous articles and dissertations related to critical thinking in nursing and other health disciplines. There were many theoretical articles that were retrieved but not included in this review.

Data Extraction. I extracted data from each article including reference information (author, year, source, and title), the definition of critical thinking used, study design, sample information including sampling approach and number of participants, data collection measures, results from the study and any additional noteworthy comments about the article or dissertation. Although blinding of those extracting the data from articles is valuable, this was not done for this review due to financial restraints. See Table 1 outlining data extracted from this review.

Quality Assessment

I completed the quality assessment of included articles and dissertations for this review which was subsequently double checked by a co-author for accuracy. Due to the small number of articles/dissertations located on this topic, a cut off level of quality was not used to decide whether to retain or discard the article or dissertation from the review. Instead, criteria were used to compile trends extracted from the articles/dissertations and to substantiate the need for further work on reporting research studies in this area. All quantitative and qualitative research articles/dissertations included in this review were analyzed for quality using criteria from the STROBE (strengthening the reporting of observational studies in epidemiology) statement for observational studies and the Mays and Pope (2000) qualitative study review criteria. A combined analysis tool was used to compile the results for both types of research studies. See Table 2 outlining the main points from the quality assessment of the articles/dissertations included.

Results

Based on the extracted data and the quality assessment related to each study, the answers to the questions guiding this review are as follows:

Question 1: Over the past 12 years (2000 to current), how have nurse educators' critical thinking skills and/or dispositions been measured or explored in nursing education? Since 2000, nurse educators' critical thinking has not been studied extensively. Only ten studies were located for the review period; six of these studies were published in peer-reviewed journals and four were dissertations. One of the articles was part of a dissertation thus the results reported in the publication and dissertation (Blondy 2007; Blondy, 2011) were counted as one study. Interestingly, studies included in this review published closer to 2000 were more focused on establishing nurse educators' conceptions of critical thinking, while later studies focused on understanding how to measure nurse educators' critical thinking. I explored the research designs, data collection methods, and sampling practices to help illuminate how nurse educators' critical thinking has been analyzed over the past 12 years. Four research studies included in this review were conducted in the United States, two were conducted in Canada, and one was conducted in New Zealand, as well as Thailand/USA .

Design and Data Collection Methods. As evident in the extraction table (Table 2), I identified both quantitative and qualitative studies examining nurse educators' critical thinking in the time period of 2000 to 2012. The quantitative studies used primarily descriptive or correlational designs. However, three out of the six primarily quantitative studies used both qualitative and quantitative data

gathering approaches, which speaks to the growing understanding that both quantitative and qualitative research methods are needed to understand nurse educators' critical thinking. I also found an expanding use of qualitative research methods to study nurse educators' critical thinking. The qualitative research articles and dissertations included in this review used interpretive designs.

The methods employed for data collection varied in the studies. The California Critical Thinking Skills Test (CCTST) and California Critical Thinking Disposition Inventory (CCTDI) were used in four out of ten studies identified. Other quantitative data collection tools included a researcher-created survey to measure barriers to critical thinking in nurse educators (Blondy, 2007), researcher created questionnaires to survey conceptions of critical thinking (Gordon, 2000; Goyne, 2001), a measure of research utilization (Profetto-McGrath et al., 2009), the Learning Environment Preferences (LEP) tool (Zygmont & Schaefer, 2006), and interviews (Raymond & Profetto-McGrath, 2005; Zygmont & Schaefer, 2006). The researchers who completed the qualitative studies included in this review mainly used interviews as their data collection method. One study also used observations and document reviews (Hobus, 2008).

Sample and Sampling. Overall, the sample sizes varied among the ten studies reviewed from a sample of one participant to 287 participants. However, seven of the ten articles or dissertations reported study samples composed of less than 50 participants. The most popular sampling technique in the group of quantitative studies was a convenience sample; only two studies used randomization. Reported response rates for the studies ranged from 12% to 54%

with many studies not reporting this statistic. Qualitative sampling was purposive in some studies however, most researchers used a convenience approach.

Question 2: What do studies published from 2000-2012 examining nurse educators' and/or students' critical thinking tell us about how critical thinking exists in the nurse educator population? More specifically: what themes are evident from the completed research, what are the significant results, what definitions or frameworks form the conceptual basis for the research completed, and what is the effectiveness of different research designs that have been used?

Themes. I identified three themes based on my analysis of the quantitative and qualitative research findings reported in the studies reviewed. These themes included: a) variation of critical thinking definitions; b) barriers and facilitators of nurse educators' critical thinking; and c) contextual factors impacting critical thinking in nursing education.

Scheffer (2000) initially pointed out the non-uniformity of critical thinking definitions in nursing and that nurse educator participants infrequently cited published definitions of critical thinking when asked. While some researchers call for a consensus definition of critical thinking in nursing education (Jenkins, 2011), other researchers have found that some nurse educators prefer a choice of various definitions (Raymond & Profetto-McGrath, 2005). The use and choice of critical thinking definitions that underpin the studies included in this review varied. Authors of four of the ten articles or dissertations specified a particular definition upon which their research was based. Three out of four authors who

included a critical thinking definition to guide their work chose Facione's (1990) definition. Authors for the remaining studies did not provide any rationale as to why they omitted a definition.

Some studies offered a traditional view of critical thinking that included rational logical thought in combination with the essential nature of attitudes and dispositions (Walthew, 2004). However, I noted differences in how some studies defined critical thinking from a nursing perspective; differences supported in the literature. Gordon (2000) found that when compared to non-nurse scholars, nurse scholars were less likely to agree that interpretation was a component of critical thinking; and more likely to regard decision-making and problems solving as similar or the same as critical thinking. Additionally, participants in Goyne's (2001) study identified intuition and subjective knowing as part of critical thinking. Goyne also identified that critical thinking could be sub-categorized into purpose elements (to assist in decision-making, problem solving and outcomes), knowledge elements (arising from nursing knowledge and experience), and process elements (use of both skills and dispositions). Jenkins (2011) identified cultural differences in how nursing scholars defined critical thinking in the United States and Thailand. Participants from Thailand identified a strong link between happiness and critical thinking, whereas those from the United States suggested decision making was a stronger component of critical thinking. The participants in Jenkins' study also identified that a consensus nursing definition of critical thinking would have benefits to nursing, with risks such as losing the "richness of multiple perspectives" (p. 272).

In addition to the variation of critical thinking definitions, barriers to and facilitators of critical thinking were discussed in the literature. Within the studies identified in the literature, authors discussed a variety of individual, group and contextual factors. Raymond and Profetto-McGrath (2005) identified individual factors, such as health and dispositions, as helpful to one's critical thinking. Blondy (2007) added decreased knowledge and time as additional individual barriers. Contextual barriers that decreased nurse educators' ability to think critically included: absence of a consensus definition of critical thinking, inconsistent measurement, decreased professional development opportunities, student focus on grades (Blondy), closed environments, unsupportive leadership (Raymond & Profetto-McGrath), oppressed group behaviours, and intolerance for divergent opinions (Scheffer, 2000). Environmental factors that were reported in the literature included open and trusting contexts, support for creativity (Raymond & Profetto-McGrath), open leadership, trusting environments, comfortable contexts (Scheffer, 2000), as well as support for reading and writing (Raymond & Profetto-McGrath, Scheffer).

Another theme I found during this review was the impact of context on the actualization of critical thinking. Jenkins (2011) pointed out that one cannot separate nursing knowledge from critical thinking in nursing. That is, the nursing context, which is influenced by culture, impacts the definition and usage of the term critical thinking. Walthew (2004) indicated the fundamental importance of context, relationships, and emotions on critical thinking. An additional link between context and critical thinking was identified by Goyne (2001) who

highlighted that critical thinking is informed by nursing specific knowledge and experience. I found that each individual educator has an impact on the context in which critical thinking occurs. For example, Hobus (2008) identified the individual and contextual nature of critical thinking and the role that life and educational experiences have on its development. Given the unclear nature and generalizability of critical thinking skills and abilities, understanding the specific individual and contextual factors is an important step to understanding the complexity of critical thinking.

Significant Results. The results from the quantitative research studies included in this review proved informative, with some notable differences and similarities. Researchers of the three studies that utilized the California Critical Thinking Skills Test (CCTST) found that the overall total mean score was higher in each of the studies when compared to the published norm group mean (Facione & Facione, 1994). This is understandable given that the published norm at that time was based on college level student scores. As well, in each of the three studies, the analysis subscale scores demonstrated strong or almost strong for all mean scores. The results of the other CCTST subscales mean scores for all three studies were ranked moderate, with no weak subscale mean scores noted (Blondy, 2011; Raymond & Profetto-McGrath, 2005; Zygmont & Schaefer, 2006).

There was a similar ranking of subscales in two studies in which researchers utilized the California Critical Thinking Disposition Inventory (CCTDI). In the study by Raymond and Profetto-McGrath (2005), the highest

scores were achieved on the inquisitiveness subscale whereas the lowest three subscale scores were analyticity, truthseeking, and systematicity. Profetto-McGrath, Bulmer-Smith, Hugo, Patel and Dussault (2009) found the same rankings in terms of highest and lowest subscales scores. However, in this case, the order of the bottom three subscales was systematicity, analyticity and truthseeking (Profetto-McGrath et al). Overall, both studies reported a CCTDI mean total score greater than 280, indicating participants' positive inclination to think critically.

Other scales and measures in the reviewed articles were the Learning Environment Preference (LEP) tool (Zygmont & Schaefer, 2006), a measure of research utilization (Profetto-McGrath et al, 2009), researcher developed questionnaires about definitions of critical thinking (Gordon, 2000; Goyne, 2001), and a researcher created tool to measure barriers to critical thinking (Blondy, 2007). I was not able to draw a comparison between studies since none of these tools were evident in more than one study. Nevertheless, I did note some significant and insignificant correlations relating to the above measures. Blondy, using that study's researcher developed barrier measurement tool, established a possible significant link between education level and the number of barriers educators' experienced. Profetto-McGrath established a significant link between overall critical thinking dispositions and all types of research utilization. Zygmont and Schaefer found a lack of correlation between the CCTST and the LEP tool used in their study.

Definitions and Variation of Research Designs. Overall I found there were limited definitions or conceptual frameworks used in the studies reviewed. This could be due, in part, to the fact that the majority of studies focused on exploring how to best conceptualize or define critical thinking in nursing education. The studies that did include a definition favoured the one by Facione (1990), possibly because it forms the conceptual basis of both the CCTST and CCTDI that were used by these same researchers.

I also assessed the quality of the studies included in my review. It was difficult to ascertain the quality of most studies owing to the limited reporting of many details. Missing details often included: identification of the research design in either the abstract or title, lack of research questions, and limited discussion of the reliability/validity (quantitative) or credibility/fittingness (qualitative) criteria of the tools used. It is worth noting that the dissertations included as part of this review were more detailed than the articles, which may have positively skewed the results of the quality assessments when scores were examined. Overall, it would have been helpful if authors of the articles and dissertations offered more consistent reporting of various aspects of their studies.

Limitations

Limitations to this integrative review included a potential for language bias given that this review only included articles and documents written in English. As well, the time frame chosen (2000 - 2012) may have excluded some additional articles and dissertations related to the topic. Although articles were

reviewed by two individuals, additional review from other individuals may have offered a different outcome.

Discussion and Future Implications

Based on the results of this review, it is evident that the study of nurse educators' critical thinking is still in its infancy and in an exploratory phase. Given the type and number of studies completed since 2000, more research is required to understand how critical thinking exists in the nurse educator population and how we can best study it. It is evident from this review that there are a mix of qualitative and quantitative studies from those exploring how critical thinking is defined by nurse educators to further understanding of the complexities of the context, including barriers and enhancers of nurse educators' critical thinking. More specifically this review pointed to some areas where research is most needed, including uncovering and testing defining concepts, exploring effective measurement methods, and understanding factors that impact nurse educators' critical thinking in various education settings. I discuss each of these areas below.

First, research is needed to understand how critical thinking exists conceptually; specifically, how we define it as nurse educators and how we use it to improve the education of students. It is clear that the authors whose research I included in this review still struggled with the lack of a consensus definition of critical thinking in nursing education. Jenkins (2011) outlined that delineating a unifying language around critical thinking is a benefit to creating a consensus definition. However, Jenkins also identified that limiting our definition may limit

the richness that comes with having multiple perspectives. One area that was absent from the research surrounding nurse educators' critical thinking involved the strategies needed to mobilize nurse educators' critical thinking for the development of students' critical thinking. The theoretical literature in this topic area examines many strategies that are used to foster students' critical thinking; however limited research exists examining what role nurse educators' critical thinking plays in implementing specific teaching strategies. Given the importance of evidence-based teaching initiatives, more research in this area would add to the growing knowledge base.

Second, this review highlighted the use of various measurement tools related to critical thinking and some possible correlating factors (e.g., barriers, learning environment preferences, research utilization). The most common tools used to measure critical thinking in nurse educators have been the California Critical Thinking Assessments, which have accentuated higher and lower ranking subscales. Given the limited use in the nurse educator population, it is too early to say whether these tools are the best measures of nurse educators' critical thinking. More research is needed to examine whether the patterns identified using the CCTST and CCTDI will continue to emerge. As well, the completion of the California Critical Thinking assessment tools by larger and more diverse nurse educator samples would improve understanding of nurse educators' scores and tendencies. Qualitative studies were also captured in this review. Most qualitative studies I included were interpretive in nature and used interviews as

the primary approach to gathering data. Additional qualitative work is needed to enrich current data and compliment the quantitative findings in this area.

This review highlighted research examining nurse educators' critical thinking. The conclusions I have made emphasize the need to further explore many of the impacting factors related to nurse educators' critical thinking. The work regarding barriers, facilitators, and the role of context on nurse educators' critical thinking continues to produce important insights that need further exploration. Overall this review of theoretical and research based literature offers a variety of important findings related to what is known about nurse educators' critical thinking and points to what further research is required. The ongoing work by researchers to explore definitions, measurement, and understanding of nurse educators' critical thinking is a key component in the development of nursing students' critical thinking.

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Table 1: Integrative Review Data Extraction

Study Authors and Type of Document	Guiding Definition of Critical Thinking	Term used for participants	Type of Study	Sample Size, Sampling Method, and Response Rate (Quantitative)	Data Collection Methods	Main Results
1a. Blondy, 2011 Publication	Not specified	Nursing Faculty Members	Quantitative Descriptive Exploratory	N=49 Method: not specifically stated Response Rate – 85%	CCTST	CCTST mean total score– 22.21 (3.64) -No correlation with demographic variables -No CCTST subscale findings reported
1b. Blondy, 2007 Dissertation	Facione	Nursing Faculty	Quantitative Descriptive Correlational with cross sectional survey method	N=49 Method: Purposive convenience Response Rate – 85%	CCTST Barrier Tool	-CCTST scores from highest to lowest on subscales were induction (12.59), inference(10.37), deduction(9.53), evaluation (6.53) then analysis (5.22) - barriers scale mean was 6/20 and professional barriers ranked the highest with personal barriers being ranked the lowest -potential correlation between types of barriers -possible link between education level and number of barriers
2. Raymond & Profetto-McGrath, 2005 Publication	Facione	Nurse Educator	Descriptive Exploratory with quantitative and qualitative data gathering methods	N=11 for quantitative and N=6 for qualitative Method: not specifically stated Response Rate - 44% (quantitative)	CCTST CCTDI Interviews	CCTST – 21.18 induction(9.55), deduction(9.55), evaluation (8.64), inference (6.82), analysis (5.73) -CCTDI – 331.55 (34.45) with subscale scores: inquisitiveness (53.91), OM (49.82), confidence (48.91), maturity (46.82), analyticity (45), truth-seeking (43.82), systematicity (43.45) -NEs identified many internal and external barriers and facilitators of their critical thinking. - NEs identified and preferred multiple CT

						definitions
3. Profetto-McGrath, Bulmer-Smith, Hugo, Patel, and Dussault, 2009 Publication	Facione	Nurse Educator	Quantitative Non-Experimental using cross sectional survey data gathering methods	N=287 Method: Random Purposive Response Rate: 54%	CCTDI Research Utilization Measure	-CCTDI 327.35 (23.72) with Sub-Scale scores: inquisitiveness (50.86), maturity (48.24), confidence (46.77), Open-mindedness (46.14), systematicity (46.01), analyticity (45.35), truth-seeking (43.98) -97.5% of respondents scored over target range of 280 in their overall score. - Significant correlations were found to certain types of research use.
4. Walthew 2004 publication	Not specified	Nurse Educator	Qualitative Descriptive Interpretive	N=12 Method: Purposive convenience Response Rate: 12 out of possible 18 – 67%	Interviews	-Participants were asked to describe critical thinking, and discuss student work demonstrative of CT. -Emerging themes were information gathering, linking theory to practice, problem solving; attitudes and dispositions; intuition and subjective knowing; contextual knowing, and connecting.
5. Zygmont & Schaefer, 2006 Publication	Not specified	Faculty	Descriptive Correlational data triangulation using qualitative and quantitative data gathering methods	N=37 Method: Randomized at first, then convenience due to low response rate Response Rate: 12%	CCTST LEP Interviews	-CCTST 19.14 (6.76) with Sub-Scale scores: induction(11.08), inference (8.97), deduction (8.05), evaluation (5.37), analysis (4.78) -No faculty achieved position 5 which is indicative of Critical Thinking on LEP -no correlation between CCTST and LEP -interviews resulted in many unique descriptions of CT
6. Jenkins, 2011 Publication	Not specified	Nurse Scholars and Nurse Educators	Qualitative Unspecified Method	N=10 Method – Not clearly identified but possibly purposive	Interviews	Themes – techniques for CT, impact of potential consensus definition, essential components of CT, characteristics (indicators) of CT, and technique for evaluating CT

		used inter-changeably				-unexpected findings: staying calm in emergencies indicates CT; happiness as essential component from Thai educators, and most participants want a consensus definition of CT -Link to cross cultural differences and similarities amongst nurse educators and CT
7. Gordon, 2000 Publication	Not specified	Nurse Educator	Quantitative Descriptive Exploratory	N= 201 Method – Randomization of schools where invitations to participate for all nurse educators were sent. Response Rate: 51%	Questionnaire	-no correlation found between rank and level of education -nurse scholars were more likely to include the nursing process, problem solving, researching, decision-making, and clinical reasoning as CT skills -nurse scholars less likely to include interpretation as a skill of critical thinking compared to non-nurse scholars. -nurse scholars believed their conceptualization of CT was congruent with definitions in other disciplines.
8. Hobus, 2008 Dissertation	American Association of Colleges of Nurses (AACN)	Nursing Educator	Qualitative Interpretive	N=3 (I nurse educator and 2 nursing students) Method – Purposive/ Convenience	Documents Interviews, Observations Journal Entries Assignments Reflections	Each nurse develops their own definition of CT through experiences in their life and through their education.
9. Goyne, 2001 Dissertation	Not specified	Nursing Educator	Quantitative Descriptive, Non-Experimental	N=208 Method: Random, Proportionally Stratified	Questionnaire	Nurse educators defined CT as having purpose elements (decision making, problem solving, outcomes), domain knowledge elements (experience and knowledge) and process elements (dispositions and skills). Logical reasoning and analysis most prevalent whereas intuitive thinking, creativity and outcomes

						least prevalent. NEs have highest support for inquisitiveness and the least support for the inclusion of explanation as part of the definition of critical thinking.
10. Scheffer, 2000 Dissertation	Not specified	Nurse Educator	Qualitative Interpretive Case Study	N=17 Method: Purposive, Critical, Snowball	Interviews	Emerging Themes: - Thinking is not readily reflected on from NE population, - Dispositions of critical thinking include curiosity, love of problem solving, love of reading. - Enhancers of critical thinking include role modeling from leadership, influence of environment. - NE confuse their CT with other things, including the critical thinking of students. - NEs find it difficult to articulate their thinking to students and it is hard for NEs to separate thinking and doing.

Abbreviations:

CCTST – California Critical Thinking Skills Test

CCTDI – California Critical Thinking Disposition Inventory

NE – Nurse Educator

LEP – Learning Environment Preferences Assessment

Table 2: Integrative Review Quality Assessment

Study Authors and Type of Document	*Research Design Stated in Title and/or Abstract*	*Design Clearly Identified in Document*	*Research Questions or Purpose Clear in Document*	*Setting and Population Described*	*Data Collection Methods Clearly Identified and Explained*	*Sample and Sampling Clearly Explained*	*Data Analysis Methods Described*	*Steps to Ensure Truth Value, Applicability, Consistency and Neutrality of Results*	*Limitations or Potential Bias(es) Discussed*
1. *Blondy, 2011 Publication*	Not in either	Yes	Purpose Clear	Limited Information	Yes	Not clear	Yes	Limited Information	Yes
Blondy, 2007 Dissertation	Yes in both	Yes	Questions Clear	Yes	Yes	Yes	Yes	Yes	Yes
2. *Raymond & Profetto-McGrath, 2005 Publication*	Not in Title. Yes in Abstract	Yes	Questions Clear	Yes	Yes	Yes	Yes	Limited Information	Yes
3. *Profetto-McGrath, Bulmer-Smith, Hugo, Patel, & Dussault, 2009 Publication*	Not in either	Yes	Purpose Clear	Yes	Yes	Yes	Yes	Limited Information	Yes
4. *Walthew, 2004 Publication*	Not in Title. Yes in abstract	Yes	Purpose Clear	Yes	Yes	Not clear	Limited Information	Limited Information	Limited Information
5. *Zygmont, Schaefer, 2006 Publication*	Not in either	Yes	Purpose Clear	Yes	Yes	Yes	Limited Information	Yes	Limited Information
6. *Jenkins, 2011 Publication*	Not in Either	No	Neither Clear	Yes	Yes	Yes	Limited Information	Limited Information	Yes

7. *Gordon, 2000 Publication*	Not in either	Yes	Questions Clear	Yes	Yes	Yes	Limited Information	Limited Information	No
8. *Hobus, 2008 Dissertation*	Yes in Title Not in Abstract	Yes	Questions Clear	Yes	Yes	Yes	Yes	Limited Information	Limited Information
9. *Goyne, 2001 Dissertation*	Not in either	Yes	Questions Clear	Yes	Yes	Yes	Yes	Yes	Yes
10. *Scheffer, 2000 Dissertation*	Yes in Abstract Not in Title	Yes	Questions Clear	Yes	Yes	Yes	Yes	Yes	Limited Information

Chapter Four

Paper 2: Nurse Educators' Critical Thinking

A Mixed Methods Exploration

Critical thinking has been a focus in the nursing education literature for more than 30 years and is an intended outcome of many nursing programs. Numerous authors have discussed the importance of nurses' critical thinking when managing complex environments and providing quality patient care (Banning, 2006; Brunt 2005a; Chan, 2013; Potgieter, 2012). Despite the value of critical thinking, the complexity, immaturity, and elusive nature of the concept are also evident (Mundy & Denham, 2008; Riddell, 2007). Given the lack of a consensus definition, how to best facilitate the development of critical thinking in nursing graduates remains a central concern. In this article I will review pertinent literature to outline what is known about the role of critical thinking in nursing education. This includes factors that enhance and act as a barrier to nurse educators' critical thinking; related teachings strategies known to foster critical thinking; and relevant critical thinking definitions. After reviewing the gaps in the literature, I will present the guiding questions that form the basis for the mixed methods research study I completed.

