

Explanatory Sequential Examination of Senior Baccalaureate Nursing Students'
Critical Thinking after Participating in a Skills Fair

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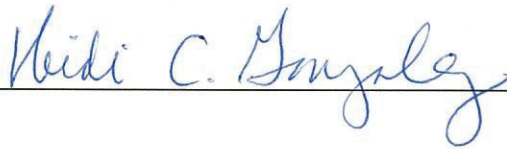
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ABSTRACT

Despite decades of research being conducted on the lack of critical thinking (CT) and the education-practice gap in new nursing graduates, the problem continues to exist. The lack of CT has been directly linked to medication errors, patient falls, and the failure to rescue which affect patient care and safety. A call to transform nursing education to promote CT and evidence-based practice is essential to bridging the gap between education and practice. Due to the rapidly changing and complex environment of health care today, the need for CT skills in the nursing graduate is more important than ever. Transitioning from passive teaching practices toward active learning strategies is recommended in nursing education to promote CT by engaging the learner and triggering cognitive development. An opportunity to create an active, innovative Skills Fair intervention grounded in Constructivist Learning Theory became available to a baccalaureate nursing program. The purpose of this mixed-methods case study was to investigate the effects of an innovative Skills Fair intervention on senior baccalaureate nursing students' achievement and their perceptions of CT skills development. The instrument utilized to measure CT was the Kaplan Critical Thinking Integrated Test. Eleven one-on-one student interviews were conducted to obtain the qualitative data. Although the results of the quantitative data showed no significant difference in achievement of CT between the participant and non-participant groups, during the interviews the participants did identify the Skills Fair intervention as a CT skills developmental strategy by helping them develop alternative thinking and thinking before doing. The interview data also revealed a combination of internal and external factors that influenced the development of CT skills during the Skills Fair. The main implication

of the study is participants perceived the Skills Fair intervention as a CT developmental strategy. This information is useful for nurse educators in planning their own active learning activities to promote evidence-based practice and CT to mitigate the education-practice gap and improve patient outcomes. Recommendations for future research include expanding the topic by including other regions, larger samples, other baccalaureate nursing programs, and other participants. An additional recommendation is to examine the effects of a more rigorous Skills Fair intervention in developing CT, studying the link between confidence and CT in nursing students, and defining the expectations of CT for the baccalaureate nurse.

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DEDICATION

I would like to dedicate this dissertation to my husband, Tom Gonzalez, for being my rock throughout this arduous journey. Thank you for the undying love and support you freely give me. To our boys, Tristan, Julian, and Lleyton - I thank you for sharing exuberant joy with us daily, and the pride and confidence you had in me to complete this dissertation. To my loving parents, Jim and Mary Netherton - I love you more than words can tell. I will be forever grateful that you fostered my curiosity as a child with those old encyclopedias and