Background and Literature Review

Critical Thinking in Nursing Education. To date, there has been a multitude of studies examining the existence, as well as the development of nursing students' critical thinking skills and dispositions (Brunt, 2005a; Profetto-McGrath, 2003). Several variables need to be present to create facilitative

environments in which critical thinking can develop; one of the variables is the educators' critical thinking. Yet, in adult education literature I could not locate any articles that addressed the role of educators' critical thinking in facilitating students' development of critical thinking. It has been assumed that nurse educators have strong critical thinking skills that play an integral role in the critical thinking development of their students. Nevertheless, limited research in either nursing, or adult education has been conducted to support this premise. Of the research that has been published in nursing, the level of nurse educators' critical thinking has varied (Zygmont & Schaefer, 2006). Therefore, I have chosen to explore the role of nurse educators in the development of student's critical thinking. More specifically, I studied the nature of nurse educators' critical thinking along with its barriers and enhancers.

The development of critical thinking can occur in various learning environments (e.g., laboratory, classroom, and/or clinical settings and in online education). To date, no author has reported any research findings that describe the role of a supportive context for critical thinking in nursing education. More specifically, researchers have not differentiated between nurse educators' critical thinking in classroom versus clinical settings. Brookfield (2012) outlined the importance of social learning and its impacts on the development of critical thinking. If critical thinking is better developed in an applied and experiential setting, then it is important that we examine how nurse educators' critical thinking manifests in clinical practice settings in order to foster these behaviours in future learning environments.

Facilitators of and Barriers to Critical Thinking in Nursing Education. Authors have reported many facilitators and barriers related to critical thinking in nursing education. More specifically, the literature describes how the facilitators and barriers impact: a) individual nurse educators (Raymond & Profetto-McGrath, 2005), b) the implementation of teaching strategies by nurse educators (Shell, 2001, Mangena & Chabeli, 2005), and c) the overall facilitation of critical thinking in nursing education (Mangena & Chabeli). The documented barriers and facilitators of critical thinking are linked together and reflect factors that exist within, and external to, nurse educators.

The internal facilitators of critical thinking found in the literature are: physical and mental well-being, willingness to learn more and develop one's critical thinking abilities, possessing characteristics or favorable dispositions known to support strong critical thinkers, and engaging in personal activities such as reading, writing, and thinking (Raymond & Profetto-McGrath). External facilitators include: engaging in faculty development related to critical thinking, having collegial support and a supportive milieu, having access to mentors and positive role models, and having nursing and teaching experience (Mangena & Chabeli, Raymond & Profetto-McGrath).

Individual internal barriers (those emanating from within the nurse educator) to critical thinking comprise: making assumptions and failing to examine them further, teaching solely for the purpose of covering content, lack of or limited knowledge, resisting change, and a negative attitude (Raymond & Profetto-McGrath, Mangena & Chabeli). External barriers (those existing

unrelated to the nurse educator) to critical thinking include: negative student attitudes, time and teaching constraints, large amount of content to be covered, and negative colleagues and administrators (Mangena & Chabeli, Raymond & Profetto-McGrath, Shell). It is evident from the limited literature that there are many factors that appear to impact critical thinking and how it is used in nursing education.

Critical Thinking Teaching Strategies. There are many documented ways that nurse educators can help students to develop critical thinking. Critical thinking requires the educator to be active in the learning process (Twibell, Ryan, & Hermiz, 2005). Part of the social nature of developing critical thinking involves role modeling, appreciating alternatives, understanding assumptions, and questioning (Brookfield, 2012). Role modeling critical thinking also includes techniques such as thinking aloud with students and using higher level questioning (Brunt, 2005a; Riddell 2007; Walsh & Seldomridge, 2006). Another method to foster critical thinking includes promoting student excitement and inquisitiveness about nursing contexts (Potgieter, 2012). Overall, questioning and role modeling appear to be important ways to foster students' critical thinking in nursing and to demonstrate critical thinking in action. Although assumed, it is unclear how nurse educators' critical thinking specifically impacts the selection and application of teaching techniques in the clinical setting. Based on the need to understand the role of nurse educators' critical thinking in the development of students' critical thinking further, I completed a mixed methods triangulation design research study.

Relevant Definitions. There is an ongoing debate surrounding the various definitions of critical thinking. Critical thinking has been defined in numerous ways; however, contextual influences may impact how a definition is operationalized. For example, in clinical settings, certain nursing specific definitions of critical thinking may be more applicable than general ones. For the purpose of this study, two definitions of critical thinking were used. The definition by Facione (1990) based on his work with the American Philosophical Association (APA), is the main critical thinking definition for this study. The APA states:

> We understand critical thinking to be purposeful, self-regulatory judgment that 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… The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit (p. 4).

The second definition for the study was drawn from Scheffer and Rubenfeld (2000) and was based on a rigorous Delphi technique they applied to achieve a consensus definition from a nursing point of view. They state:

> Critical thinking 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 second definition was included because it reflected the importance of context in defining critical thinking from a nursing perspective. In addition, the inclusion of intuition, creativity and contextual perspective emphasizes the role of critical thinking as "an essential component of professional accountability and quality nursing care" (Scheffer & Rubenfeld, 2000, p 357). Both definitions were generated by experts in the field as part of Delphi studies to identify critical thinking skills and dispositions.

In addition to the definition of critical thinking, I also defined nursing education and nurse educator for my research study. Nursing education is defined as the baccalaureate preparation of nursing students comprised of clinical, classroom, and laboratory related learning experiences. The focus of the completed research study was on clinical education that was led by nurse educators and occurred in a variety of health care settings. For the purpose of this study nurse educators were registered nurses, with a minimum preparation of a

baccalaureate degree, who taught nursing theory and/or practice in a baccalaureate nursing program.

Study Purpose and Guiding Questions

The purpose of this study was to explore and determine nurse educators' critical thinking in practice. The research questions that guided this study were:

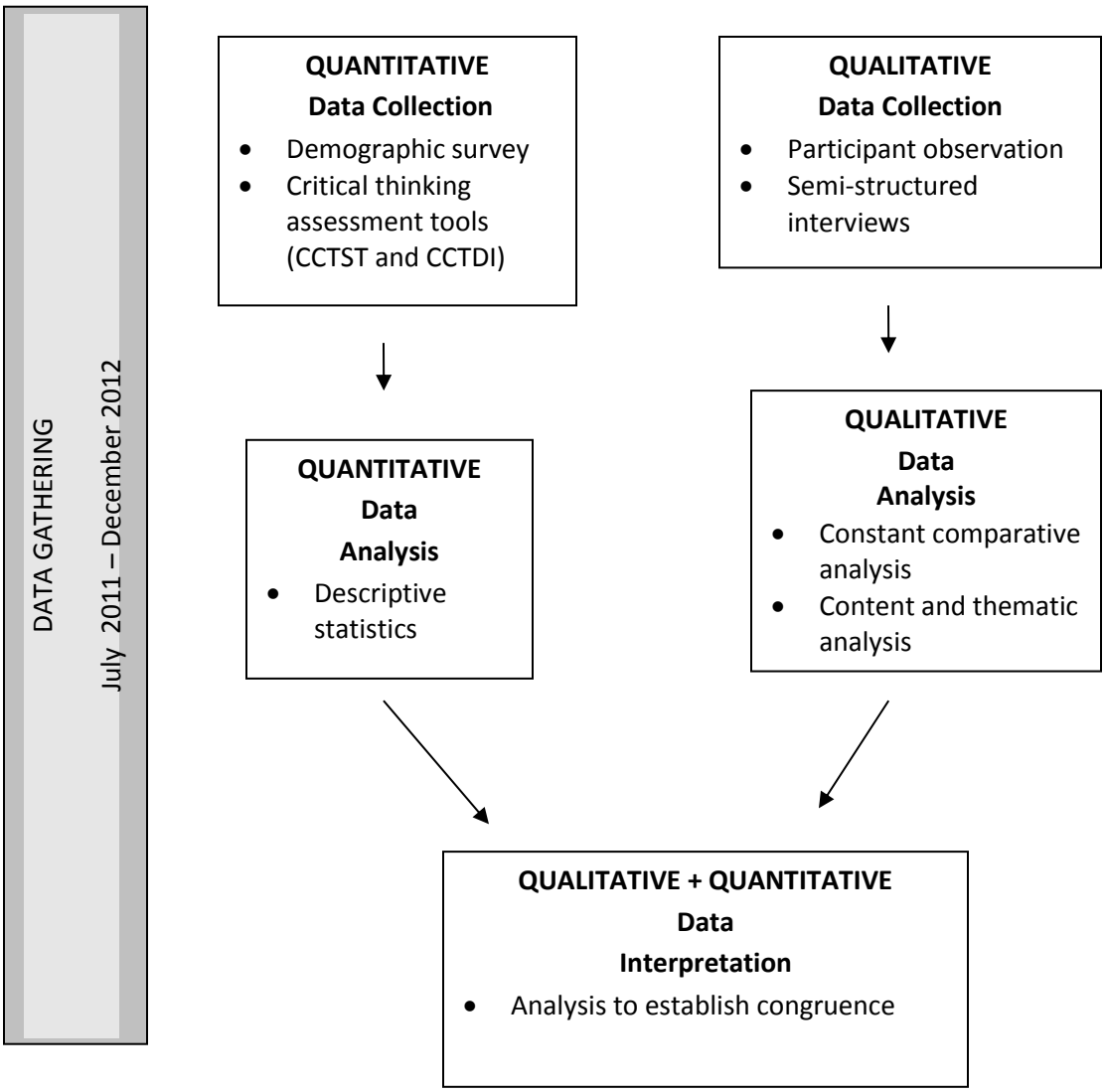
1. What is the critical thinking of nurse educators?
2. How is critical thinking revealed by nurse educators in the clinical setting?
    a. What indicators of nurse educators' critical thinking are evident in the practice setting?
    b. How do nurse educators describe how they reveal critical thinking in the practice setting?
3. What facilitators and barriers impact nurse educators' critical thinking skills and/or dispositions in practice? How so?

Design

I chose a single-phase triangulation mixed methods design for this study with multiple data gathering techniques as outlined by Creswell and Plano Clark (2007), and as illustrated in Figure 2. The elements of mixed methods research include collecting, analyzing and "mixing both quantitative and qualitative data in a single study or series of studies" (p. 5). The complexity of critical thinking in nursing benefitted from using multiple methods to comprehensively reveal the nature of nurse educators' critical thinking. Charmaz (2004) claimed that "gaining multiple views of the phenomena strengthens the power of our claims to understand it" (p. 983). I chose a mixed methods research (MMR) design to best

answer the questions posed in this study (Johnson & Onwuegbuzie, 2004) and to illuminate how critical thinking is used in teaching practice.

Figure 2: Triangulation Mixed Methods Design



Creswell and Plano Clark (2007) emphasized the efficiency of the triangulation design where data collection can occur approximately at the same time and where one method is not dependent on the completion of other data collection approaches. As well, the triangulation design is the most common and easiest for beginning researchers to use (Creswell & Plano Clark). By using this method, I was able to work across languages and transverse various forms of narrative to get closer to the "whole story" (Sandelowski, 1996, p. 112). In my study, triangulation of data collection methods decreased the predominance of primarily quantitative approaches and helped "obtain different but complementary data on the same topic" (Morse, 1991, p. 122). Yielding qualitative and quantitative data also eliminates the common binary or dichotomous thinking that favours one type of data over another (Giddings, 2006). Triangulation in my study consisted of concurrent data gathering using a demographic survey, two critical thinking self-assessment tools, participant observation, and semi-structured interviews.

Sample and Ethical Considerations

The setting for my study was a large Western Canadian academic institution offering baccalaureate nursing education with clinical courses occurring in the vicinity. I chose a large baccalaureate nursing program because it offered a substantial population of nurse educators and the potential for participant anonymity.

Sample, sampling strategy, and recruitment. I recruited for this study using a convenience sample method. I specifically invited, via email, clinical

nurse educators who were scheduled to teach clinical courses during the period of the study. Those interested in participating were invited to complete both the qualitative and quantitative data collection aspects of the study. The inclusion criteria for the sample encompassed current employment within the selected nursing program, teaching second or third year courses in medical/surgical clinical units, a minimum of one term teaching experience (including experience with clinical teaching), and a teaching assignment that included one of the selected clinical courses during the data collection period. The targeted sample size was five to seven participants given the numerous and in-depth data gathering approaches planned. Five educators completed both the quantitative and qualitative aspects of the study.

After the planned approach received a very low response from invited nurse educators, I altered the sampling method. Initially I invited all educators within the program to complete the quantitative portion of the study. Based on the initial sample of participants, I had planned to invite a randomly selected subgroup to participate in the qualitative portion of the study. With the very limited nurse educator response, despite multiple calls for participation for the quantitative aspect of the study, I resubmitted for ethics approval to alter the initial recruitment approach. After re-approval was obtained, I identified specific participants and invited each of them to participate in both the quantitative and qualitative aspects of the study.

Ethical considerations. I sought and received ethics approvals from the Human Research Ethics Boards associated with the chosen academic and clinical

settings I wanted to use in my research. Using their individual site and specific unit approval processes, I received administrative approval from the clinical setting(s) where the nurse educators were teaching during data collection. Participants did not receive compensation for taking part in the study however, I offered each person a gift card for coffee as a thank you for their participation. All participants' identities were kept confidential throughout the study.

I addressed ethical considerations related to nurse educator participant observation using multiple consent forms. I received signed consent forms from all nurse educator participants and their respective student groups. Given their proximity to the participant observation, every shift I also sought additional verbal consents from the nurses and unit staff. I asked for consent from other staff or students if any gestures, words, or conversations with nurse educator participants were used in the study. I posted general signage on the unit indicating that observational research was underway. Those not willing to be part of the observations in any way were able to identify themselves, thus their professional and/or care interactions were not observed or recorded. I did not observe or record any observations between nurse educators and patients and/or patient families in this study.

Method

I collected data for this study using a demographic survey, the California Critical Thinking Skills Test (CCTST), the California Critical Thinking Disposition Inventory (CCTDI), participant observation in practice settings, and semi-structured interviews. Each data collection method is further described.

Demographic Survey. I designed a one-page survey specifically for my study to examine variables such as age, educational preparation, and professional development related to critical thinking. It was completed by all participants and updated at the end of the study to reflect any changes.

Instruments. I asked participants to complete both the California Critical Thinking Skills Test (CCTST) and the California Critical Thinking Disposition Inventory (CCTDI). These instruments were completed online through the Insight Assessment website (www.insightassessment.com).

The CCTST consists of 34 multiple choice questions related to generic situations and took approximately 45 minutes to complete. The total score and each of the seven subscale scores were reported on a 100-point scale. Scores below 63 indicated a low or non-manifested level of critical thinking skill. Scores 63 to 69 indicated weak overall skill level, 70 to 78 moderate overall skill level, 79 to 85 strong overall skill level, and greater than 85 indicated superior critical thinking skill level. The seven CCTST subscales include: analysis, evaluation, inference, deduction, induction, interpretation, and explanation (Insight Assessment, 2013a). The version of the CCTST used in this study was a more recent and revised version than one used in previous studies using nurse educator participants. In this study, I report the scores for the two newer subscales (interpretation and explanation), in addition to the other five subscales.

The CCTDI has 75 generic statements with a six-point Likert scale and took approximately 20 minutes to complete (Facione, Facione & Sanchez, 1994; Profetto-McGrath 2003). Each statement corresponded to a subscale or

disposition of truth seeking open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and maturity. Potential scores can range from 5 to 60 for each subscale for a total maximum cumulative test score value of 420. The final score represented the strength of the participant's disposition to think critically. Scores below 280 represented a weak disposition to think critically, a score of 280 to 349 denoted a positive inclination to think critical thinking, and a score over 350 indicated an overall strong disposition (Facione Facione & Sanchez; Profetto-McGrath). Insight Assessment provided online scoring for the completed CCTSTs and CCTDIs. I accessed and assessed participants' results after the completion of all of the participant observation and interview phases of the study to ensure that the results did not influence my observations.

Participant observation. I used participant observation in this study by being part of their experience to gain in-depth understanding of nurse educators' critical thinking (Charmaz, 2004). This method of data collection has been deemed one of the most important approaches to gathering data in nursing research (Moore & Savage 2002; Parahoo, 1997). For this study, I used non-covert unstructured observations of nurse educators in an acute care setting where nurse educators were engaged in the supervision of students in clinical practice. The nature of my observations focused on the nurse educators' behaviours, characteristics, verbal and nonverbal communication, general activities, as well as the environmental conditions (Loiselle, Profetto-McGrath, Polit, & Beck, 2010). I made students and staff aware of the observations through a written and verbal consent process, respectively. I emphasized multiple times that student or staff

performance was not being evaluated or was a focus of my research. My role as researcher was as "observer as participant" where observing was the primary focus versus becoming a participant in the environment. Gold (1958) and Johnson (1992) described observer as participant as maintaining partial objectivity yet not getting too involved in the day-to-day experiences and tasks. To gain the trust of participants I did engage in some general non-care related activities, which I deemed important in order to work alongside the educators. My involvement in some insignificant activities as a researcher was intended to maintain a rapport with the educator participants (e.g., bringing linens if asked). Robertson (1982) noted that observers are more able to withdraw from the activities as needed when they are in an "observer as participant" role. I withdrew from observing as needed to record important observations and to prevent researcher fatigue. I found this provided an important break from the data collection process given the intensity of environmental stimulus.

The nurse educators and their respective students received copies of the study information sheet and their signed consent form. The observation phase for each nurse educator took place over a four-day week. Hsu (2006) observed clinical educators for two days to record characteristics of effectiveness. From Hsu's findings it was not clear whether two days were sufficient, therefore I planned to observe each participant for a maximum of four days/shifts, or until sufficient data were collected. I observed all participants for a minimum of three shifts, however some were observed for all four shifts of the planned observation period. I recorded field notes throughout the observation day, as well as at the

end of each shift of observation completed. I reached data saturation with each participant within three to four shifts. Although my plan had been to observe five to seven educators, the final sample size was five with data saturation being reached with each participant.

Interviews. I conducted two interviews with each nurse educator participant. I held one initial semi-structured interview shortly after completing the participant observation phase of the study. During the initial interview, I explored nurse educators' views on critical thinking (i.e., what facilitates it, what inhibits it, how they feel they demonstrate it, and how they understand it). During both participant interviews, I clarified previous observations and further explored them as needed. The second interview was helpful in verifying nurse educator responses and allowing them additional time to reflect on their critical thinking. Because the first interviews yielded uncertainty about what nurse educator participants thought critical thinking entailed and how they revealed it, the questions posed in the second interview were sent out in advance with the goal of fostering more complex and in-depth answers. I completed all of the interviews face to face at a location that was convenient for each participant. I digitally recorded each interview, had a transcriptionist transcribe them verbatim, and then checked each transcript for accuracy. I also sent a synopsis of each interview to each participant to ensure I captured the essence of the interview correctly.

Data Analysis and Interpretation

Data analysis for this study included multiple approaches. The CCTST and the CCTDI were scored individually by Insight Assessment. I analyzed the

total and subscale scores using descriptive statistics. The number of participants was lower than expected therefore I could not use correlational and multivariate statistical techniques, such as hierarchical linear modeling.

I analyzed the qualitative data, which were in the form of observation field notes and transcripts from both the initial and secondary interviews. In addition, I included memos and reflective journal entries from the researcher in the data analysis process. The data analysis process consisted of coding procedures and constant comparative analysis as described by Charmaz (2004). I completed the initial line by line coding for both the field notes and interview transcripts, followed by focused coding where I assigned categories to the emerging data. I made constant comparisons between the collected data and new data, as well as between the different sources of data (interview transcripts and observation field notes). I also compared data from the interviews and observations with my reflective journal entries and memos. Given the manageable amount of data, I used hand coding instead of a computer program. As well, I used my reflective journal entries and memos to provide contextual support to enhance the understanding of emerging themes and as a check system to decrease potential researcher bias. Glesne (2006) identified that data display is an important feature of qualitative inquiry. Therefore, I examined the emerging codes and larger thematic categories and created a visual representation of the data (i.e., diagram of an emerging model).

I found the integration of the quantitative and qualitative data obtained in this study was challenging as it is in many mixed methods study designs. The

difficulty in this study arose from the very different data formats and the complexity of integrating quantitative scores, interview findings, and physical observations. For this study, at first I analyzed the quantitative and qualitative data separately. After each data set was analyzed, I reviewed the two data sets (quantitative and qualitative) for similar trends and themes. I attempted to link the results from the critical thinking surveys to the participant observations to determine if the scores obtained by each participant were congruent with my observations of their actions in the clinical setting.

Trustworthiness. The value of any research depends on its applicability, consistency, and the neutrality of the factors and assessment methods used. The trustworthiness of data refers to the honest representation of a construct and experience as collected from the participants (Lincoln & Guba, 1985). Combining data collections methods requires that both data sets are true to the paradigm from which they emanate. Therefore, I assessed and fostered the reliability and validity of the quantitative data as well as the credibility, auditability, and fittingness of the qualitative data.

Reliability and Validity. The reliability and validity of the critical thinking assessment tools has been established by other researchers in both nursing and non-nursing populations. An expert consensus statement produced from the Delphi study lead by Facione (1990) for the American Philosophical Association (APA) was used to create the California Critical Thinking Assessment tools. The reliability of an instrument is the extent that an assessment tool yields similar results over time, reporting the proportion of accuracy of

measurement (LoBiondo-Wood, Haber, Cameron, & Singh, 2013). The internal consistency reliability for the CCTST using the Kuder Richardson method has been reported in the literature as 0.68 to 0.70. The CCTDI has internal consistency reliability with a Cronbach alpha of 0.90 and subscale reliability coefficients reported in the literature as ranging from 0.60 to 0.84 (Facione & Facione, 1994; Facione, Facione & Sanchez, 1994; Suliman, 2006). Nursing studies have also reported similar reliability values for these two instruments (Shin, Yoo Jung, Shin & Soo Kim, 2006; Stewart & Demsey, 2005; Stockard Spelcic et al. 2001; Suliman, 2006).

Instrument validity is based on the accuracy of the results related to the construct being measured (LoBiondo-Wood, Haber, Cameron, & Singh, 2013). Content validity of the California Critical Thinking instruments is based on the APA Delphi report and definition of critical thinking (Facione 1990). The 1990 report outlined the expert consensus statement, which also provides construct validity for the CCTST and CCTDI (Facione, Facione, & Sanchez, 1994). In their study of nursing faculty members in the United States, Stone, Davidson, Evans, and Hansen (2001) found strong support for the theoretical construct underlying the California Critical Thinking Assessment tools. Less support was evident for the actual measurement of the critical thinking construct in nursing. To date, there is no nursing-specific survey to measure of critical thinking. Although these instruments represent the most common and trusted measures of critical thinking in higher education, I needed to use them cautiously in my study due to their inconsistent results in other nursing studies.

Credibility, dependability, confirmability, and transferability.

Credibility refers to the confidence the researcher has about the findings and their representation of the participants' true perspectives. First, I strengthened the credibility of my results by triangulating my data collection methods, which fostered a deeper exploration into each participant's perspective. Other methods I used to reinforce the credibility of my study findings included the lengthy amount of time spent with each participant and the timely recording of field notes to preserve my recollection of events. I recorded field notes during observations, as permitted, and immediately after each day spent with participants. An additional activity I completed to strengthen the credibility of the interview findings included member checks after the interview transcripts were summarized. Participants affirmed that the summation of the interviews I provided them were accurate. In addition, I completed memoing to keep an open dialogue of my values, beliefs, and assumptions as the study unfolded.

My use of a reflective journal and memoing strengthened the dependability of the findings in my study. This assisted me to accurately capture the steps, activities, and decisions made during the research process. My use of a reflective journal also served as an audit trail to provide a detailed description of logistic information of the decisions made and phases of the study as the research progressed.

I enhanced confirmability of the data, or the detailed meaningfulness of the findings, by ensuring data saturation, and by offering a thick description of data interaction. I also had meaningful interactions with each participant during

the study, which emphasized the depth of the findings. During the dissemination of findings, I will further ensure confirmability by offering a practical description of results to increase applicability to practice (LoBiondo-Wood, Haber, Cameron, & Singh, 2013).

The transferability of the study findings is determined by the extent that the information is pertinent to other settings and contexts (Macnee, 2004). My findings are subject to external checks by others, who are not part of the data collection process. These comparisons by those who will read and evaluate my findings will serve to establish meaningfulness of the data. Due to the small sample size in my study, I reviewed my data multiple times to ensure there were no contradictory results to better construct a credible interpretation of nurse educators' critical thinking.

Results

Quantitative Data. Nurse educator participants in my study were an average of 36 years old, had an average of three years teaching experience and eleven years of experience in nursing. The highest degree attained in my sample was a Master's degree in nursing with most participants having a baccalaureate degree. For the CCTST, the mean score representing all five nurse educator participants in this study met the published test norms for graduate students and health professionals (Insight Assessment, 2013a). Individually, most nurse educator participants had moderate to strong critical thinking skills and an overall positive inclination to think critically. Table 3 outlines the mean scores for the critical thinking assessment tools completed by the five participants.

Table 3: Results- Quantitative Test Score Means

Component	Score (SD)	Scoring Description
CCTST TOTAL	75.08 (3.88)	**100 point scale** >85 indicates strength 70-84 indicates moderate strength <70 is an area for further development
Inference	80.40 (6.57)	
Analysis	79.20 (7.12)	
Interpretation	79.20 (7.12)	
Deduction	77.64 (6.77)	
Induction	76.08 (4.27)	
Evaluation	70.48 (4.49)	
Explanation	70.10 (3.56)	
CCTDI TOTAL	331.92 (21.03)	**Total score**: <280 indicates weak disposition 281-350 positive inclination, >350 strong inclination **Subscale Scores**: 30 negative disposition 30-39 inconsistent disposition 40-49 positive inclination 50-60 strong inclination
Inquisitiveness	54.80 (2.17)	
Open-mindedness	49.50 (3.66)	
Confidence	48.00 (4.04)	
Systematicity	45.63 (3.36)	
Analyticity	45.45 (1.84)	
Maturity	45.20 (7.46)	
Truth-seeking	43.33 (5.98)	

Qualitative Data. The qualitative data from the interviews and participant observation portions of my study revealed many intriguing themes. The emergent themes are organized and presented by the initial guiding questions I posed at the start of the study.

How is critical thinking revealed by nurse educators in the clinical setting? What indicators of nurse educators' critical thinking are observable in the practice setting? My observations suggested an interplay of "discernible and indiscernible" elements that revealed each nurse educators' critical thinking. The visible or discernible observations encompassed a variety of strategies that were

evident in the educators' learning interactions with students. Table 4 outlines my observations of the most common ways nurse educator participants shared their critical thinking in the clinical setting.

Table 4: Nurse Educators' Critical Thinking Revealed - Demonstration of Critical Thinking in Practice

- Demonstrating dispositions associated with critical thinking–humbleness, approachability and openness to student questions, embrace diversity, inquisitiveness, as well as show flexibility and understanding to diverse student needs.
- Using high level questioning–engaged and excited students with one's own passion, asked high level questions that role modeled critical thinking (high level questions were those that focused on Bloom's Revised Taxonomy levels of analyzing, evaluating, and creating).
- Applying tailored teaching–able to use a variety of strategies that reflected an understanding of where the student was at and what the student needed in order to facilitate incremental and purposeful thinking development. These included: a) demonstrating thinking aloud (clarifying, prioritizing, predicting, connecting, revealing gaps between knowledge and practice), b) facilitating group engagement when a collaborative learning situation was more effective than individual reflection, c) engaging in collaborative problem solving with students, and d) application of patient specific, quality nursing care (advocating for best practice amidst a complex interplay of patient concerns, unit politics and student needs through

demonstrating care, using precise language, seeking assistance from appropriate individuals). I also observed nurse educators used concept mapping built on their prior knowledge, and used dialectical critique of care planning in the moment to show how they applied their critical thinking in the clinical setting.

While I was observing each educator, dispositions were more readily apparent compared to cognitive skills, which were less discernible. In addition, nurse educator participants displayed both skills and dispositions when selecting and applying chosen teaching techniques. From the techniques I observed, questioning stood out as the most commonly used teaching strategy nurse educators' employed to reveal their critical thinking when interacting with students. More specifically, I noticed that educators revealed their thinking by asking higher level questions based on Bloom's Revised Taxonomy (Su, & Osisek, 2011). In doing so, educators revealed that they knew where they needed to take the students' thinking and then carefully formulated questions to help students gradually reach more complex levels of thought. Although many educators asked numerous lower level questions, they did so to gradually and purposely prepare the student for the higher level questions. Educators commented that their use of questioning was to obtain the student's explanation of the reason or rationale behind the patient care context and their planned care interventions.

Although I found that some elements of nurse educators' critical thinking were directly visible, it became obvious that there were aspects of nurse

educators' critical thinking that were indiscernible during my observations. These indiscernible aspects of nurse educators' critical thinking were revealed through discussions I had with the participants during my observations and from interviews. Participants identified many indiscernible activities that were related to the continuous evaluation of many concurring factors, among them each student's knowledge, patient care skills, and emotional state.

During the interviews, nurse educators stated that one aspect of their critical thinking included evaluating numerous contextual factors that impacted their role and the student's abilities to complete effective patient care in the clinical setting. The topics of their evaluation often included politics, patient acuity, and nurse-to-nurse communication on the unit. Participants reported that they frequently reflected on their own knowledge as well as their verbal and non-verbal communication with students as indications of their critical thinking process. When I explored the interplay of the seen and unseen ways participants showed their critical thinking, participants voiced that the less visible ways they showed their critical thinking served to augment the more visible activities observable to others in the clinical setting. I asked each educator to reflect on which critical thinking definition they primarily ascribed to as part of their clinical teaching practice. Based on their responses, I found participants were equally divided in their preference for one or the other of the two definitions they were asked to reflect on.

How do nurse educators describe how they reveal critical thinking in the practice setting? The interview data exposed that participants experienced

difficulty in defining and articulating how they demonstrated or revealed their critical thinking. Most participants stated that they had not frequently thought about their thinking and were not quite sure how they showed it to students. One participant stated, "I don't think about how I show it, it's involuntary." When I asked each participant how they revealed their critical thinking, most of the five nurse educators chose to describe how students expressed their critical thinking versus how they as educators role modeled critical thinking for the students. Participants did not initially consider dispositions as part of critical thinking or how it could be role modeled. As well, some nurse educator participants preferred to explain their critical thinking by using cognitive terms such as analyzing, evaluating, and pulling together patient information. When I asked participants how they revealed their critical thinking in the clinical setting, a variety of different verbal responses by participants were evident. Responses included: "I will ask them questions and just keep directing them….to get them thinking further", "making connections", "I've got a lot of concept maps myself that I pull out for students", "pick out, when students are describing something, the important data", "questioning…asking them why things are occurring", and "redirecting them if they're [students] going down the wrong path." Overall participants in this study identified that educators "have to think of all the paths and the ways they can get to…ask the questions they'll [students will] understand …so they [students] can build like building blocks" and pull everything together.

What facilitators and barriers impact nurse educators' critical thinking skills and/or dispositions in practice? How so? Based on the interviews and

observation phases of the study, Table 5 identifies the various barriers and enhancers/facilitators to nurse educator participants' critical thinking.

Table 5: Common Enhancers and Barriers to Nurse Educators' Critical Thinking in the Clinical Setting

Enhancers to Nurse Educators' Critical Thinking	**Barriers to Nurse Educators' Critical Thinking**
Personal	
• Nurse educators' positive dispositions • Positive physical health • Perception of a calm home life • Comfort with educator role • Adequate preparation • Positive unit culture/clinical setting • Strong knowledge base • Ability to detach oneself from personal issues while teaching	• Nurse educators' negative dispositions • Decreased physical health • Newness to teaching role • Over thinking • Lack of data/information/knowledge
Interpersonal	
• Positive relationships with students	• Unprofessional or unsafe student behaviour, decreased student understanding, or other student issues • Tension with student caused by educators' evaluative responsibility
Contextual	
• Decreased group size (<7-8) • Decreased distance between clinical units • Availability of multiple data sources	• Large clinical group (>7-8) • Increased distance between clinical units • Lack of time • High patient acuity • Negative nursing environment/patient safety issues

Initially, participants had some difficulty identifying factors that specifically impeded or enhanced their critical thinking and/or their ability to role

model it. Participants could more readily identify potential enhancers and barriers during the second phase of interviews, once they had more time to reflect on what factors impacted their critical thinking and their ability to reveal it to students in the clinical setting.

Discussion

Examination of the quantitative data revealed that the CCTST has undergone a change in scoring when compared to previously completed nurse educator studies from five years previous. The new version of the CCTST tool used for my study calculated the total and subscale scores out of 100, instead of scoring out of 34. The mean total score achieved by the five participants indicated moderate overall critical thinking skills. Individual participants scored in the 14^{th} to 50^{th} percentiles, compared to the norms for graduate students and health professional provided by Insight Assessment (2013a). Past studies (those using the earlier 34 point scale assessment versions) found that nurse educators had demonstrated strong critical thinking skills and scored above the previously published college level sample norms (Insight Assessment 2013a).

Results from my study indicate that some study participants achieved a lower overall mean score. The CCTST subscale scores in my study ranged from moderate (induction, deduction, evaluation, explanation) to strong overall skill level (analysis, inference, interpretation). Other researchers (Blondy, 2007; Raymond & Profetto-McGrath, 2005; Zygmont & Schaefer, 2006) have reported subscale scores varying from moderate to strong with some similarities in ranking of the subscale mean scores when compared to my study. More specifically, two

out of three studies (Blondy; Raymond & Profetto-McGrath) using the CCTST in the past ten years, when also using a nurse educator sample, reported strong critical thinking skills in the analysis subscale. The necessity for clinical decision making and incorporating multiple sources of information in nursing practice could explain the repeated higher scores in the analysis subscale. As well, Insight Assessment identified a link between interpretation and analysis subscales, both measuring strong in this study. The deduction and inference subscales have never been reported as strong in any of the nurse educator studies to date. Insight Assessment (2013a) described deduction as "decision making in precisely defined contexts where rules, operating conditions, core beliefs, values, policies, principles, procedures, and terminology completely determine the outcome…" (p. 15). Complex nursing contexts may not provide the necessary controlled environments congruent with how this skill is defined in the CCTST. Based on the definition of inference published by Insight Assessment (2013a), uncontrolled environments may not be conducive to producing the necessary hypotheses necessary with this skill. Although small in size, my study had a similar outcome. Unlike my research, previous studies have not reported interpretation and explanation subscale scores as was done in my research. Further research with this tool would be helpful for future subscale comparisons.

The CCTDI scores for my study indicated that the participants had an overall positive inclination to think critically. Compared with other studies assessing the dispositions of nurse educators, the mean total CCTDI score in this study ($\overline{x}$ = 331.92, SD=21.03) is similar to the two other studies completed by

Raymond and Profetto-McGrath (2005) and Profetto-McGrath et al. (2009) who reported total scores of 331.55 and 327.35 respectively. When I compared subscale scores in my findings to previous research, I found inquisitiveness and confidence have consistently ranked in the top three. Inquisitiveness has been the top scoring subscale to date in each study completed using nurse educator participants. Insight Assessment (2013b) described inquisitiveness as "intellectual curiosity" which is fueled by a desire to know things, whether pertinent in the moment or not (2013b). For comparison it would be interesting to measure how those in nursing who do not eagerly participate in research score on the CCTDI disposition subscales. I also found some similarities in the lowest subscale scores when compared to the earlier studies. All three studies had truth-seeking as one of the lower scoring subscales. Truth-seeking involves "always desiring the best possible understanding of any given situation" (Insight Assessment 2013b, p. 16). Possibly the ability to "face difficult ideas" (p. 16) and ask hard questions is not something nurses educators are more able to do. It is possible that the assessment scale does not accurately capture what truth-seeking means in a nursing context.

In my study, participants revealed their critical thinking within the clinical setting predominantly by role modeling dispositions and using questioning techniques. Cruess, Cruess, and Steinert (2008) outlined that role models demonstrate three important characteristics: clinical competence, teaching skills, and personal qualities. Similarly, my findings indicated that educators revealed their critical thinking by placing an emphasis on quality care, demonstrating

critical thinking dispositions, and using teaching strategies that role model critical thinking in the clinical setting. Donaldson and Carter (2005) reported that role models demonstrate both negative and positive behaviours that can directly influence the actions of any observers.

There were instances where educators did not consistently demonstrate critical thinking dispositions or use high level questioning techniques when they could have. High workload pressures, which increase educators' stress and fatigue, may have contributed to the inability to consistently demonstrate methods or dispositions conducive to critical thinking. Since students can learn from role models in conscious and unconscious ways (Cruess, Cruess, & Steinert, 2008), educators need to be aware of how they are role modeling critical thinking and other skills in the clinical setting. Whalen (2009) reported that clinical nurse educators often experience physical and emotional decline when dealing with the many reported stressors associated with their role. The source of these stresses included decreased monetary compensation, multiple role expectations, and working outside of regular work hours. Since the work situation for educators can be stressful and demanding of time, as well as physical and emotional well-being, role modeling and questioning may be less effective when educators are experiencing role stress.

Nurse educator participants frequently used questioning as a strategy to reveal their critical thinking. Although most educators used lower level questions focused on knowledge recall and application of information, they also used high level questions on several occasions. Many of the higher level questions nurse

educators asked were aimed at eliciting students' rationale behind their nursing care and their understanding of various intricacies found in the patient care context. Most of the higher level questions I observed in this study were at the analyzing or evaluating level of Bloom's Revised Taxonomy. In other studies examining nurse educators questioning skills, it was found that educators asked mainly lower level questions in classroom settings (Profetto-McGrath, Bulmer Smith, Day, & Yonge, 2004). Myrick and Yonge (2002) found that preceptors asked students predominantly lower level questions in the clinical setting. Although my study also demonstrated nurse educators' more prevalent use of lower level questions, there were many situations where lower level questions were needed to help the student incrementally think at a deeper level.

More than assessing the type or level of questions being asked, we should be investigating why educators are asking lower level questions, and evaluating what factors are impacting the questions they are posing (e.g., student cognitive level, topic, context). Interestingly, educators also encouraged students to ask their own questions, which appeared to promote a critical thinking culture of questioning. Nickitas (2012) emphasized that creating a culture of asking questions is an important critical thinking teaching strategy in the clinical setting.

After comparing both the quantitative and qualitative data provided by the small sample in my study, I determined that a clear connection between quantitative data and qualitative observations was not obvious. Nevertheless, I did find some similarities between individual educators' scores on the CCTST and CCTDI, and their respective observations. For example, I found that

educators who voiced strong tendencies towards reflection as part of their critical thinking had higher scores on the confidence in reasoning subscale of the CCTDI. The confidence in reasoning subscale is described as a "habitual tendency to trust reflective thinking" (p.16) which is demonstrated by the use of careful reasoning and reflection when making decisions (Insight Assessment, 2013b). It was also apparent from my observations that dispositions associated with the CCTDI were much easier to observe than the critical thinking skills associated with the CCTST. Interestingly, participants from my study initially voiced that they believed critical thinking skills were more visible than the associated dispositions. Similar to my findings, Scheffer (2000) identified that nurse educators had difficulty describing their own critical thinking and often confused the student's critical thinking with their own skills and dispositions. In the interviews I completed, nurse participants frequently referred to student examples of critical thinking when asked to give examples of their own critical thinking.

Limitations

My study was a beginning exploration of nurse educators' critical thinking in the clinical setting. The sample I obtained for this study was comprised of five nurse educators from one large Western Canadian baccalaureate nursing program, representing a very small percentage of the sampled population. The size of my sample limits the generalizability of the findings as does the convenience sampling method I used to recruit from one chosen nursing program. As well, I chose to use the California Critical Thinking Assessments, which may have generated different results compared to other tools. Another possible limitation of

my study is potential reactivity or the Hawthorne effect where participants acted differently because I was observing them.

Recommendations and Conclusions

My study was a beginning examination of the critical thinking skills and dispositions of nurse educators in the clinical setting. Participants in this study showed moderate to strong abilities and inclinations to think critically. How nurse educators revealed their critical thinking differed between individual participants, however, some similarities emerged, including using role modeling of critical thinking skills and dispositions, along with the use of questioning as a teaching strategy that showcased their abilities. Overall, I found that critical thinking dispositions were much more evident in the clinical setting compared to cognitive skills. In addition to the observations made of participants, the interviews I completed showed that both dispositions and skills were being employed to demonstrate how nurse educators thought critically in practice. Based on this study, I outline future recommendations for research is needed to:

1. Examine how nurse educators score on the CCTST and CCTDI compared with how they role model critical thinking in a variety of settings.
2. Compare and contrast results by replicating this study with larger samples.
3. Explore possible trends seen in nurse educators' scores on the CCTDI and CCTST. Further exploration of nurse educators' higher scores on the inquisitiveness and analysis subscales is warranted given similar results in other studies.

Nursing education practice may also be impacted by this research. Nurse educators need to be aware of ways to role model critical thinking to students in a variety of settings. Within the findings of my study, the participants found it difficult to verbalize how they revealed their critical thinking in the clinical setting. Most participants found it easier to provide examples demonstrating their students' critical thinking in learning interactions instead of exploring their own role in developing students' critical thinking. By the end of the study, all participants voiced that they were reflecting more and consciously using strategies to demonstrate critical thinking to their students. In order to continue to increase nurse educators' awareness of their critical thinking and ways to role model it, the following recommendations are offered:

1. Enhance nurse educators' practice through the use of reflection and engagement in ways that support their own critical thinking skills and dispositions and explore how these can be role modeled in the clinical setting.
2. Offer self-evaluation opportunities to nurse educators' who wish to increase their self-awareness by measuring their critical thinking through the administration of the California Critical Thinking assessment tools.
3. Offer faculty development opportunities in support of nurse educators' ongoing development and role modeling of critical skills and dispositions.
4. Engage in teaching and learning related research on critical thinking in order to support further understanding of this topic.

In conclusion, nurse educators play an integral role in the development of students' critical thinking (Mundy & Denham, 2008). More specifically, educators can stimulate students' critical thinking through role modeling, questioning and inspiring curiosity (Potgieter, 2012). Role modeling and questioning are two ways nurse educator participants in my study predominantly revealed their critical thinking. Based on interviews and observation data, nurse educators demonstrated their own critical thinking in action by role modeling critical thinking skills and dispositions, as well as the use of selected teaching techniques, such as questioning. From the assessment tools administered in my study, participants demonstrated moderate CCTST scores and a positive inclination to think critically as measured by the CCTDI. There were many internal and external factors that impacted nurse educator participants' critical thinking and abilities to externalize it in the clinical setting. Although this study has provided a glimpse of nurse educators' critical thinking, replication and comparison is warranted to further illuminate the intricate ways nurse educators' critical thinking can be mobilized.

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Chapter Five

Paper 3: Balancing the Discernible and Indiscernible- An Interconnected Journey Defining Nurse Educators' Critical Thinking

An important goal of nursing education is to foster students' critical thinking. It is widely held that nurse educators' critical thinking is an important factor in the development of students' critical thinking yet significant questions still exist, including "How do nurse educators utilize their own critical thinking in learning interactions with students?" Clinical settings are one of many contexts where student learning occurs, providing a rich opportunity for experiential learning where critical thinking can be utilized. One unexplored aspect of experiential learning is the role of nurse educators' critical thinking within the clinical practice setting. When using a grounded theory approach to explore how nurse educators revealed their critical thinking in the clinical setting, a model emerged from the data. The model I present in this paper exemplifies one interpretation of how nurse educators reveal their critical thinking.

Review of Pertinent Literature

Critical thinking has been defined in multiple ways, yet for some it remains an elusive concept not clearly understood in nursing (Mundy & Denham, 2008; Riddell, 2007). Walsh and Seldomridge (2006) asserted, "critical thinking is not one, monolithic thing" (p. 216). For that reason, capturing the essence of what it means to think critically requires in-depth exploration. More specifically, nurse educators' critical thinking, and the social and contextual factors that impact

how they experience it, should be examined if we are to better understand the intricacy of critical thinking in nursing education.

How nurse educators reveal their critical thinking impacts how critical thinking is facilitated in nursing education. One way to demonstrate a nursing skill is through modeling it. Role modeling is thought to be a valuable teaching strategy that educators can use to foster students' critical thinking in the clinical setting (Brookfield, 2012; Myrick, 2002; Profetto-McGrath, 2005). Brookfield believes that modeling critical thought is also considered a moral responsibility of the educator. If educators expect students to be evaluated on how well they demonstrate critical thinking, it is imperative that educators also engage in critical thinking to gain insight into the student perspective, and to demonstrate the reciprocal responsibility of thinking critically in practice. The majority of the quantitative exploratory studies investigating critical thinking in nursing education have focused on measuring students' critical thinking. More needs to be known about how critical thinking develops and is demonstrated by nurse educators to understand more adequately the multifaceted process of fostering students' critical thinking.

Gaps in the research literature reveal that nurse educators' critical thinking has not been well explored despite educators' belief that it plays an integral role in fostering the development of students' critical thinking (Mundy & Denham, 2008). Researchers exploring critical thinking in nursing education have focused mainly on students. Despite the findings in some studies that reveal nurse educators have a moderately high inclination to think critically (Profetto-

McGrath, Bulmer Smith, Hugo, Patel, & Dussault, 2009; Raymond & Profetto-McGrath, 2005), nurse educators' critical thinking has also been found to be highly variable (Zygmont & Schaefer, 2006). The literature shows that quantitative approaches have been used in tandem with qualitative research to study critical thinking in nursing education (Brunt, 2005). More specifically, in this topic area four quantitative studies, four qualitative studies, and two studies that used mixed data collection methods have been published since 2000 (Raymond, Profetto-McGrath, Myrick, & Strean, 2014a).

Few authors have discussed factors that impact critical thinking in nursing education; even fewer have addressed the specific factors influencing nurse educators' critical thought. Mangena and Chabeli (2005), as well as Shell (2001) explored barriers to critical thinking in nursing education. Shell found that the main barriers to critical thinking, as reported by nurse educators, included negative student characteristics, time constraints on faculty development and class time, as well as the need to cover large amounts of content in class. Mangena and Chabeli concluded that barriers to critical thinking included the educators' lack of knowledge regarding teaching methods and evaluation that could foster critical thinking; negative attitudes of faculty members; and student selection and socialization issues. Both of the above studies focused on barriers associated with the nursing education process and the outcome of students' critical thinking. Raymond and Profetto-McGrath (2005) identified internal (i.e., within the educator) and external factors (i.e., inter-relational and contextual) that influenced nurse educators' critical thinking. These factors comprised both enhancers and

barriers to elements such as physical-mental well-being, leadership view on critical thinking, and collegial relationships that educators encountered within their context. From the limited literature outlining factors that impact critical thinking, it is evident that each author has examined barriers and facilitators to critical thinking from a slightly different perspective. For example, Shell focused on barriers to student development of critical thinking while Mangena and Chabeli examined barriers and enhancers to the educational process in which students are expected to learn to think critically. Raymond and Profetto-McGrath specifically examined nurse educators' critical thinking. Although similar barriers and facilitators were evident in all three studies, it is important to note the afore-mentioned differences in each study's focus because they emphasize the sometimes incongruent nature of literature in this topic area. Due in part to gaps in the literature and the limited research completed to date, many questions remain regarding nurse educators' critical thinking.

Questions

The purpose of this study was to explore and ascertain nurse educators' critical thinking in practice. More specifically, the research questions directly related to the development of the model were:

1. How is critical thinking revealed by nurse educators in the clinical setting?
    a. What aspects of nurse educators' critical thinking are evident in the practice setting?
    b. How do nurse educators describe the ways in which they reveal critical thinking in the practice setting?

2. What facilitators and barriers impact nurse educators' critical thinking skills and/or dispositions in practice? How so?

Method

This study was part of a larger triangulated mixed methods study that incorporated demographic information and the scores from two critical thinking assessment tools, which is discussed elsewhere (Raymond-Seniuk, Profetto-McGrath, Myrick, & Strean, 2014b). A constructivist grounded theory approach, as described by Charmaz (2006), was used for the qualitative phase of the research. In this type of grounded theory, shared experiences between the researcher and participant co-created the data. This approach did not emphasize the illumination of one core category as found in traditional or objectivist grounded theory developed by Strauss and Corbin (1998). Creswell (2007) identified that grounded theory works well when there is a need to study a group of individuals in order to achieve a detailed understanding where context and setting are important factors in the process being examined. As well, Richards and Morse (2007) stated that exploring a changing or shifting phenomenon would benefit from using grounded theory. Charmaz (2006) added that "constructivists study how, and sometimes why" (p.30), which fits well with an inquiry into how and why critical thinking exists. The use of grounded theory helped me to uncover a deeper understanding of critical thinking, the related characteristics, conditions, consequences and antecedents from the perspective of nurse educators in practice. Furthermore, a constructivist grounded theory approach to gather the

data through interactions with the participants led to a theoretical representation of the critical thinking process.

Semi-structured interviews and participant observation in the clinical setting were the data collection methods used to support the model described in this article. Each participant completed a minimum of three days/shifts of clinical observation and two interviews. Participant observation informed the social practice aspect of each participant's critical thinking (Moore & Savage, 2002). Bosk (1985) eloquently stated:

> Fieldwork supplies precisely what other methods of research drop out – the experiencing individual as a member of a community and the set of shared meanings that sustains that individual's actions in an uncertain world. Fieldwork allows us to see social life as we live it (p. 14).

My role as researcher was observer as participant given the setting and my familiarity with the nurse educator role. The observations all occurred in acute care settings, which made the study more pragmatically manageable and the potential to compare participants easier to complete, had more nurse educators participated. Given the small number of participants, a similar location for all of the observations was an important common variable within the data collected. Considering my familiarity with the practice setting where observations occurred, I was also diligent about monitoring the effects of my previous experience as a nurse educator on my observations. Robertson (1982) pointed out the need for researchers to monitor for effects of their presence upon the observations, such as distorted perceptions, disruptive effects, and effects of familiarity. As the

researcher, I was vigilant in monitoring for any disruptive effects my presence had for participants during the data collection process and captured these thoughts through reflective journaling. In order to encapsulate the observations and the richness of the data, I also wrote brief field notes during the observations and recorded more analytical and comprehensive thoughts immediately after each session with the participants.

I conducted two semi-structured interviews with each participant. First, an initial interview was conducted shortly after I observed each educator participant in the clinical setting. I posed a list of open-ended questions to participants during this interview. These questions focused on defining critical thinking, exploring attributes of critical thinking in the clinical setting, understanding how educators revealed critical thinking in the clinical setting, identifying resources associated with nurse educators' critical thinking, and ascertaining factors that influenced educators' critical thinking. The initial interviews also clarified observed behaviours derived during the participant observations. This clarification was used to ensure that my interpretations of each educator's actions were correct.

The second set of semi-structured interviews occurred four to six months after the completion of the initial observation phase and the first interview. The period of time between the first and second set of interviews allowed, in part, for analysis of the data collected from participant observations and the first interviews. After determining that more data were needed, I scheduled second interviews with each participant. The time lapse between the first and second set

of interviews was helpful in that it offered participants extra time to reflect on how they revealed their critical thinking in the clinical setting. Prior to the second interview, I sent out individually tailored questions, as well as critical thinking definitions, to give participants time to consider their responses to some of the questions that would be asked. Questions for the second interview focused on clarifying the ways each nurse educator revealed, reflected on, and fostered their own critical thinking. I digitally recorded all interviews and a transcriptionist transcribed them verbatim. I then checked all transcripts for accuracy.

I chose a semi-structured interview format based on my previous knowledge about the topic and my ability to create meaningful questions in advance of the interviews (Richards & Morse, 2007). Creating some of the interview questions in advance fostered my organization and allowed me to focus on interview techniques when interacting with participants (Richards & Morse). To ensure participants' answers were detailed and comprehensive, I also used probing during both interviews as needed to allow me to gain a deep understanding of each nurse educator's perception of their own critical thinking.

Using interviews in conjunction with observation added an element of triangulation, as did member checking, which was used to confirm whether the interpretations of my field notes were similar to participants' perceptions of the same events. Another strategy I used to clarify my perceptions as researcher was through reflective writing. Jasper (2005) considered reflective writing sources as a type of data obtained from the study that can aid in connecting and relating ideas and thoughts. As a researcher I was an instrument of data collection during

the interviews and observations, as well as gathering my own perceptions, which were recorded in memos and journal entries. In this study, I used reflective writing to capture my ideas and thought processes in order to eliminate distractions and create an open space to allow theoretical concepts and structures to emerge. For example, my thoughts as to how the study was progressing, how contact with the research participants was unfolding, and how I struggled to recruit research participants, were some topics captured in a reflective journal that served to give contextual understanding to events occurring throughout the study. I was able to verbalize and examine my assumptions and values as data were generated. This helped to ensure that I was staying true to the data as opposed to allowing my personal perspectives to influence data analysis. The use of reflective writing in this study was also important given my limited experience using qualitative inquiry. Reflective writing provided an anecdotal audit trail of my thoughts and decisions as the research process unfolded.

Analysis and Model Development

Data analysis for this grounded theory study started as soon as recruitment was initiated and continued throughout the research process. I created analytic files as supplemental data were generated throughout the research (Creswell, 2007). Supplemental data included information that informed the contextual realm of the study, as well as quotations and emergent ideas gathered from various sources (Glesne, 2006). For example, emails about a physical office move for the nursing faculty were kept as a reminder of an event that occurred during participant recruitment and data collection activities. Reflective journaling

was also started at the onset of the study to capture my thoughts, beliefs, assumptions, and reactions about the research as it unfolded. Questions such as "How can I ensure I am accurately representing the data when I myself am a nurse educator?" were recorded in my reflective journal along with thoughts on how I could best answer this question.

Coding was a significant analytic tool in my research. I initiated line by line coding as soon as each interview transcript or set of field notes with the accompanying analytic record were available. I used phrases in the form of actions and processes to describe the data being analyzed in order to mine the data for potential theoretical meaning (Charmaz, 1995). This approach allowed me to elucidate implicit processes and keep the analysis active and emergent (Charmaz, 2011). Charmaz (2011) also outlined the need to code within the boxes of the transcripts or observation notes to maintain a "precise handle on the material" (p. 369) and identify points requiring further illumination. From the initial line by line or open coding, 76 themes emerged from the data. Originally, 60 themes were developed from the observational data (field and analytical notes) and 80 from the interview transcripts. When all of the themes were combined and reviewed for repetition, 76 themes were evident. Some of these codes included phrases such as "making links and connecting pieces of information", "admitting faults in their thinking", and "embracing diversity and multiple perspectives."

I used focused coding after the initial line by line coding to establish the overriding and conceptual categories produced from the data (Charmaz, 2011). Once themes started to emerge, focused coding helped to reduce the data to

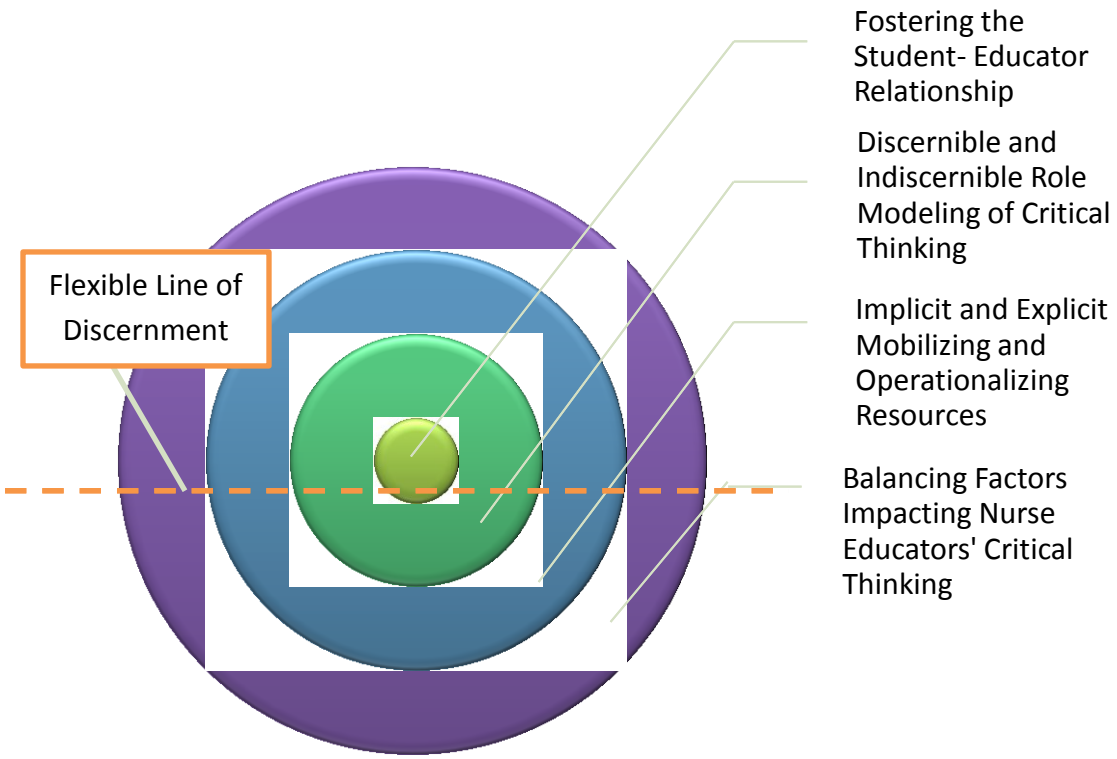
manageable portions for further analysis (Creswell, 2007). The categories that emerged were taken from recurring codes found in the data. These focused codes were then used to sift through the data and hone the titles of the categories as the meanings of each became clearer. Categories were constantly refined as data were revisited and became more explicit. I created four main categories from the focused coding procedures. These categories included: a) fostering the student-educator relationship, b) discernible and indiscernible role modeling of critical thinking, c) explicit and implicit mobilizing and operationalizing resources, and d) balancing factors impacting nurse educators' critical thinking.

Once I categorized the codes, memos were used to record more intricate details for the categories, such as properties, conditions, consequences, and linkages to other categories. I implemented memoing in my study to break down the categories into their components (Charmaz,1995). Holton (2010) added that memoing entails conceptualizing the data to a theoretical level through the researcher's comparison of the data. Memoing was used concurrently with coding and helped to refine the categories by adding further detail (Charmaz). Memos in my research also included some overarching thoughts on how the data were connected. An example is the consistent implicit-explicit or discernible-indiscernible interplay of the educators' actions. In addition, memoing was also helpful to analyze the language I used to describe the data, another important step in examining the inquiry process (Glesne, 2006).

I utilized constant comparative analysis throughout the coding procedures to obtain various levels of abstraction in the identified themes and categories

(Charmaz, 2006). More specifically, I compared data from each participant with data from other participants, as well as to the emerging categories. In addition, I compared all data sources collected during the research (including reflective writing and analytic files) to the categories to detect any incongruence and to add further depth to the categorical description. I achieved saturation in this study at the point when no new data was evident and a conceptual density was reached in the resultant categories (Holton, 2010). After I reached saturation, the main categories were combined to develop a diagram and create theoretical constructs to represent how nurse educators revealed their critical thinking. The data analysis gave rise to the following visual model.

Figure 3: MODEL- Nurse Educators' Critical Thinking: Balancing the Discernible and Indiscernible Along an Interconnected Journey.



Findings and Discussion

The findings from this study led me to construct a visual representation of interrelated aspects explaining how nurse educators reveal/model critical thinking in the clinical setting. Each part of the model is described and discussed below.

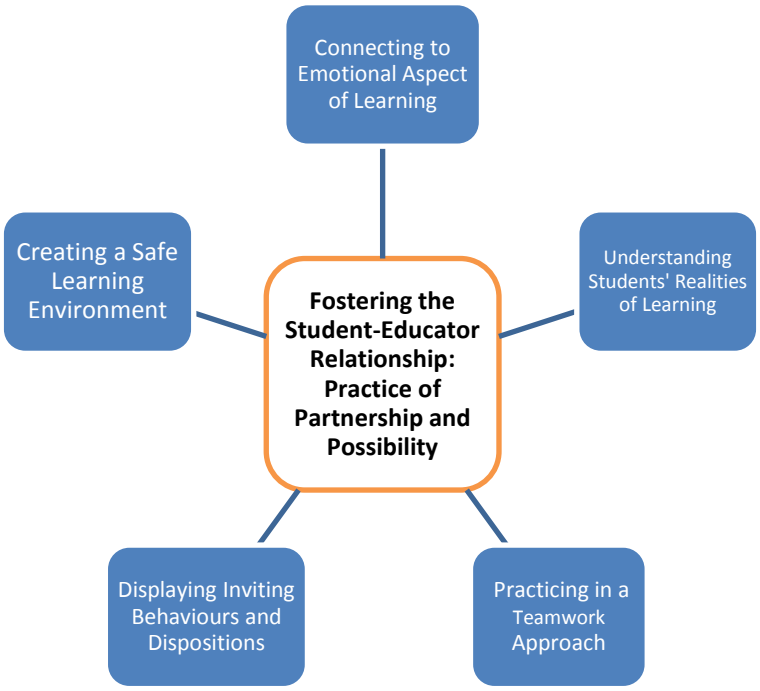
Flexible line of discernment. From the observation and interview data there was an overriding ebb and flow related to the visibility and invisibility of the themes contained in each category, which included: a) fostering the student-educator relationship; b) discernible and indiscernible role modeling of critical thinking; c) implicit and explicit mobilizing and operationalizing of resources; and d) balancing impacting factors impacting nurse educators' critical thinking. Elements within each of the four categories were not always visible and sometimes not in the conscious realm of the educator participant. The analogy of an iceberg appeared to define the many elements sometimes lingering below the surface of recognition but easily brought to the surface of the line of sight, or line of discernment, when educators were asked to reflect further. The line of discernment inhered a flexible quality, changing as factors related to the participant and the context changed.

Fostering the student-educator relationship: Practice of partnership and possibility. At the core of the model is the student-educator connection and relationship. This aspect of the model represents the interconnected nature of critical thinking and the emphasis on interpersonal relationships as captured by the data. It also points to a need for educators to foster a partnership with students that serves to form a critical foundation necessary for educators to reveal their

critical thinking in the clinical setting. It was evident that educators found it easier to share their critical thinking when students were receptive to learning. Educators demonstrated and talked less about their thinking when the relationship with the student appeared strained or negative (e.g., when the educator expressed an issue with the student's performance). It was also noted that the educator-student connection grew stronger in circumstances where clinical staff were receptive to students. A situation where this was exemplified was when one nurse educator participant entered the back room of the clinical unit and was observed noticing one of the students frantically trying to look through a patient chart prior to the start of shift. The educator approached the student calmly and asked, "what can I do to help?" The student replied with tears in her eyes, "I don't know what I need to know." The educator found a quiet location on the unit and engaged the student in a calm conversation, emphasizing the student's strengths and previously learned skills. The educator also asked the student how she felt she could mobilize those strengths to gather the information needed to care for the patient(s). Through a series of purposefully placed questions delivered by the educator in a timely and non-threatening manner, the student was able to express confidence in her ability to seek out what she did not know. A staff nurse joined their dyad and offered words of encouragement, as well as a few suggestions for gathering information for patient care. The student left the discussion smiling, voicing her excitement to gather appropriate patient care data, and appearing more relaxed.

Given the experiential nature of the acute care clinical settings in which the observations for this research took place, many opportunities for educators and students to connect with each other were evident. Educator participants' actions formulated key themes which represented a positive student-educator relationship conducive to learning. These themes are illustrated in Figure 4 and include: a) connecting to the emotional aspect of each student's learning, b) understanding each student's reality, c) practicing in a teamwork approach, d) displaying inviting behaviours and dispositions, and e) creating a safe learning environment.

Figure 4: Fostering the Student-Educator Relationship- A Practice of Partnership and Possibility



This centre or core of the model appears to form a foundation for the process involved in how nurse educators' revealed their critical thinking in the clinical setting. These findings offer insights into creating safe spaces and environments that foster the educators' and the students' critical thinking. The practice of possibility inherent in fostering a student–educator relationship speaks to the potential for significant reciprocal learning that such an exchange can create. The interpersonal nature of critical thinking is not new in the literature; however the importance of an educator's ability to form connections with students to share their critical thinking has not been discussed in any literature I have reviewed. In the findings from my study, creating an environment of trust, respect, and reciprocity appeared to represent a critical element in the ability for educator participants to reveal their critical thinking in the clinical setting. I discuss each of the five themes below and explore the available literature related to each one.

Of the five themes comprising the student-educator relationship category of the model, I found that connecting to the emotional nature of students' learning underscored all of the participant observations. Moreover, each research participant displayed behaviours that emphasized the importance of connecting with students as a starting point to being able to share their critical thinking. For example, in conversations with participants during observational periods, educators voiced awareness as to how students were coping with the clinical experience, and often posed questions to students about their emotional well-being. As well, nurse educators voiced a desire to show their humanness and

compassion to the students, which was congruent with the observable actions of the majority of participants. For example, one nurse educator participant greeted each student prior to the start of each shift. During these interactions the educator offered supportive reassurance, non-threatening reminders about patient care modalities, and followed up with those students who experienced a significant event, such as illness or a significant patient care event on a prior shift. Educators demonstrated a variety of little actions that showcased their ability to connect emotionally with students, including revealing their humanness and fostering their understanding of each individual student through individualized support. One participant stated that connecting with students and sharing her critical thinking meant "just doing that little extra so that they see you as an authentic human being." When reflecting on how nurse educators interacted with students, one participant captured the relational humanness of the relationship by stating, "I think most of it really just comes down to … being a person…you need to treat people the way you would want to be treated in whatever situation that presents itself…trying to guess what they [students] need and then checking."

Another way participants appeared to connect with the emotional aspect of learning was through trust building with students. Brookfield (1990) emphasized that trust is the "affective glue binding relationships together" (p. 163). Educators in my study demonstrated trust for students and displayed genuine concern for their individual learning experiences as evident through their comments and actions during the observations. As one participant stated, "sometimes it's just that trust building" that enables one to authentically connect with students. Trust

building was demonstrated by educators through verbal acts such as offering kind supportive words when students were struggling with their patient assignments or encountering tough patient situations. One participant demonstrated trust building when she approached a student in the medication preparation room to help prepare a parenteral injection for patient administration. Throughout the interaction the educator offered kind words such as, "you did that very well!" and helped correct any potential errors by allowing the student to identify these before intervening. This approach allowed the student to learn without feeling belittled when errors occurred, as well as feel supported and valued by the nurse educator. Educator participants also used non-verbal means such as direct eye contact and active listening to build trust.

Potgieter (2012) believes that educators need to foster trust and mutual respect with students in the clinical setting in order for students to feel safe to explore, learn and question what is going on around them. Brookfield (1987) also emphasized the role of trust in learning interactions when fostering students' critical thinking. He added that authenticity is linked with trust and is demonstrated by educators when their actions and words are congruent, they admit fallibility, they listen intently, and they demonstrate a realness beyond what their role as an educator requires. These elements represent a necessary relational competence and were evident collectively in the interviews and observations in my study. When asked how they reveal their critical thinking in the clinical setting one participant eloquently stated that "it all comes down to the journey

together [with students]…" for without students, there is no one with whom to share the educator's critical thinking.

The second aspect of the student-educator connection was the educator's role in becoming familiar with each student's reality in the learning environment in order to form the meaningful connection necessary to promote an effective learning relationship. More specifically, educators who demonstrated empathy and were genuinely interested in each student as a person were more likely to establish a positive student-educator relationship, one that enabled the educator to engage in learning interactions where critical thinking could be role modeled. As one research participant stated, "it's that personal human connection and I think that you're able to relate to the person on a better level when they know a little about you and you know a little about them, and they're not just a stranger, a student and a teacher." One of the behaviours indicative of educators' *understanding of a student's reality of learning* included informal comments nurse educators made regarding how much they valued the uniqueness of each student. As well, educators displayed an earnest desire to know how students' personal lives affected their learning so they could better address how students needed to learn. This process was demonstrated when one participant approached a student at the start of the shift to relay constructive comments regarding missed documentation expressed by a substitute clinical instructor who had worked with the students when the educator participant had been ill the previous shift. Before the comments were relayed, the educator asked the student how she was doing and how a previous issue with the student's home situation was impacting her

practice. The educator also acknowledged that she would like to monitor the student's stress level and asked the student to let her know if she was feeling overwhelmed with her patient assignment. After spending time with each educator it became clear to me that they had a sincere desire to understand each student's reality with the goal of ensuring they were engaging in a process that would support every student as much as possible. Each educator appeared to adapt her approach based on her assessment of what each every student needed and through an understanding of every student's different context or reality.

Third, educators connected with students by focusing on teamwork in the learning environment. An inherent *we* approach was evident when students and educators were actual partners in the learning interactions (in contrast to the educator as expert and the student as the passive learner). As one participant stated, "if they don't know something, it's okay if they don't know it. We need to figure out what they don't know and why it's important that they actually know that…" Educators also enacted a teamwork approach by providing patient care alongside or with the students. Although I was only privy to conversations outside patient rooms, educators were seen gathering information with the student and reassuring students that they were there to assist them with the care they were expected to provide. For example, one nurse educator added another patient to a student's patient workload for the shift. The student voiced that she was excited to care for another patient but apprehensive because of the additional patient's unfamiliar diagnosis. The nurse educator listened intently to the student's concerns and paraphrased back to the student the excitement and anxiety she had

voiced. After paraphrasing the student's message, the educator offered to help the student admit the patient to the unit and to be available as a resource so the student did not miss the valuable learning opportunity. The student smiled and voiced that this was a wonderful solution. An inherent teamwork approach was also evident in the manner in which the educators fielded staff concerns about students. For example, the educator was non-blaming when discussing the student's concern and displayed a willingness to engage collaboratively to reach a solution. Educators also learned from students' knowledge as evident in the following comment:

> I want students to respect me for the knowledge I have, but it's also a two-way street… yes I'm in charge of giving them a mark ultimately in the end, but it's teamwork to get there …I treat them as peers not as strictly students. They have lots of knowledge I don't have. They spend more time researching everything….So I think it's a teamwork thing.

Fourth, educators displayed relational dispositions such as genuineness and kindness, which promoted a positive learning environment. Educators who demonstrated warmth, caring, and concern towards students using positive non-verbal actions (e.g., smiling and eye contact) appeared to generate stronger student-educator connections. Educators promoted a real-ness in their relationship with students by displaying a natural comfort with the educator role. This was evidenced by verbal accounts emphasizing the educators' comfort with the role, as well as appearing not to display stress while dealing with the complexity and ongoing demands of an educator's responsibilities. One

participant exhibited her overall comfort in the educator role by consistently demonstrating calm verbal and non-verbal communication with everyone around her. This approach was apparent even in times where there was a palpable stress on the unit given patient acuity and the short staffing that had taxed the staff nurses enough for them to appear visibly stressed. One student even approached the educator and commented on her overall calmness. The educator replied "there is no sense getting excited, that won't help anyone." Overall, educators who demonstrated more inviting behaviours were more readily and frequently approached by students. These apparent strong connections were demonstrated by more numerous and comfortable interactions, more smiling on the part of the educator when speaking with each student, and a more collegial quality to student-educator communication. There was an absence of tension between the educator and the student when educators displayed these inviting dispositions. My observations that indicated collegiality and an ease between the educator and student included the mutual use of humor; frequent smiling by the educator and student when interacting; and relaxed facial expressions on the faces of both the educator and student.

Participants in my research used their interpersonal skills to create and sustain quality relationships with students. Alfaro-Lefevre (2012) identified the importance of interpersonal skills as part of demonstrating one's critical thinking abilities. Educators in my study displayed genuine and authentic actions, as well as sensitivity and patience for diversity, which were some of Alfaro-Lefevre's specific indicators. I found genuineness and authenticity to be supported by

educator participants who demonstrated a consistency between their stated beliefs or values and their actions. Alfaro-Lefevre believes that if educators display the critical thinking indicators, they can establish an empowered partnership and promote a safe learning culture (Alfaro-LeFevre). Myrick (2002) and Myrick and Yonge (2004) outlined the importance of a "relational process" involving students and preceptors. In their study, preceptor behaviours were pivotal to students' critical thinking and the success of the preceptorship experience. It was evident that the relationship between educators and students in my research greatly impacted the instances where educators shared their critical thinking. Overall, there are various authors who emphasize the importance of positive relationships between educators and students to achieve desirable outcomes (Gillespie, 2005; Myrick, 2002; Myrick & Yonge, 2004; Potgieter, 2012). To date, no other studies have examined the importance of nurse educators' interpersonal skills and their ability to think critically and share it with students.

Fifth, educators appeared to foster a positive student–educator connection by creating a safe learning environment. This process was demonstrated by one educator participant when she was approached by a student who admitted making an error administering medication. The educator first listened to what the student was saying. The educator then sat with the student and asked a number of critical questions to ensure the patient was safe from immediate danger. The rationale for asking these questions was provided to the student so they would not perceive the educator's questions as judgmental. When the student began to cry, the educator placed her hand on the student's shoulder and acknowledged how difficult it is

when one makes errors in practice. The educator also commended the student for coming to her and having the courage to engage in a difficult discussion about the error she had made. The educator then shared her personal accounts of making errors in practice. The student hugged the educator at the end of the discussion. Through these types of interactions, educators created safe learning environments where students learned and were respected for engaging in difficult discussions that occur in clinical practice.

Students appeared to feel comfortable in asking questions when educators themselves were asking questions about what was occurring in the clinical setting. For example, one educator participant relayed her concern about the dispensing and monitoring of liquid narcotics on the unit. More specifically, measurements of pre- and post-dose liquid narcotics were being recorded as estimates instead of actual amounts. This common practice creates a liability issue for the nurse dispensing the medication and recording the remaining amounts. The educator in my study wanted to understand how this common practice affected her personal liability as a nurse. The student in this example openly stated that she had never thought of it that way and would look more closely the next time she administered a liquid narcotic. Evident in my observations, educators created a safe environment by providing realistic and accurate reassurance to students, and by offering positive affirmations to students about their practice on a regular basis. Educator participants offered positive and constructive feedback to students in a non-threatening manner, potentially mitigating the intimidating nature of the feedback.

Ultimately my research depicts the student-educator relationship as a *place of possibility* where educators transform the learning space to facilitate reciprocal growth on the part of the student and educator (Gillespie, 2005). Myrick and Tamlyn (2007) emphasized the need for a purposeful and authentic connection with students to facilitate an emancipatory approach to nursing education where educators do not act as if they are in power positions, which can be perceived as controlling students and dictating their learning experience. Educator participants in my study engaged in the purposeful creation of a student-educator connection, demonstrating key elements of respect, trust, understanding and teamwork, in order to create a space where they could role model their critical thinking. This *place of possibility* was evident by the ease in which the educator heard, respected, and saw beyond the *external veneer* of the student (Gillespie). Participants appeared to create a trusting and connected space with students where mutual knowledge sharing was coupled with a genuine sense of reciprocal learning. As one participant stated "...it must be interesting for them [students] too, when they've done so much work and they can actually teach us things…. We can't know everything."

Discernible and Indiscernible Role Modeling of Critical Thinking. The next interacting element of the emerging model was the discernible and indiscernible thoughts, actions, and behaviours of nurse educators as they role modeled critical thinking. The following figure outlines the perceptible and imperceptible elements indicative of critical thinking that were identified during the observation and interview portions of this study. Each discernible action was

observed numerous times in the majority of the participants. The indiscernible methods nurse educators believed they used to role model critical thinking were identified by participants through conversations while I was observing them and/or during the interviews.

Figure 5: Discernible and Indiscernible Role Modeling of Critical Thinking

Discernible Aspects of Nurse Educators' Critical Thinking	**Indiscernible Aspects of Nurse Educators' Critical Thinking**
Questioning • Uses various levels of questions based on situation and student • Asks "why" questions to understand students' decisions regarding patient care and care planning • Follows up with students, seeks them out for clarification based on previous interactions • Sparks interest in others to ask their own questions by demonstrating curiosity in the clinical setting (e.g., posing questions and wondering out loud)	*Assesses and Reflects Upon Each Student's:* • knowledge level • nursing skills such as psychomotor, communication, thinking, and caring • affective state and receptivity to learning
Displays Dispositions Associated with Critical Thinking: • Humility about personal gaps in thinking • Approachability and openness • Ability to embrace diversity	*Assesses and Reflects Upon Own:* • ability to effectively engage and connect with student • communication skills and interactions (verbal and non-verbal communication)

• Genuine and inherent sense of curiosity • Flexible and able to accommodate differences in staff and students	• thinking abilities, including possible flaws in thinking • Flexibility to student needs and learning styles
Teaches and Tailors • Thinks aloud–gives cues, hints, prioritizes, predicts, connects, coaches • Shows knowledge application to nursing practice – strongly adheres to and demonstrates quality care principles, uses precise language in the clinical setting, practices a collaboratively with other health professionals, is a strong patient advocate, and seeks help from the health care team • Mobilizes resources available in the context • Enables group engagement in problem solving when effective and appropriate • Applies appropriate resources and engages in collaborative problem solving	*Assesses and Reflects Upon Environment / Context* • Influential factors such as staff dynamics, acuity of patients in the setting, and staff receptiveness to students

Role modeling was the prominent discernible method nurse educator participants used to reveal their critical thinking when interacting with students.

Nurse educators visibly role modeled their critical thinking by using various levels of questioning, displaying facilitative dispositions associated with critical thinking, and using a few key teaching methods to demonstrate how thinking could be applied to nursing practice. Some of the key teaching methods included explaining their thinking out loud with the students, participating in care, and illustrating how nursing knowledge is specifically applied by reviewing, selecting and analyzing resources needed to make clinical decisions. The participants' style of role modeling critical thinking reflected the individual dispositions displayed by the educators and was slightly different based on alterations in students' differing learning styles. Educator participants more commonly demonstrated the dispositions of humility, approachability, curiosity, and openness, which are some of the dispositions associated with critical thinking (Facione, 1990). Only dispositions that aided in the educator's ability to share their critical thinking were included as methods of role modeling in the developed model.

Brookfield (1990) commented that openness is difficult for educators to demonstrate. An example of demonstrating openness was evident when one nurse educator participant was approached by a student who had found some new information in an article about a new dressing change technique. The student noted that the article suggested a different practice than she had been taught or that she was instructed to use on the unit. The student wanted to implement the new research findings into her practice but was not sure whether that would be acceptable to other unit staff. The educator listened intently to the student's suggestions, showed excitement in response to the student's curiosity, and found a

quiet place to discuss in greater depth the possible change in the student's practice. During this discussion with the student, the educator raised many questions and asked the student for a verbal evaluation of the source as well as the information. At the end of the discussion the educator encouraged the student to follow up with the other nurses and charge nurse on the unit about implementing the suggested change in practice for the student's assigned patient. The nonjudgmental nature of the educator's tone and content of her questions to the student displayed her openness to what the student was suggesting. In addition, the educator guided the student to a deeper level of thinking by asking her to evaluate the information contained in the article.

Many authors have highlighted the importance of role modeling as a valuable teaching method that promotes the development of critical thinking (Brookfield, 1990; Donaldson & Carter, 2005; Perry, 2009). Its importance in nursing education is also included in the literature (Donaldson & Carter, 2005; Hayajneh, 2011; Illingworth, 2009; Myrick, 2002; Perry, 2009). For example, Myrick (2002) identified that nurse educators play a crucial role in developing students' critical thinking by role modeling, facilitating, guiding, and prioritizing in the clinical setting. Illingworth found that humanism, which he defined as the desire to improve oneself while demonstrating respect and understanding of another, underpinned role modeling in his study. Humanism, as a theme identified by Illingworth, was not directly linked to role modeling in my study but it did serve as a foundational element in forming the necessary student-educator relationship that made role modeling possible for educator participants.

Interestingly, when asked in the initial interview most participants in my study were not aware how they role modeled critical thinking in the clinical setting. As one participant stated, "It is [hard] because I don't pay attention to what I do." Another participant added, "I didn't think a lot about critical thinking before." I heard these comments multiple times during data collection. After the second interview, participants displayed more awareness of their actions and how these actions were connected to their own critical thinking. More specifically, participants identified some of their personal and interpersonal qualities associated with role modeling. For example, many participants identified that inquisitiveness was needed to foster students' curiosity in the clinical setting. One participant felt she demonstrated inquisitiveness "in general [by] being interested and engaging; …what sparks your interest may spark someone else's as well." As one participant explained, there is also a connection between the student-educator relationship and the content of what is modeled by the nurse educator. She stated "I think I've modeled my practice on just being real with people and students." Authenticity was one of many desirable educator qualities found in my research and emphasized in the literature.

Many of the same personal and interpersonal qualities related to effective role modeling as described in the literature are evident in my findings. Participants voiced the need to be strong practitioners, effective educators, and caring individuals, all of which are important antecedents to role modeling critical thinking. In contrast, previous literature included either student or staff accounts of what good role modeling looks like or role modeling for the purpose of

facilitating student outcomes such as critical thinking. That is, previous literature has explored role modeling as a technique to promote an educational outcome whereas my findings emphasize role modeling as a vehicle for educators to share their ability to think critically. Cruess, Cruess, and Steinert (2008) commented that effective role models need to be self-aware of how they role model, an attribute not initially found in my study but which became clearer to participants after the second interview.

My study revealed how nurse educators used teaching strategies to express their thinking and tailored them according to what worked best for each student's reality. Educator participants thought out loud for their students and walked them through how they could approach specific clinical situations using critical thinking. Educators also voiced their use of different strategies to engage students while thinking out loud, such as "taking them [students] all the way back. I think a big thing is just slowing them down, helping them take it apart" and "giving them cues more than anything… than provide them with actual information, if I can help it." One example of how a participant demonstrated thinking out loud was when a student requested that the educator be present when she was completing a new skill. The educator asked the student what information was needed prior to implementing the new patient orders. The student appeared confused by the educator's question. The educator tried to rephrase the question but the student voiced her ongoing uncertainty. The educator then started to review all the impacting factors (including the educator's own beliefs and assumptions about the skill) that needed to be considered prior to completing the

skill by thinking out loud about it in a methodical fashion. The educator asked the student a few more questions while thinking out loud to engage the student in the process. By the end of the discussion, the student voiced her understanding of why she needed to evaluate how the physician's new orders impacted the patient. The educator participants in this study demonstrated the connections and steps needed to work through complex situations by role modeling their thinking and how to explore their assumptions. When educator thought out loud, it provided a critical learning opportunity by demonstrating the manner in which critical thinking can be applied and facilitated the development of each student's trust, readiness, and confidence.

The findings from my study revealed that nurse educators demonstrate their critical thinking through evaluation and awareness of students' cognitive processing. Educators in my study indicated that questioning was an important technique they could use to understand each student's level of understanding while also being able to role model their own critical thinking. Educators engaged students in purposeful questioning using astute assessment and analysis skills. When asked how they exhibited their critical thinking to students, participants voiced, "I think with my questioning, I do. Asking them why things are occurring and how that's related to their patient's conditions or their interventions that they're performing." Some participants used questioning to emphasize a specific focus with students. For example, one participant stated, "I think my focus is priorities, it's quite significantly about priorities. So you've given me this bunch of data but what's the most important pieces out of it? …I

really want them to focus on putting together the key pieces of data related to what they've come to me about."

Nurse educator participants formulated a variety of questions in order to guide student thinking in purposeful directions. A strong nursing knowledge base was an important precursor to asking skillful questions, as evident in the interviews. For example, one participant stated, "well, you have to have critical thinking, you have to have a strong understanding of what you're talking about in order to question." As well, educators were able to ask the questions and allow students to create their own responses. One participant shared, "it's more like a discovering process because I let them discover the answer rather than me asking the questions and serving them the answer."

Educators also asked questions to role model some of the critical thinking dispositions including inquisitiveness and approachability. For example, one educator asked multiple questions of students and staff throughout the shift and often said to students, "you know me, I like questions and I always want to know more about the situation!" Their display of key dispositions while questioning emphasized the interconnection between dispositions and critical thinking. Nurse educators fostered a culture of curiosity by demonstrating the acceptability of asking questions. The creation of this culture resulted in students feeling comfortable asking questions as well. According to one participant, "I question myself all the time…it's a huge, huge role." Participants identified that the manner in which they used during questioning was also important. One participant identified that to question students in a non-threatening manner is an

essential aspect. Questioning is regarded as a significant teaching method to foster students' critical thinking (Nickitas, 2012). According to Nickitas, "there is no better way to promote knowledge awareness and mastery of content than by asking a thought provoking question…" (2012, p. 106). Nickitas (2012) also believes that "nurse educators must ask questions in skillful and strategic ways" (p. 108). When asking questions, nurse educators need to understand the direction they would like to lead students. In this sense, educators often think in terms of answers not questions (Nicholl & Tracey, 2007, p. 291), therefore, formulating questions with a specific purpose in mind takes cognitive skills to direct student's thinking. Brookfield (1987) found that critical questioning takes skill and experience to apply as it can externalize one's assumptions. In my findings, questioning was more than a technique to foster students critical thinking, it also demonstrated educators' curiosity and their ability to help guide students' thinking toward a predetermined direction using strategic and incremental steps.

Previous studies have found that nurse educators tend to ask lower level questions more frequently than higher level questions (Profetto-McGrath, Bulmer Smith, Day & Yonge, 2004; Saeed, Khan, Ahmed, Gul, et al., 2012). Although it is believed that high level questions best develop students' critical thinking, in my study nurse educator participants' critical thinking has been demonstrated by their ability to use a variety of leveled questions depending on the students' level of understanding at a specific moment in time. During this study, I witnessed nurse educators ask a variety of high and low level questions, although lower level

questions were more prevalent. This could be due in part to the level of student, as second and third year student groups were involved in this study. For example, one educator participant approached each student in their assigned clinical group one-on-one prior to the start of shift. The educator started each encounter by inquiring how each student was feeling about their patient assignment. Then, based on the student's response she would continue to use questions targeted at increasing the student's level of thinking, moving from simple to complex to evaluate each student's knowledge level. The educators' purposeful variation in the levels of questions being posed to students has not been explored in the literature to date. As one participant identified, "I think I use a combination of both [high and low level questions] because for me to be able to lead them, guide them in the right way, I need to know certain questions like history or vital signs or assessment data, plus all the other pieces of information. So I think I use a combination of both."

McAllister, Tower and Walker (2007) believe that educators need to be patient and persistent when using questioning with students in order to foster an excitement as well as to role model how to critically question the clinical experiences around them. The clinical setting offered many opportunities for educators to use questioning while participating in this study. All educator participants posed questions to students about patient care planning, patient acuity changes, and health assessment data. Educators also applied their critical thinking skills and dispositions through the indiscernible methods to decide how best to use critical questioning and other teaching techniques.

The indiscernible aspects of role modeling appeared to originate more cognitively within each nurse educator participant. For example, during the interviews, educators talked about the constant assessment and evaluation of themselves, students, and the context around them. For example, one educator stated, "so you may put something together that the staff aren't aware of or that the students aren't aware of and I think it's a matter of engaging them and also showing them, without being blatant as well." Another participant expanded and pointed to a state of cognitive awareness about one's thinking when there are outlier situations, or those that depart from what educators are used to. She stated:

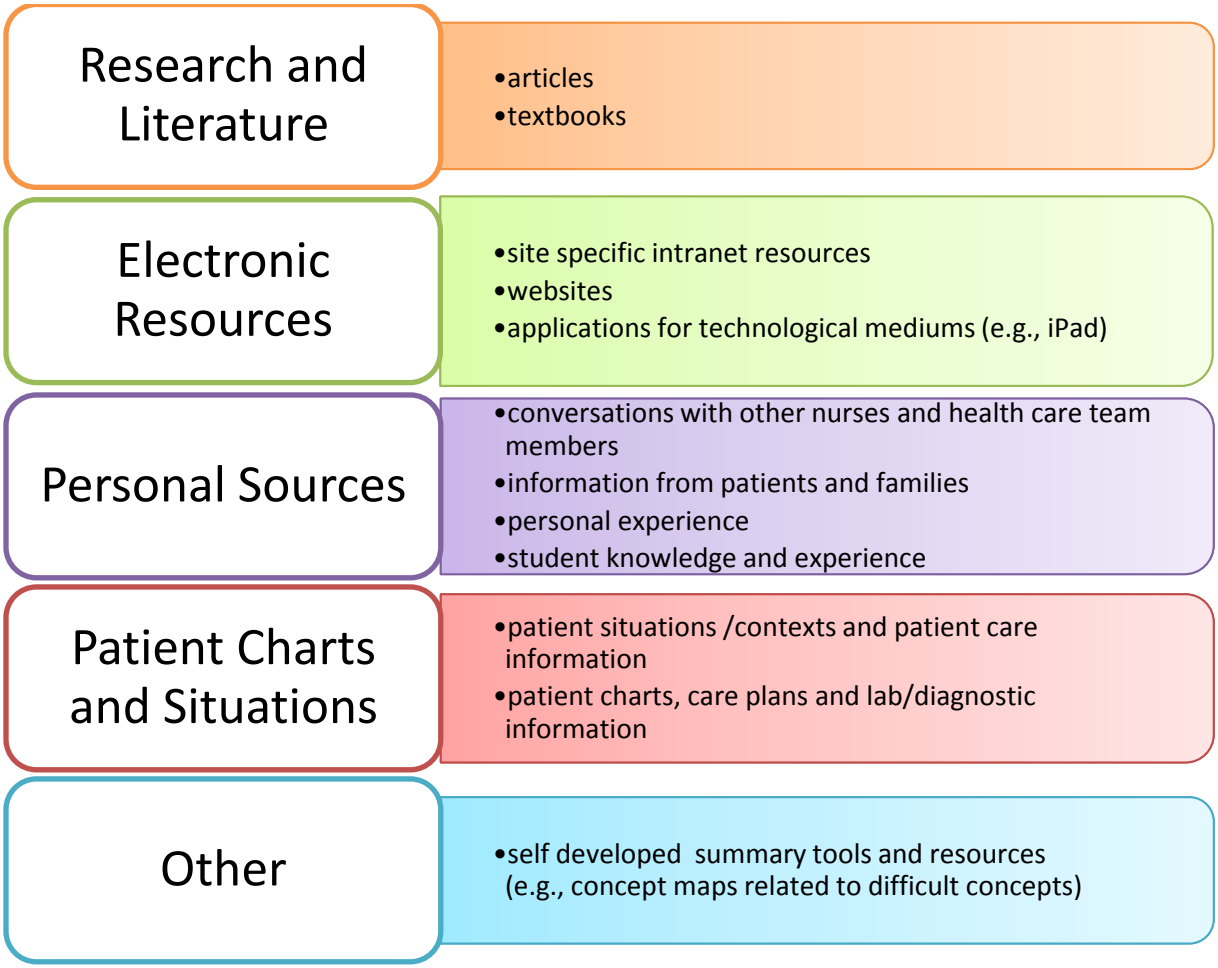
> I do think about my thinking….you know you do it purposely and if you're not, I think you're missing pieces right? But really with any interaction that I have, usually if it's kind of a mainstream one, I don't usually consciously reflect on it, but it's sort of those highs and lows. So if it's gone really well or if it's not gone really well, I really try to reflect on those and think. What were some of the highlights of that?

It is apparent from the findings that nurse educators' reflection on their thinking is an important yet less discernible aspect of their critical thinking. Nurse educators' thinking that goes on behind the scenes is as critical as the behaviours or actions that are visible to others. Brookfield (1995) emphasized the importance of reflecting on one's personality as the educator, as well as on one's experiences with learning. Examining the assumptions one holds about the world around them is also an important aspect of thinking critically (Brookfield, 1987,

1995). Educator participants demonstrated that reflecting on how one interacts with others is important, in tandem with understanding how one finds, gathers, summarizes, and implements resources to shape the assumptions and knowledge that underpin their thinking.

Explicit and Implicit Mobilizing and Operationalizing Resources. The explicit and implicit searching out and applying of selected resources and research findings to make decisions and plan care is another contributing factor in the way nurse educators revealed their critical thinking in the clinical setting. Explicit mobilization and operationalization of resources is defined in this study as seeking, finding, gathering, summarizing, and using valuable sources of information that are clearly identified and discussed within learning interactions. Educators demonstrated implicit mobilization and operationalization mainly by using resources during their pre-shift preparation and post-shift reflection. This included independently seeking resources available outside the clinical setting, as well as using information during learning interactions with students that did not have a clearly identifiable origin. Figure 6 displays the various types of resources nurse educator participants reported gathering and using to support their critical thinking.

Figure 6: Types of Sources Used by Nurse Educators While Mobilizing and Operationalizing Resources



The resources accessed by educators could have been either explicit or implicit depending on how individuals chose to use and discuss the various sources of information. Educators commented frequently about the importance of using resources in demonstrating their ability to think critically. Resources facilitated nurse educators' critical thinking by verifying or refuting their assumptions, as well as aiding in the synthesis of knowledge and information sources related to a given situation. One educator participant added that another commonly used source of information included "eavesdropping at the desk...not

eavesdropping but keeping your ear open at the desk, you learn so much." Educators used other resources such as "intuition, experience, knowledge base, …there's so many [resources] coming out that make it so much easier." An example of how resources were explicitly used within a learning interaction was when one educator engaged a student to discuss the student's plan of care. The student was asked questions about liver failure and possible patient symptoms. When the student verbalized uncertainty, the educator utilized a concept map she had created using research and literature related to liver failure. The concept map helped the student conceptualize important nursing related principles. The student expressed her understanding after reviewing the concept map. The self-developed tool allowed the educator to illustrate her ability to select and apply relevant resources in clinical practice.

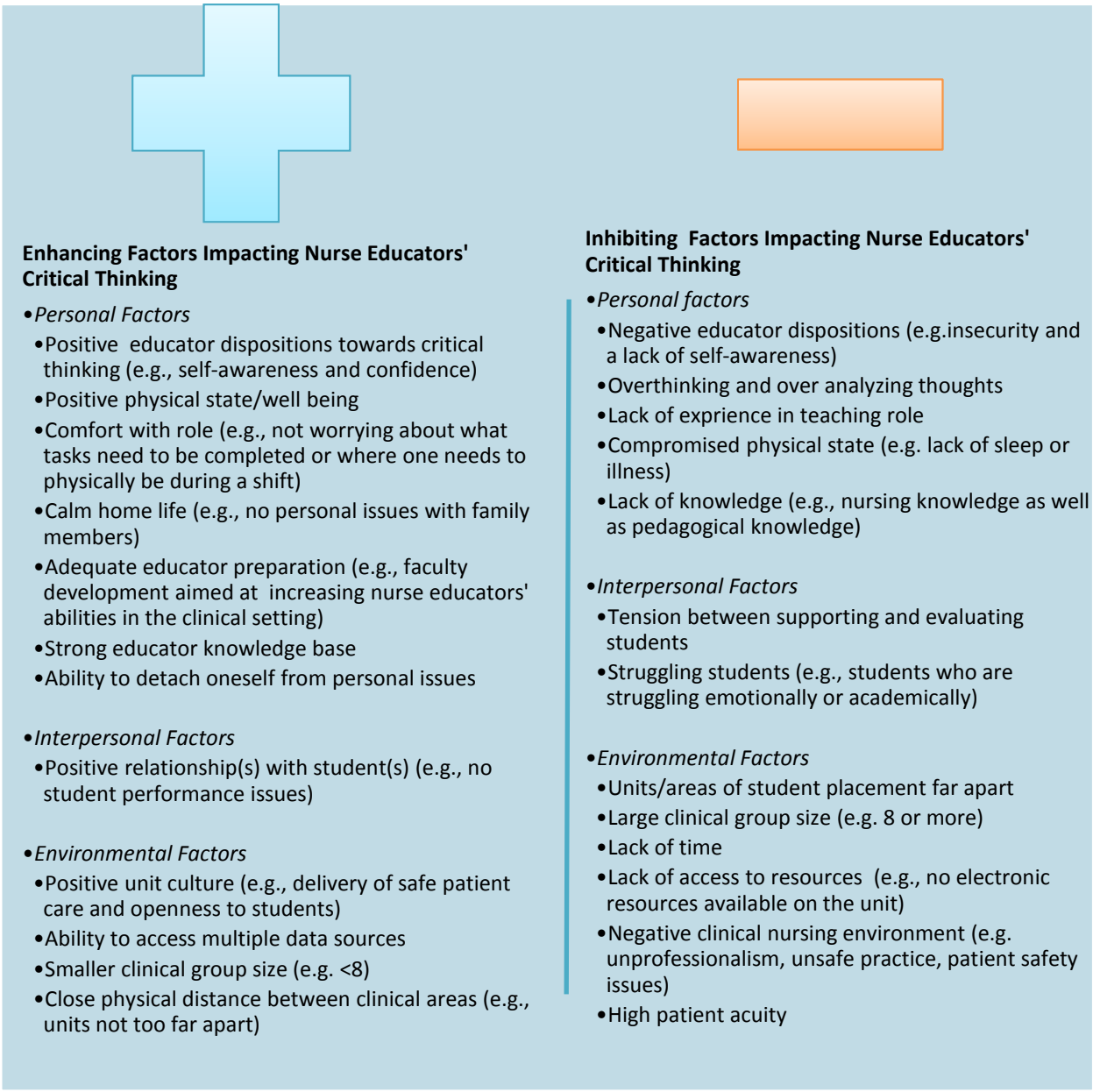
While there has been no published research that specifically examines nurse educators' use of research in clinical teaching practice, the general use of research evidence and sources of information to inform one's thinking in nursing and nursing education has been reported. First, nurses' use of research has been linked to quality patient care (Wangensteen, Johansson, Bjorkstrom, & Nordstrom, 2010). Yet, nurses' use of research in making care decisions has been typically low, despite nurses' valuing of research in practice (Profetto-McGrath, Bulmer Smith, Hugo, Patel, & Dussault, 2009). Second, nurse educators' use of research has also been linked to critical thinking dispositions. For example, Wangensteen, Johansson, Bjorkstrom, and Nordstrom reported that critical thinking was significant in predicting research use in a sample of newly graduated

nurses. Profetto-McGrath, Hesketh, Lang, and Estabrooks (2003) also established a correlation between research use and critical thinking in practicing nurses. More specifically, nurses' total critical thinking disposition scores were correlated with overall research use. It is unclear from previous research whether critical thinking informs research use and/or whether research informs critical thinking. Quite possibly nurse educators' critical thinking and research use reciprocally influenced each other; the complex relationship between the two requires more investigation. Based on my findings, it is evident that nurse educators used resources in a variety of ways to reflect their critical thinking. They used a variety of sources to increase their own knowledge; show students how to gather and evaluate credible resources; and apply quality information in order to reveal how they thought critically in their nursing practice. Nurse educators play a significant role in nursing education therefore their use of research and choices of information to support their thinking has the potential to impact students' learning. Furthermore, nurse educators' use and application of research related to both nursing education and clinical practice are integral to evidence based nursing and nursing education. In addition to the selection and use of resources, nurse educators in my study engaged in a process to balance the many factors that impacted their critical thinking.

Balancing Factors Impacting Nurse Educators' Critical Thinking. Findings from my study revealed factors that enhanced or interfered with nurse educator participants' critical thinking, which in turn influenced nurse educators' ability to share their critical thinking with students. Nurse educators need to have

an awareness of potential factors that may influence their ability to think critically in the clinical setting. Educator participants identified personal, interpersonal, and broader environmental factors that enhanced or inhibited their critical thinking and their ability to share it with students. Among the personal factors were elements or conditions originating from the educator (e.g., characteristics or physical attributes). Interpersonal factors included influential elements originating from the student-educator relationship and environmental factors were those conditions evident in the larger physical setting or political milieu. See Figure 7 for a list of the factors that research participants voiced and/or were observed during data collection.

Figure 7: Enhancing and Inhibiting Factors Impacting Nurse Educators' Critical Thinking



Educators identified their knowledge level as the most common personal factor impacting their critical thinking. When asked what facilitated their critical thinking, one participant stated, "I think just my knowledge base, primarily helps me. I'm confident in the knowledge I have and I want to share that. So, I think

that [this] is probably one of the strongest things that influenced me." Another participant demonstrated how her knowledge base was positively connected with her use of critical thinking during a student interaction related to an unexpected event. In this example, the student appearing to be quite panicked had approached the educator. The student's buddy nurse was on a break from the nursing unit and the nurse covering was busy with another patient. The patient assigned to the student had returned unexpectedly from surgery having had a different surgery than planned. The student was unaware how to properly care for the patient given the unexpected events. Through questioning, the educator calmly sorted through the situation by exploring the student's current knowledge base and what additional information the student needed to properly care for the patient. Given the educators' previous experience and knowledge of the type of patient care needed on the clinical unit, she was able to quickly identify and sort through the student's abilities, the nursing interventions required, any possible complications from the surgical procedure, applicable unit policies, important hospital procedures, and possible adaptations needed for the specific patient. This example demonstrated one educator's ability to integrate her knowledge regarding a variety of subjects and topics into a calm impromptu example of thinking out loud with the student while drawing on multiple sources such as online medication administration protocols, nursing care texts on the unit, and the patient chart.

One prominent inhibiting personal factor voiced by nurse educator participants was physical health. As one participant stated, "there's nothing worse

than when you have to go in there and you're not on the top of your game physically." Another personal factor that acted as a barrier to revealing their critical thinking was the potential role tension and role discomfort. One participant experienced both. She stated:

> My critical thinking is probably less on days when I'm processing more evaluation...it's not as smooth of a flow …definitely with my first clinical I don't think I was able to support or nurture [students] as well. I think just because a lot of my thoughts were, "Is this what I should be doing? Is this what's really expected of the course? Is this where I need to steer students?" So it was a lot more figuring out the process and the lay of the land for this role.

Another participant also made an association between critical thinking and the negative impact her stress has on the process by stating, "I don't think nearly as well under stress and I imagine that students wouldn't either." In addition to the numerous personal factors potentially impacting nurse educators' ability to share their critical thinking, this study, I also identified inhibiting and enhancing interpersonal factors.

Student-educator relationships that were positive appeared to increase the frequency with which educators had contact with the student, as well as lengthen the duration of those interactions. In more connected relationships between educators and students, there was an ease of communication and more varied examples of how nurse educators shared their critical thinking. In one situation, an educator did not have a positive connection with the students in the group

compared to other educator participants in the study. She stated, " this was an angry group and I just couldn't connect with more than two of them... I have had to question a few students' knowledge levels and I think that has scared some of the other students." In this instance, the educator claimed she had to spend most of her time addressing student performance issues which tended to focus primarily on that student's required tasks and specific behaviours. Another example of an interpersonal factor that inhibited nurse educator's ability to use their critical thinking was the student's capacity to receive it. There was an astute awareness by one participant who identified that students' stress levels impacted their ability to reveal how they thought critically in the clinical setting. She stated, "it's not just the time, because you can have a whole lot of time and there's a certain point where they [students] are full and can't learn anymore…you have to know when to stop."

Larger environmental factors also played a role in facilitating and impeding nurse educators' critical thinking in this study. More specifically, participants commented on the general nature of clinical settings, noting their unpredictability and the important role staff on the units played in the educators' ability to show their critical thinking. One participant emphasized the unpredictability of some nursing units where she is assigned to teach. She stated, "You don't know what you're going to get when you get there." Unit managers and staff who embraced new ideas and demonstrated excellent quality patient care were more facilitative of nurse educators' desires to openly explore assumptions, gather data, and evaluate sources of information with students. On the contrary,

there were a few environments where educators felt stifled and were not able to demonstrate their critical thinking as much as they would have liked. Educators who felt environmental factors inhibited their critical thinking identified that they had to spend too much time covering a large physical space, had too many students, and/or had issues with how patient care was being provided. As one participant identified:

> It's hard…like when patient safety is being compromised, I can't…step back and say "oh well I'm just here to observe", or whatever it might be. I have an ethical responsibility to say something about that, so that can cloud my critical thinking sometimes because the more you become immersed in things, the less objective you are.

Brookfield (1995) acknowledged the importance of context on the development of critical thinking. More specifically, environments where supervisors or leaders role model critical thinking and where reciprocal learning is supported, are more likely to breed deeper thought and reflective practice among educators. One could assume that educators would feel more inclined to critically think in environments where such thinking is openly valued. One participant highlighted the difference that exists between clinical settings. She added, "Some contexts are easier where staff is just so open with their information. Other staff sometimes don't let us in." Nurse educators also identified physical qualities of the environment that influenced their ability to reveal their critical thinking. Group size, physical setting, and unit milieu all contributed to how well educators were able to think critically and share it with

students. Smaller groups of students and units that were supportive of students were more fertile for critical thinking activities.

Critical thinking does not exist in a vacuum, therefore many factors affect how critical thinking is used and demonstrated. What and how various factors specifically influence nurse educators' critical thinking and their ability to reveal it in the clinical setting is not fully understood. Few research studies have explored specific factors linked to nurse educators' critical thinking. Of the four studies completed since 2000, Mangena and Chabeli (2005) found that a lack of knowledge, ineffective teaching strategies, negativity towards being challenged by students, and student selection processes, were barriers to facilitating critical thinking by nurse educators. It was apparent that the study by Mangena and Chabeli focused more on critical thinking barriers related to the education process as did Shell (2001) who identified student characteristics, time constraints, and a focus on content coverage to be the main inhibitors to teaching for critical thinking development in students. Other studies have confirmed these findings. Myrick and Yonge (2004) found that preceptor's strong opinions, unquestioning attitudes, and closed-mindedness negatively impacted the facilitation of graduate students' critical thinking in the clinical setting. Alternatively, safety, respect, flexibility, trust, and a healthy skepticism fostered student's critical thinking. Raymond and Profetto-McGrath's study (2005) reported similar factors (e.g., physical and emotional well-being, positive dispositions and a strong underlying knowledge base) that inhibited or facilitated nurse educators' critical thinking.

My current study was different from the four mentioned above as it focused specifically on the enhancers and inhibitors of nurse educators' abilities to reveal their critical thinking. Nevertheless, I maintain the process of facilitating students' critical thinking in nursing education is directly related to nurse educators' critical thinking and their ability to role model it in the clinical setting. Thus, I would argue that enhancers or inhibitors to any aspect of critical thinking would also impact the ability of nurse educators to engage and/or show their critical thinking.

Recommendations for Practice and Research

The experience of how nurse educators revealed their critical thinking in clinical learning interactions has been captured in a multifaceted model for further reflection. By applying the created model, which depicted how one group of nurse educators revealed their critical thinking in a clinical teaching environment, to other nursing education contexts, further explorations in this area can better inform the process and practice of critical thinking in nursing education. "True research does not end. Instead, it points the way for [or illuminates] yet another search" (Glesne, 2006, p. 220). Suggestions for future research based on findings from this study include:

- Further research using the model with various nurse educators to evaluate whether the model has legitimacy for clinical teaching.
- Further exploration of the linkages between nurse educators' critical thinking and resource/research use, role modeling, questioning abilities, and barriers/facilitators of nurse educators' critical thinking.

Implications for future practice based on the results of this study include:

- Implementation of workshops and learning activities to support faculty development focused on critical thinking, role modeling and questioning specific to working with students in the clinical setting.
- Continued emphasis on nurse educators' reflective practice and self-awareness associated with clinical teaching experiences.

Conclusion

Findings from this study offer insight into the role of nurse educators' critical thinking in the clinical setting. Hayajneh (2011) emphasized that clinical experiences are central to the application and socialization associated with nursing education. The interactive and social nature of thinking critically by nurse educators is multifaceted and plays an important role in developing future nursing graduates. Brookfield (2012) also highlighted the social nature of critical thinking development and the important role educators play in role modeling openness. Nursing education uses clinical experiences to facilitate the application of knowledge and development of nursing students' critical thinking. Furthermore, nurse educators are integral in facilitating students' critical thinking and the participants' experiences in this study demonstrated how their critical thinking can be mobilized through a variety of methods. The findings offer important evidence to further our understanding of how critical thinking is demonstrated by nurse educators amidst various factors and complexities. More specifically, the experience of how nurse educators revealed their critical thinking in clinical learning interactions has been captured in a model to prompt discussion,

reflection, and further understanding. The multifaceted nature of critical thinking in nursing education has been further emphasized and in the words of one participant "now I don't think of it [critical thinking] as only skills at all. It's a big picture."

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Chapter Six

Paper 4: Recruitment and Retention of Participants in Nursing Education Research- Lessons Learned

An important component of competent nursing care is the use of research findings in practice. A culture of evidenced based practice is evident in nursing along with calls for evidence-based teaching (Emerson & Records, 2008; Ferguson & Day, 2005). The provision of quality educational experiences requires that scholars and educators build a knowledge base from which pedagogical decisions can be made. In the past, the knowledge base underpinning nursing education was mostly experiential and tacit (Ferguson & Day). Currently, scholars have been actively building a theoretical, philosophical, and evidential foundation for the practice of nursing education. Despite valuable progress, continued research is needed to support the education of current students and future nurses.

In order to engage in evidence based teaching, educators need to seek and use research findings in their practice. Before findings can be used in practice, educators need to evaluate and deem them credible, as well as applicable. Quality research necessitates many standards including an adequate and representative sample. Furthermore, the validity and utility of research findings relies on researchers' efforts to adequately recruit and retain research participants to establish a representative sample from which data are collected (Broyles, Rodriguez, Prince, Bayliss, & Sevick, 2011). Although researchers need to

continue creating quality evidence to support nursing education, obtaining data from nurse educators as research participants is a challenge.

Issues with recruiting and retaining participants in nursing studies are evident despite many calls by researchers and educators to develop and refine a science of nursing education (Broome, Ironside, & McNelis, 2012). Few researchers have reported the struggles and issues experienced while recruiting and retaining research participants (White, 2012). Although some authors address recruitment and retention strategies related to longitudinal and clinical trial research involving patients, few articles exist that focus on obtaining participants for nursing education research. Broyles et al. (2011) stated, "recruitment can be particularly challenging when the intended study participants are health care providers…" (p. 1705). The time constraints and a potential disinterest expressed by health care providers were cited as some of these challenges (Broyles et. al). These same challenges may be seen when researchers engage in the relatively unknown task of recruiting nurse educators. Although Profetto-McGrath and her colleagues (2009) found that some nurse educators value research and its use within practice, it is not known what impacts nurse educators' decisions to participate in research studies as participants. More specifically, nurse educators in the study completed by Profetto-McGrath et al. (2009) reported moderately high research use from sources including personal experience, in-services, and journal articles. There are no published studies illuminating the factors that impact nurse educators' decisions to participate in research studies. Therefore, it

is important for researchers to report and discuss the challenges and successes they experience when recruiting and retaining nurse educator samples.

Researchers often plan recruitment efforts months in advance of carrying out a research study. These plans usually require careful forethought to determine the best strategies for the study and population of interest. Costs, logistics, contextual and pragmatic factors, all need careful consideration in order to achieve the study's aims. Study delays and cost escalations can occur when a researcher experiences difficulties trying to recruit enough participants (Broyles et al., 2011). Researchers would benefit from further understanding of the nurse educator population and how best to sample from it, so that recruitment efforts may be more efficient and effective.

The purpose of this paper is to discuss recruitment and retention issues related to nurse educator participants. First, I present a review of pertinent literature. Second, I share the challenges experienced while undertaking our research study and possible reasons for these challenges. Third, based on our experiences, I offer potential recommendations, solutions, and suggestions to guide further research.

Factors Impacting Recruitment and Retention

Calls continue from many researchers, educators, and scholars to increase nursing education research (Broome, Ironside, & McNelis, 2012). Although the literature reflects the importance of evidence based teaching, the state of nursing education knowledge based on research findings from which to draw on remains in its infancy (Patterson, 2009). The field of nursing education requires the

creation of robust knowledge to support educators' thoughtful utilization and dissemination of current knowledge to demonstrate best teaching practices, particularly related to clinical practice given its complexity and evolving nature. An important aspect of completing nursing education research is effective recruitment and retention of participants.

Recruitment and Sampling. Bonk (2010) described recruitment as an art and a science. "Recruiting subjects to participate in a study involves two major tasks: identifying eligible candidates and persuading them to participate" (Polit & Tatano Beck, 2008, p. 352). For the purpose of this article, recruitment refers to the interactional and multifaceted process of inviting and obtaining appropriate research participants who comprise a sample that is studied to advance knowledge. There is limited information provided in research textbooks explaining all of the nuances associated with recruitment of specific populations. Badger and Werrett (2005) identified that there is "little to assist researchers in daily challenges of actually implementing the recruitment plan" (p. 508). For example, there is little in the form of published guidance to inform how a researcher can manage low response rates, the pragmatics of gaining access into clinical settings, and unexpected reactions to recruitment materials. Textbooks describe basic approaches to recruiting and sampling however, the complex discussions of barriers and facilitators to research and contextual factors, such as work characteristics of identified populations or child care issues and timing constraints, are only found in published articles. Researchers' underreporting of research process details in the literature is one barrier to understanding

recruitment. Response rates are one of the underreported details in published research. Badger and Werrett (2005) found that half of the 270 nursing research papers they reviewed in 2002, originating from prominent peer-reviewed journals, did not report a response rate. It is understandable that some authors choose to omit these figures, given that the omission of response rates does not appear to interfere with publication of articles. Researchers' under-reporting of recruitment details is also prevalent in qualitative research literature. Although some authors have suggested effective recruitment methods about specific populations, such as palliative care patient families (Chaiviboontham, 2011) and vulnerable or difficult to access populations (Gemmill, Williams, Cooke, & Grant, 2012), limited information is available regarding recruitment of academics and/or educators as research participants. Broyles et al. (2011) emphasized that published information about recruitment of nurses as research participants is rare.

There have been reports in the literature that some methods such as using multiple sites and involving face-to-face strategies have been known to increase sample sizes (Badger & Werrett, 2005). Research ethics review boards may not sanction the use of face-to-face methods, nor may these methods be feasible for the researcher. Involving individuals embedded in the setting as recruitment champions may be another approach that researchers can use to yield more research participation. Some authors involving community members in the recruitment process to foster participant trust in the research and researcher (Pribulick, Canty Williams, & Stewart Fahs, 2010). Technological applications such as Facebook are also considered an effective way to invite large numbers of

individuals with limited effort on the part of the researcher (Amerson, 2011). Mychasik and Benzies (2011) reported that the use of Facebook facilitated retention in their longitudinal study. More specifically, attrition was decreased by 16% when 19 participants who were considered lost, were located using Facebook and rejoined the study. Despite the positive effect Facebook may produce on recruitment success, there are some potential challenges in using this social media tool. For example, some members of identified populations may not be connected via Facebook and would not have access to research requests. Kapp, Peters, and Oliver (2013) found that there has been limited examination of employing the use of Facebook in health related research. Despite its potential to revolutionize and globalize research recruitment, researchers' use of Facebook and other social media sites has not been extensively researched, leaving many specifics unknown. Researchers' knowledge of their target population and the tailoring of recruitment strategies accordingly are critical to the likelihood of an adequate and representative sample that is congruent with the nature of the study and the specific design. To facilitate an adequate sample, researchers may want to use effective strategies that have been proven to recruit specific populations.

Since differences in response rates are reported based on the location of the recruitment, another factor that impacts research recruitment is the setting from which participants are sought. Badger and Werrett (2005) reported that response rates in hospital and educational settings for qualitative research are higher when compared to community-based research. In comparison, the quantitative research they examined revealed no difference in response rates

across settings (Badger & Werrett). Therefore, the type of research appears to influence response rates.

The personal qualities of researchers and research specifics can also affect the recruitment process. Researcher qualities such as previous experience and interpersonal attributes are important considerations when selecting a recruitment plan. For example, researchers with experience in certain recruitment methods may have more experiential knowledge from which to draw or researchers who are comfortable and enthusiastic about recruiting face-to-face may have more success with that recruitment method. Researchers need to display positive qualities such as enthusiasm and engagement with prospective participants to increase the likelihood of participating (Kossman et al., 2011) however, this may be difficult depending on the method of recruitment being used. For example, online or email invitations to participate many not reflect the researcher's enthusiasm for their study. In this circumstance, the researcher may wish to pay more attention to how materials are visually represented.

A participant's decision to participate in a research study is affected by many factors, including the specific details of the research study. These specifics may include the amount of available funding to use for recruitment methods, as well as the match of sampling method to population. More specifically, populations who are technologically savvy may prefer electronic recruitment invitations via Twitter, Facebook, or email. The desirability of research outcomes may also persuade participants to volunteer depending on whether or not they can relate to or have an affiliation with the potential results. Additional factors that

may impact whether or not individuals participate in research include the complexity of participation requirements and the associated time commitment for each participant (White, 2012). If the commitment required is extensive then participant burden may preclude some from agreeing to participate.

Personal and Environmental Factors Impacting Recruitment and Retention.

Various personal and environmental factors are believed to affect recruitment and retention of research participants. Personal factors that impact whether an individual agrees to participate in research include fear of emotional distress caused by data gathering requirements or a sensitive research topic. As well, a participant's time constraints may conflict with the research participation requirements, thus causing some to decline their participation. Potential participants' negative personal attributes such as low morale, lack of motivation, or disinterest can negatively influence individuals when they are deciding whether to not to participate in research (White, 2012). Questionnaire fatigue, in which multiple research requests are made, may also overwhelm potential participants and thus result in decreased participation (White). Positively perceived participation-related benefits arising from the research findings may influence an individual's willingness to participate in research (Gul & Ali, 2010; Jacobson, Warner, Fleming, & Schmidt, 2008). More specifically, a research topic that directly impacts potential participants may influence them to participate because of their desire to understand more about the results. Individuals may also have an altruistic motivation to assist in knowledge creation, thus positively impacting their decision to participate.

How potential participants perceive the researcher may also impact recruitment success. For example, Gul and Ali (2010) emphasized that the first contact with each potential research participants is critical to recruitment. How a researcher's personality or competence is perceived may influence the number of individuals who sign up for the study. Additional elements of the first contact that could impact an individual's willingness to participate in research may include the first impression of the recruitment materials or message, perception of the researcher's enthusiasm for the research, readability of the materials, and comprehensibility of the requirements to participate (Gul & Ali; White).

The likelihood of participants signing up to partake in research is impacted by a variety of environmental factors. Gul and Ali (2010) stated that it is important to consider optimal timing when initially presenting research opportunities to potential participants. Pressured work environments that place significant stress on individuals may deter their willingness to volunteer for a research study. Different contextual pressures or overlap of events may further preclude research involvement. Given that nurse educator shortages parallel that of nurses in clinical settings, nurse educators have increasingly busy work settings and are "trying to keep afloat with teaching" (Cash, Doyle, von Tettenborn, & Faria, 2011, p. 259). An individual's interest in volunteering as a research participant is likely to increase in contexts where research is valued by those in leadership positions (Broyles et al., 2011). Leaders can be essential role models for research participation and critical facilitators of recruitment efforts.

Furthermore, it is possible that in settings where many individuals support and partake in research activities that more participants may be willing to sign up.

Response and Retention Rates: Seeking to Uncover the Unknown. Polit and Beck (2012) defined response rates as "the rate of participation in a study, calculated by dividing the number of people participating by the number of people sampled" (p. 741). Response rates can be an indicator of successful recruitment efforts. Acceptable response rates appear to differ based on data collection methods and sources. Given that recruitment measures and response rates are infrequently reported by researchers in the literature, it is difficult to assess which strategies are more effective in specified settings. Badger and Werrett (2005) found that while nursing authors reported variable response rates, many authors fail to include lower response rates as a limitation of their studies. White (2012) has posed some important questions to generate discussion toward understanding how response rates should be better used and reported in published articles describing nursing research. These questions include:

- What is an acceptable response rate?
- Do we need standard response rates to verify both qualitative and quantitative research results?
- What recruitment differences affect response rates?

Discussions to explore these questions are needed in nursing education. Badger and Werrett added that nursing should be equally concerned with the lack of response rates reported, along with the reporting of low response rates.

Retention is defined as the continued participation of the original sample and the efforts that are needed to keep participants engaged throughout the entire research process. Retention begins with and is strongly linked to recruitment (McFarlane, 2007 in Pencoker, Byrn, Mumby, Estwing, & Ferrans, 2011). Although retention of participants is discussed in the literature, it is hard to differentiate from recruitment related information. Many authors discuss both recruitment and retention strategies as if they were one and the same. Even though there are similar strategies that can be used for both recruitment and retention, there are some important differences. Retention involves the ongoing efforts to make the research experience positive for the participants. It can be facilitated by creating positive interpersonal relationships with participants, treating participants with respect, using a project identity to make the research more easily identifiable, and reducing barriers for participants for the duration of the study (Pencoker et al.). Additional strategies reported to increase retention of research participants included developing trust between the participant and researcher, as well as offering monetary incentives or project-related token gifts such as t-shirts or coffee mugs (Roberts, 2008; Voyer, Lauzon, Collin, & O'Brien Cousins, 2008). Researchers reported some of the more common barriers to participating in research included childcare issues, family/personal routine disruption, and overlaps in work-research commitments. Similar to response rates, there is sparse reporting on attrition in published studies. As a result, little is known about why nurse educators choose to stop participating in nursing

education research and what retention strategies could be useful to address potential issues with attrition rates.

Recruitment and retention activities are often complex and influenced by contextual as well as individual factors. Compounding the complexity is the apparent decline of participation rates over time (Williams, Entwistle, Haddow, & Wells, 2008). Limited reporting of recruitment strategies, response rates, and attrition by experienced researchers in the literature has created a gap in resources for novice researchers. There is a need for researchers to report recruitment or retention successes and struggles so that others may learn from their experiences. The challenges and lessons learned from a mixed methods single phase triangulation study are reported below along with possible solutions and areas for further research.

Finding Participants for a Nursing Education Research Study: Lessons Learned

I completed a triangulated mixed methods research study with a final sample size of five nurse educators. The aim of my study was to explore nurse educators' critical thinking and how they revealed their critical thinking in the clinical setting while working with students. I used two online critical thinking assessment tools (California Critical Thinking Skills Test and Disposition Inventory), 24 to 32 hours of participant observation and two semi-structured interviews with each participant to collect data. The demographic details of the sample included a mean age of 36, an average of three years of teaching experience, and an average of almost 11 years of nursing experience. Most of the

educator participants in my study had a baccalaureate nursing degree as the highest degree obtained. I used a grounded theory approach based on the ideas of Charmaz (2006) for the qualitative portion of the study. The unanticipated small response rate resulted in changes being made to the sampling and data collection aspects of the study. Reasons and possible contributing factors for the low response rate are discussed below.

Recruitment Plan. The original plan for my study was to collect data in two distinct phases. In the first quantitative phase I sought to invite all faculty members from a large western Canadian baccalaureate nursing program to complete the two quantitative online critical thinking assessment tools. In the second phase I planned to randomly choose nurse educators from the first sample and invite them to complete the qualitative participant observation and interviews. The number of participants invited for the second qualitative phase was to be based on data saturation. The Health Research Ethics Board (HREB) and the chosen nursing program approved the initial sampling plan. I also obtained additional health authority approvals from the governing healthcare providers in the area. After obtaining ethical approval, I sent the initial general email invitation to potential participants through a program intermediary, as required. After only four individuals initially expressed interest in participating I sent out three subsequent general email invitations. The additional emails did not result in more nurse educators choosing to participate in the study.

With the initial low response, I altered our study sampling plan and obtained HREB approval for the revised plan. My new plan combined the two

separate quantitative and qualitative recruitment and data collection phases. My revised plan was also approved by the chosen nursing program from which participants were being sought. I sent individual emails over the course of two academic terms to each educator who met the revised inclusion criteria. New sampling yielded five nurse educators who comprised the final sample. Once an individual expressed interest, I applied for specific hospital site and unit approvals where he/she was to supervise students through an online request process. Four extra individuals expressed interest in participating in addition to the final five nurse educators. Of these four individuals, two did not return emails after initially expressing interest in participating, one experienced a workload alteration resulting in ineligibility and one was not able to participate because unit approval for completing the participant observation was not received in time to conduct the observational aspect of data collection.

Recruitment Discussion. Despite my best recruitment efforts for our study, the final number of participants was low. Five individuals agreed to participate out of the 35 who were first invited, for an overall response rate of 14.3%. This rate is low compared to published literature related to nurse educators and critical thinking. Based on an integrative review completed to examine studies published between 2000 and 2012, the response rates for six out of ten studies that reported these statistics ranged from 12% to 85% (Raymond-Seniuk, Profetto-McGrath, Myrick & Strean, 2014). Sample size recommendations are provided in the literature. Creswell (2007) stated that 20 to 30 individuals may be needed for a grounded theory study sample. Conversely,

Morse (2000) recommended that the number of participants is dependent on many factors, including the depth of data sought. Recruitment for our study was further complicated by the mixed methods approach. Comparison to previous published studies in terms of recruitment processes was not possible due to the limited number of mixed methods studies that have been completed using nurse educator populations.

Based on their integrative review examining research related to nurse educators' critical thinking since 2000, Raymond-Seniuk, Profetto-McGrath, Myrick, and Strean (2014) found that the reporting of response rates varied greatly between the published articles and dissertations. Four of the studies examined did not report any response rates. Overall, it is not clear what response rates are warranted for either a quantitative or grounded theory qualitative approach in nursing education related to the recruiting methods used in our study. This lack of clarity may be due in part to limited previous research examining nursing education and the sparse reporting of response rates in published literature and dissertations.

Other possible reasons for the low response rate in my study may point to issues in the sampling plan. My study may have had limited recruitment potential because I chose to include a single site versus collecting data from multiple sites. The use of one site was based on time constraints and the amount of funding I had available. Moreover, I may have underestimated the size of the population needed to retrieve an adequate sample, thus I did not invite enough individuals. Oversampling may have been warranted to ensure more participation

(Chaiviboontham, 2011; Gul & Ali, 2010). The sample for my study may have increased had I used snowball sampling in addition to convenience sampling. Robins Sadler, Lee, Lim, and Fullerton (2010) stated that snowball methods are useful for difficult to reach populations in which individuals can recommend the study to a colleague/peer. Broyles et al. (2011) suggested using a peer to peer recruitment strategy with nurse participants. This process can be achieved by identifying champions to act as key contacts and promoters of the research in selected settings (Broyles et al.). Although the invitations I sent were personally addressed to potential participants, only one out of the 30 non-participants acknowledged receipt of their personal invitation. This rate may indicate that the invitation might not have been valued, or was considered spam, or was ignored due to multiple requests and a lack of time to respond. It might be beneficial to use an expedient follow-up enquiry in future studies to verify reasons for non-participation (White, 2012).

I did not recruit for our study using a face to face method. Initially I sent out the email invitations to participate through an intermediary. Email remained the primary strategy I used to recruit participants, including the individually addressed emails that were sent to specific nurse educators. Face to face invitations or information sessions with potential participants might have been beneficial. Interestingly, Badger and Werrett (2005) suggested that similar response rates were obtained with either researcher or intermediary requests. The use of multiple invitation strategies such as email, Facebook and other social media may have resulted in higher numbers in our study (Amerson, 2011).

Additional approaches such as multiple and concurrent advertising approaches including posters, pamphlets and email invitations, might have also increased interest in my study.

Retention of Participants. The final five nurse educator participants completed all data collection components and remained in the study for its duration. Part of the success in retaining this small sample may have resulted from my concerted efforts to ensure participants felt respected and comfortable at all times. Over the duration of multiple interactions with each participant, I was able to create a connection with each nurse educator, which fostered a strong sense of trust (Pribulick, Canty Williams, & Stewart Fahs, 2010). As well, I was the primary researcher and completed all data collection at scheduled times convenient for each participant, eliminating the potential for variance from different data collectors (Gul & Ali, 2010). Care was taken to address the potentially intimidating nature of the participant observation data collection approach and to emphasize the non-threatening purpose of the study, which was to gather positive examples as to how nurse educators revealed their critical thinking. The participants were informed I was not monitoring them for purposes beyond those of the research study and I was not evaluating their teaching abilities (Broyles et al., 2011). I offered each participant a 15-dollar coffee card to thank them for participating. Although incentives or inducements can be helpful for researchers to recruit and/or retain participants, the value of each gift card offered to participants of this study was kept minimal to ensure it was not viewed as coercive (Gul & Ali). I remained in contact with each participant between the

data collection phases, which seemed to foster participants' association and commitment to the study. Knowledge and understanding of the population, environment/settings and contextual processes is a key element of successful recruitment and retention of research participants (Sydor, 2013). My knowledge of the nurse educator role was integral to being able to converse, relate, and build trust with the participants. Even though I did not create a project identity for this study, developing one for future larger studies will be an important consideration to foster participants' identification with any necessary correspondence.

Contextual Factors. There are many different variables that influence whether individuals choose to engage in research. Due to the limited reporting of research with nurse educators, it is difficult to understand what specifically influences this population. Personal and environmental reasons may have influenced nurse educators' decisions to participate in my study and are explored below.

In my study, I clearly communicated the study objectives in writing to the participants. It was possible that some nurse educators preferred verbal descriptions and/or did not understand what was being requested of them in the email invitations. It is also possible some educators were intimidated by or fearful of the data collection methods, which included participant observation and personal critical thinking assessment tools. Given that I was also a nurse educator at another nursing education institution during the time of the study, some potential participants might have been deterred from participating, fearing potential peer judgment. Some nurse educators may have been deterred from being involved due to their beliefs and thoughts about critical thinking. Critical

thinking may be construed as a deep and complex topic, possibly invoking feelings of uncertainty about one's own level of thinking. Gul and Ali (2010) found that research may have lower response rates when it has the potential to cause participants emotional distress. More specifically, research topics that are viewed as sensitive may recruit a lower number of participants because of potential fear or distress that participating might cause. Two nurse educators, who originally expressed interest in participating, expressed concerns that the researcher presence in the clinical setting might alter group dynamics and complicate the educators' work. Offering more information during the recruitment phase outlining the unobtrusive nature of the observations could have reassured potential participants. Participants who completed the study voiced that their experiences were positive and non-disruptive to their work with students in the clinical setting. One participant even asked if they could repeat the study to continue receiving the positive benefits they felt they received by participating.

A lack of participation in my study may have been related to nurse educators' personal characteristics and contexts. Although the final study participants expressed excitement to complete the research study, many others chose not to participate. Invited educators may not have had the individual resources (i.e., time, energy) to participate in the study given the multiple data collection methods used. This could have been due to stressors such as being physically and emotionally taxed by their teaching (White, 2012). It is also possible that invited nurse educators were experiencing stressful work conditions, low morale, and were unmotivated to complete additional non-work required

activities such as participating in research examining their critical thinking (Whalen, 2009). Potential participants may have been experiencing stressors related to family commitments that may have been prohibitory (Gething & Leelarthaepin, 2000). Broyles et al. (2011) also identified study burden and a lack of time on the part of healthcare providers as potential barriers to research participation.

Potentially, the link between personal empowerment and job satisfaction could offer an important clue to encouraging nurse educators to partake in research. Baker, Fitzpatrick, and Quinn Griffin (2011) discussed the presence of a link between empowerment and job satisfaction in a variety of environments. For example, workers who believe there is an opportunity to empower oneself through research may experience increased job satisfaction and therefore be more inclined to participate. Possibly those educators who participated in my study felt a sense of empowerment by examining their own critical thinking and learning more about it. Despite multiple studies finding an overall moderate [positive] level of job satisfaction among nurse educators (Baker, Fitzpatirck, & Quinn Griffin, 2011; Gui, While, Chen, Barriball & Gu, 2011; Whalen, 2009), the occurrence of combined personal and work stressors may have impacted whether some educators choose to participate in my study.

Nurse educators' work environments are an important factor that may have influenced their decision to decline or participate in research. Contextual factors may have resulted in a lower sample size in my study. White (2012) discussed questionnaire fatigue and an overall hesitation by nurses to participate

in research. White also stated that nursing seems to have a culture "cautious of inquiry" (p. 17) in which participation in research is perceived as less desirable and the provision of personal information is often withheld. Perhaps recurrent requests made by researchers, a reflection of an increased number of invitations to participate in research, make some individuals more skeptical about divulging personal information or sharing their perspectives. Baker, Fitzpatrick and Quinn Griffin (2011), as well as Whalen (2009) and White (2012), identified several work stressors faced by nurse educators that may have prevented them from participating in my study. In their study, participants identified factors such as heavy workloads, multiple competing responsibilities, less than expected compensation, and working outside regular hours as the main stressors in their roles as educators. An apparent lack of release time from participants' teaching workloads for research participation may prohibit nurse educators' participation in extracurricular activities. As well, promotion and performance evaluations are often not affected by one's participation in research therefore may not be viewed as valuable in advancing their position. Williams, Entwistle, Haddow, and Wells (2008) suggested emphasizing the altruistic benefits of research participation may increase recruitment success. Nurse educators may not have perceived there to be any personal, professional, or altruistic benefit in participating as research subjects in my study.

The difficulties I experienced with external approval processes played a large role in my research study. Although the chosen nursing program supported the research study by offering their faculty as potential participants, I needed

clinical site approvals that were complex and time consuming. The multiple and lengthy permission processes to gain access to clinical sites resulted in at least one participant who could not complete the study because necessary multiple site approvals were not received in time. White (2012) identified the logistical nature of difficulties associated with gaining access to health care settings. When nurse educators are being studied within the clinical setting, there are many approvals needed. In my study, I could not seek the hospital site and specific unit approvals until I knew who the participants were and the units to which they were assigned as part of their teaching responsibilities. Given the challenges with obtaining enough clinical sites and the delays nursing programs experience waiting for formal approvals, many of the units in my study were not identified until immediately after commencement of each educator's rotation. It was foreseeable that approvals could take longer than participants' availability to participate, given that clinical rotations were less than two months in length and approvals took a minimum of four weeks to obtain. I may have yielded more success in recruiting individuals within clinical settings if I had anticipated these delays, opted for a longer data collection time period, or worked with key individuals to explore how to decrease the length of time it takes to gain approvals.

Additional Factors. The occurrence of simultaneous events may have also decreased participation in my research study. More specifically, the physical space move of the faculty to another building, as well as unpredictable workload adjustments in clinical teaching assignments, could have impacted the response rates. Delays in sending invitations to new faculty to participate in research also

resulted from changes in workload assignments. For example, one potential participant had to withdraw due to a teaching reassignment. As well, many nurse educators taught consecutive courses, which limited the number of different educators who could be invited to participate over time. Researchers' sampling from this population was affected by many variables and required much thought and planning prior to completing research given the realities of the clinical nurse educator population.

My recruitment and retention efforts may have been impacted by the absence of a robust formal pilot test prior to the completion of our study. Pilot testing in nursing education is not widely reported (Morin, 2003) but can predict practical problems and promote sampling effectiveness associated with recruitment strategies (van Teijlingen & Hundley, 2001). Pilot testing can also identify whether intervention burden may impact response rates (Gul & Ali, 2010). Nevertheless, limited funding may prohibit the feasibility of completing this type of research prior to a larger study (Thabane et al., 2010). In my study, I tested the recruitment strategies and data collection methods with the initial participant. No issues were noted concerning data collection methods or retention of the initial participant, therefore data collection continued as planned with subsequent participants. I may have wanted to seek additional funding for the completion of a larger pilot test prior to the planned study, which may have uncovered possible issues with recruitment over time. Unfortunately there was limited time and funding available for a robust pilot as is commonly experienced across nursing education research (Broome, Ironside, & McNelis, 2012).

Pilot testing is difficult, as I experienced, when response rates are low and the potential for not having enough participants for the pilot and the planned study is evident. The study I completed did not have the feasibility aims, pilot related questions, or initial plans to be considered a pilot. It is difficult to foretell whether a pilot test would have uncovered recruitment issues and possible strategies that I needed to address before recruiting into our identified study. Pilot testing although effective in theory, may be difficult to complete in nursing education research and ultimately requires further exploration.

Conclusion and Recommendations

The literature examining recruitment of nurse educators or academics as research participant is sparse. Other researchers may benefit from the lessons learned from the exploration of the recruitment and retention of research participants for the critical thinking study I completed. My research exploring nurse educators' critical thinking has added to the growing nursing education knowledge base; however low response rates have triggered important questions about how best to recruit nurse educators for future nursing education research studies. A deeper understanding of recruiting from specific populations, such as nurse educators, will positively impact validity of research findings, costs, and the ability of researchers to adhere to established timelines (Williams et al., 2008).

Based on lessons learned, I offer the following recommendations for practice:

- Encouragement, facilitation, and role modeling of participation in nursing education research by nurse leaders will further support the exploration of sound research findings on which pedagogical decisions can be based.
- Implementation of multi-modal, multi-site, and participant focused recruitment and retention strategies by researchers to address the complexities of nurse educator's work lives may increase recruitment success.
- The discussion and dissemination of appropriate response rates for nursing education research by researchers will assist in the tracking and understanding of how best to implement future research practices.
- Documentation of details by researchers including the pragmatics, logistics, and nuances associated with studying nurse educator populations will better track what is known in this area. These details include how best to invite, study, and retain nurse educator participants in nursing education research.

In addition to practice recommendations, the following suggestions for further study are also offered. Research is needed to:

- Study the personal and environmental factors that impact nurse educators' decisions to participate or decline participation in nursing education research.
- Systematically review published nursing education research to synthesize effective methods of recruiting nurse educators if these are provided.

A more in-depth understanding is needed to effectively recruit participants due to varying response rates across different populations of people. (Williams et al., 2008). For example, little is known about how best to access, invite, and retain nurse educator participants in nursing education research studies. This paper was derived from my experience related to the completion of a small study involving nurse educators and will be useful for other researchers in the field. It is important that researchers discuss and disseminate how a study was completed in conjunction with the research results in order to understand how to effectively study the phenomena and populations we wish to learn more about.

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Chapter Seven

Summary, Limitations, Delimitations, and Recommendations

Summary

Critical thinking remains an important skill needed in nursing practice to navigate the complex patient care contexts in which nurses work. In my research I sought to explore nurse educators' critical thinking in the clinical setting using multiple data gathering methods. From this mixed methods exploration, I offer my interpretation of how nurse educator participants revealed and shared their critical thinking through their interactions with nursing students. My findings represent useful knowledge that will serve to enhance nurse educators' clinical teaching practice. In addition, the challenges I faced during recruitment of nurse educator participants also offer important considerations for future research which plans to recruit academic or nurse educator participants. These results also advance the science of nursing education by increasing what is known regarding the role nurse educators play in developing future nursing graduates and nurses. This study further supports the role of critical thinking in nursing education by emphasizing its presence and value in the clinical setting.

The measurements I obtained of nurse educators' critical thinking using the California Critical Thinking Skills Test (CCTST) and the California Critical Thinking Disposition Inventory (CCTDI) were comparable to the scores reported in previous studies with nurse educators as participants. Nurse educator participants in my study demonstrated moderate critical thinking skill and an overall positive inclination to think critically, which is encouraging and similar to

findings in other studies. Interestingly, the CCTST and CCTDI rank order of subscale scores from nurse educator participants in my study were similar to results in the other limited studies completed in this topic area. For example, I found inquisitiveness to be a strong disposition for most nurse educators studied, as was the analysis critical thinking subscale. The possible emergence of common skills and dispositions, which may define population based trends in nurse educators' critical thinking, requires further investigation.

Using the qualitative data, I created a conceptual representation of how nurse educator participants in this study revealed their critical thinking. My conceptualization emphasizes the discernible and indiscernible nature of how nurse educators' participants revealed their critical thinking when interacting with students. The resultant framework consists of four categories with the foundational process emphasizing the importance of "fostering the student-educator relationship." Other aspects of the framework include nurse educators' role modeling of critical thinking; mobilizing and operationalizing of resources; as well as balancing the personal, interpersonal, and environmental factors which impact nurse educators' critical thinking in the clinical setting. Interestingly participants were not initially conscious of the ways in which they shared their critical thinking with students. After completing multiple data collection approaches, participants voiced their growing reflection and understanding of how role modeling of their critical thinking was evident in their interactions with students.

When I compared the qualitative and quantitative findings for congruency, it was challenging to analyze them for similarities or differences. I first examined the scores from the CCTST and CCTDI and then compared them to the interview transcripts and observational field notes to determine if commonalities could be substantiated across contexts based on what each nurse educator said and did in both the clinical and interview settings. Given the small sample size, comparisons did not yield consistent results. I did note a couple of significant observations that emerged from the data and that may warrant further investigation. Specific, definition-based dispositions that I found to be the most obvious during my interactions with nurse educator participants included inquisitiveness, confidence, openness, and flexibility. I found that the actions and comments associated with these characteristics or dispositions were more evident in participants who scored in the strong positive range on each respective CCTDI subscale. Interestingly, previous studies have also reported these higher scoring disposition subscales. As well, I found that educator participants who repeatedly voiced a strong tendency to reflect on their practice and thinking appeared to have higher scores on the confidence in reasoning subscale of the CCTST. Those who scored the highest on the total and subscale measures of each critical thinking assessment tool were not necessarily those who most obviously demonstrated their critical thinking to students. These findings should be further investigated to explore whether the possible link between the quantitative assessment scores and the qualitative indicators are significant.

Limitations and Delimitations

Given the small sample size I obtained and the convenience method I used to recruit participants, the findings from my study may not be generalizable. As well, the use of three data collection methods (online critical thinking assessment tools, interviews and participant observation) may have limited the nature of the data I collected. More specifically, I collected data from each participant using three approaches. Possibly using only one method repeated times may have yielded more detailed information.

The delimitations of this study included single-sampling from one nursing program and institution. This was intention to ensure the study was manageable. The use of many data gathering methods may have contributed to some superficial data. Also, my data collection, which I completed over a relatively short period of time, may not have captured the potentially changing nature of critical thinking that could be better captured through longitudinal research.

Recommendations

I have many recommendations based on the findings from this study. Future research is needed to:

- examine how nurse educators score on the CCTST and CCTDI in comparison with how they role model their critical thinking in a variety of settings.
- replicate this study with larger and more diverse samples of nurse educators.

- examine in detail the possible trends identified in nurse educators' scores on the CCTDI.
- implement the model I have developed with various nurse educators to evaluate whether the model has legitimacy for clinical teaching.
- confirm or negate the linkages between nurse educators' critical thinking and their resource/research use, role modeling, questioning abilities, as well as explore the impact of factors that impede or enhance their ability to think critically.
- study the personal and environmental factors that impact nurse educators' decisions to participate or decline participation in nursing education research.
- systematically review published nursing education research to synthesize effective methods of recruiting nurse educators.

In addition to future research, I suggest the following recommendations for practice:

- Discuss and disseminate appropriate response rates for nursing education research by researchers to assist research consumers in the tracking and understanding of how best to implement future research practices.
- Document details of research including the pragmatics, logistics, and nuances associated with studying nurse educator populations to better track what is known in this area. These details include how best to invite, study, and retain participants in nursing education research.

- Encourage, facilitate, and role model participation in nursing education research by nurse leaders to further support the scholarship of discovery.
- Implement multi-modal, multi-site, and participant focused recruitment and retention strategies by researchers to address the complexities of nurse educators' work lives to increase recruitment success.
- Develop and implement workshops and learning activities to support faculty development focused on critical thinking, role modeling, and questioning specific for nurse educators who are working with students in clinical settings.
- Continue to emphasize the importance of nurse educators' reflective practice and self-awareness associated with clinical teaching experiences.
- Enhance nurse educators' practice through the use of reflection and engagement in ways that support their own critical thinking skills and dispositions and how these can be role modeled in the clinical setting.
- Offer self-evaluation opportunities such as the administration of the California critical thinking assessment tools by nursing programs to nurse educators' who wish to increase their self-awareness by measuring their critical thinking.
- Offer faculty development opportunities in support of nurse educators' ongoing development and role modeling of critical skills and dispositions.
- Engage in teaching and learning related research focused on critical thinking to support further understanding of this topic area.

Conclusion

The findings from my study add to the ongoing discourse of how nurse educators' critical thinking is mobilized in the clinical setting. Given the lack of a consensus on a critical thinking definition, the limited research related to nurse educators' critical thinking, and the few conceptual frameworks that address how critical thinking exists in nursing education, my conceptual model provides one interpretation of the important role nurse educators' critical thinking plays within the learning environment. These findings offer important opportunities to advance evidence based teaching as well as offer a starting point for educators to reflect on their own critical thinking. This study has also emphasized the challenges faced by nurse researchers when recruiting and retaining a nurse educator sample. The importance of understanding and mobilizing nurse educators' critical thinking in nursing education has been illuminated throughout my study and in the words of one participant, "I think you have to be a really good critical thinker to effectively educate."

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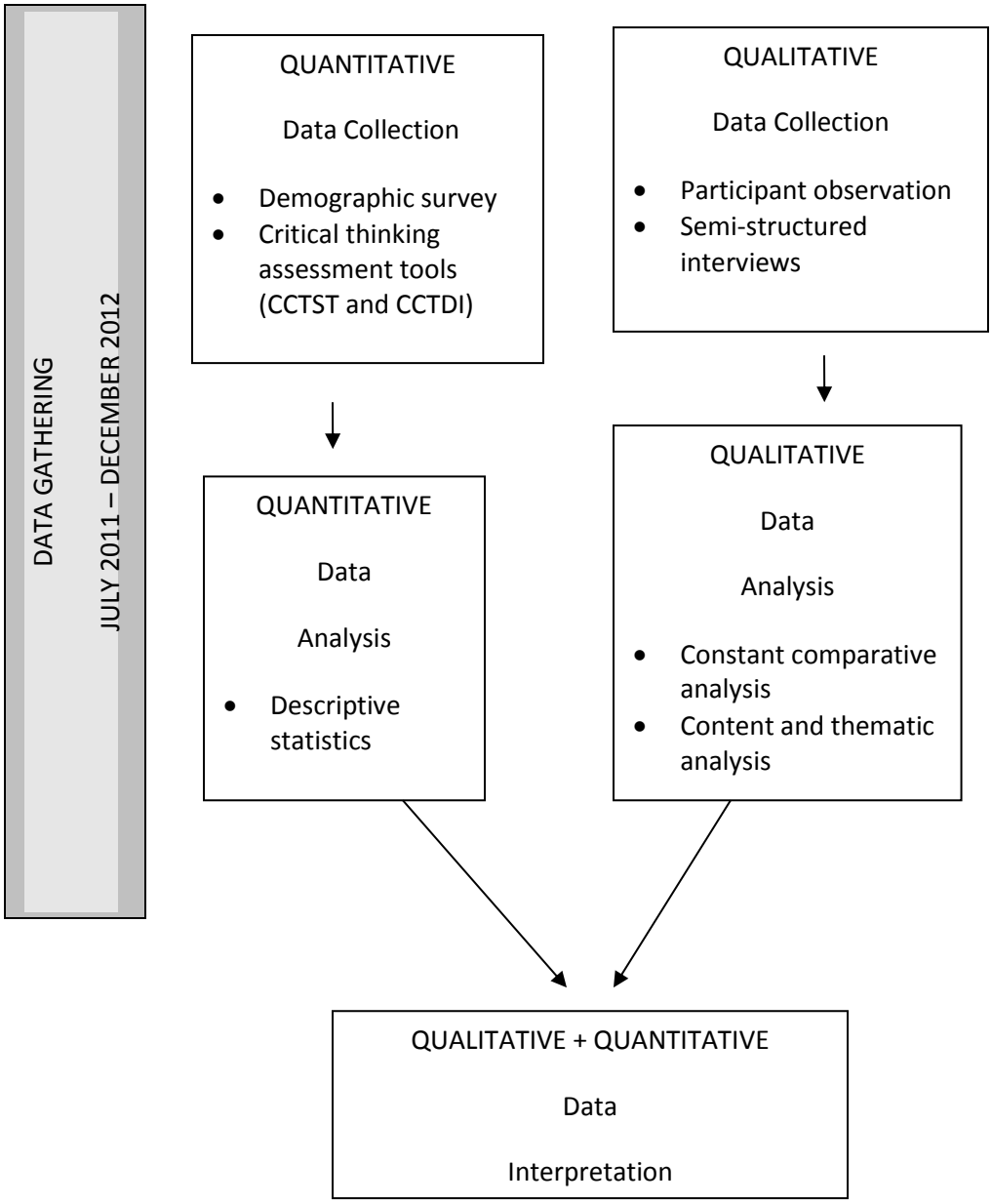
Appendix A: Triangulation Mixed Methods Design



Appendix B: Information Sheet and Consent for Nurse Educator Participants

Title of Research Study:
A Mixed Methods Exploration of Nurse Educators' Critical Thinking

Principal Investigator: Christy Raymond-Seniuk RN, BScN, MEd, PhD (doctoral candidate)
Doctoral Supervisor: Dr. Joanne Profetto-McGrath RN, PhD

Background: Critical thinking is a highly desirable and necessary skill in nursing. The process of developing students' critical thinking involves the ability of nurse educators to role model their critical thinking in practice. To date, limited information is known about nurse educators' critical thinking. This study will examine nurse educators' critical thinking in practice.

Purpose: You are being asked to participate in a research study to investigate nurse educators' critical thinking. The assessment tools, interview, and participant observation is expected to better inform how nurse educators' critical thinking is revealed in the clinical setting. The purpose of this research is to understand and effectively measure nurse educators' critical thinking.

Procedures: Participating in this study will involve:
a) completing two (2) critical thinking assessment tools (1.5 hours)
b) being observed for four (4) **days/shifts** of clinical teaching (28 hours).
c) completing one (1) semi-structured interview (1.0 hour)
d) potentially completing one additional interview or focus group as needed (1.0 hour)

Total time expected is 31.5 hours.

Possible Benefits: Your participation in this study should increase your awareness of your critical thinking and nurse educators' critical thinking in general.

Possible Risks: Participants may experience some psychological discomfort during the observation aspect of the study.

Confidentiality: Critical thinking measurements will be housed anonymously with Insight Assessments until the researcher has completed the participant observation and interview. Responses recorded on the demographic survey and interview transcripts will be anonymized using pseudonyms created by the researcher. Critical thinking scores, transcripts, and surveys will be securely stored for a period of 5 years, after which time they will be securely destroyed.

Consent: Please complete the attached consent form before participating in the project. You are not required to participate in this project and are free to withdraw from the research study at any time. Whether or not you choose to participate will have no impact on your ongoing role as a nurse educator.

Contact Names and Telephone Numbers:
Please contact any of the individuals identified below if you have any questions or concerns:

(780) 497-5714 Christy Raymond-Seniuk RN, BScN, MEd, PhD(candidate), doctoral student, craymond@ualberta.ca
(780) 492-1597 Dr. Joanne Profetto-McGrath RN, PhD, doctoral supervisor, joanne.profetto-mcgrath@ualberta.ca

Consent for Nurse Educator Participants

Part 1:
Title of Project: A Mixed Methods Exploration of Nurse Educators' Critical Thinking
Principal Investigator: Christy Raymond-Seniuk Phone #: 780-497-5714
Doctoral Supervisor: Dr. Joanne Profetto-McGrath Phone #: 780-492-1597

_____

Part 2 (to be completed by the research subject):	Yes	No
Do you understand that you have been asked to be in a research study?	☐	☐
Have you read and received a copy of the attached Information Sheet?	☐	☐
Do you understand the benefits/risks in taking part in this research study?	☐	☐
Have you had an opportunity to ask questions and discuss this study?	☐	☐
Do you understand that you are free to withdraw from the study at any time, without having to give a reason and without affecting your employment as a nurse educator?	☐	☐
Has the issue of confidentiality been explained to you?	☐	☐
Do you understand who will have access to your critical thinking measurements, interview transcript, and recorded observations, including your personally identifiable information?	☐	☐

Who explained this study to you?
_____

I agree to take part in this study: YES ☐ NO ☐

Signature of Research Subject _____

Printed Name_____ Date:_____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate:

Signature of Investigator or Designee _____ Date _____

THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM AND A COPY MAY BE GIVEN TO THE RESEARCH SUBJECT

Appendix C: Information Sheet and Consent for Nursing Student Participants

Title of Research Study:
A Mixed Methods Exploration of Nurse Educators' Critical Thinking

Principal Investigator: Christy Raymond-Seniuk RN, BScN, MEd, PhD (candidate)
Doctoral Supervisor: Dr. Joanne Profetto-McGrath RN, PhD

Background: Critical thinking is a highly desirable and necessary skill in nursing. The process of developing students' critical thinking involves the ability of nurse educators to role model their critical thinking in practice. To date, limited is known about nurse educators' critical thinking. This study will examine nurse educators' critical thinking in practice.

Purpose: You are being asked to participate in a research study to investigate nurse educators' critical thinking. The participant observation of nurse educators will better inform how nurse educators' critical thinking is revealed in the clinical setting. The purpose of this research is to understand and effectively measure nurse educators' critical thinking. Student critical thinking or clinical performance is **NOT** the focus of this study.

Procedures: Participating in this study will involve being observed interacting with your clinical instructor in the clinical setting during four (4) clinical shifts /days (approximately 28 hours).

Possible Benefits: Benefits of the research include an increased understanding of nurse educators' critical thinking.

Possible Risks: Participants may experience some anxiety associated with being observed interacting with their clinical instructor in the clinical setting.

Confidentiality: Field notes made from observations in the clinical setting will not include specific names. Any student interactions recorded will be anonymized. Field notes will be kept in a secure location for 5 years following the study and will be securely destroyed after that period of time.

Consent: Please complete the attached consent form before participating in the project. You are not required to participate in this project and are free to withdraw from the research study at any time. Whether or not you choose to participate will have no impact on your educational progress or student evaluation.

Contact Names and Telephone Numbers:
Please contact any of the individuals identified below if you have any questions or concerns:

(780) 497-5714	Christy Raymond-Seniuk RN, BScN, MEd, PhD(candidate), doctoral student, craymond@ualberta.ca
(780) 492-1597	Dr. Joanne Profetto-McGrath RN, PhD, doctoral supervisor, joanne.profetto-mcgrath@ualberta.ca

Consent Form for Student Participants

Part 1:
Title of Project: A Mixed Methods Exploration of Nurse Educators' Critical Thinking
Principal Investigator: Christy Raymond-Seniuk Phone #: 780-497-5714
Doctoral Supervisor: Dr. Joanne Profetto-McGrath Phone #: 780-492-1597

_____

Part 2 (to be completed by the research subject):

	Yes	No
Do you understand that you have been asked to be in a research study?	☐	☐
Have you read and received a copy of the attached Information Sheet?	☐	☐
Do you understand the benefits/risks in taking part in this research study?	☐	☐
Have you had an opportunity to ask questions and discuss this study?	☐	☐
Do you understand that you are free to withdraw from the study at any time, without having to give a reason and without affecting your progress as a student?	☐	☐
Has the issue of confidentiality been explained to you?	☐	☐
Do you understand who will have access to recorded observations, including any potentially personally identifiable information?	☐	☐

Who explained this study to you?
_____

I agree to take part in this study: YES ☐ NO ☐

Signature of Research Subject _____

Printed Name_____ Date: _____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate:

Signature of Investigator or Designee_____ Date: _____

THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM AND A COPY MAY BE GIVEN TO THE RESEARCH SUBJECT

Appendix D: Semi- Structured Interview Guidelines

A brief pre-constructed script about the purpose of the study will be read at the start of the first interview for each participant. The signed consent form would be reviewed prior to commencing the interview. The following questions will be used to guide each interview. The interview will also be used to clarify any observations from the participant observation phase in the clinical setting.

Questions:

1. How do you define critical thinking?

2. From your perspective, what does critical thinking look like in practice?

3. How do you think you revealed critical thinking in the practice setting (teaching practice)?

4. What factors do you believe positively influence how you demonstrate critical thinking in the practice setting?

5. What factors do you believe negatively influence how you demonstrate critical thinking in the practice setting?

At the conclusion of the interviews, participants will be thanked for their time and assured that all responses will be kept confidential.

Appendix E: Demographic Survey Participant ID Number _____

Please complete the following demographic survey **AFTER** the critical thinking assessment tools have been completed.

1. Participant's age in years: _____

2. Level of Educational Preparation – please check **ALL** levels of education completed.

   _____ Baccalaureate Degree (nursing and/or other)

   _____ Master's Degree in Nursing

   _____ Master's Degree in Other: _____ (please specify)

   _____ Doctoral Degree

   _____ Post-Doctoral Study in: _____(please specify area)

3. Number of years teaching nursing: _____

4. Number of years as a Registered Nurse (RN) _____

5. Please indicate how you believed you scored on the critical thinking assessment tools used in this study:

   a) California Critical Thinking Skills Test (CCTST)

   _____ above average _____ average _____ below average

   b) California Critical Thinking Disposition Inventory (CCTDI)

   _____ above average _____ average _____ below average

6. What previous education / learning have you completed relevant to critical thinking:

   _____ none

   _____ some content within course(s)

   _____ course(s) specific to critical thinking

   _____ one or two workshop(s)

   _____ conference(s) specific to critical thinking

   _____ readings (published articles, textbooks, et cetera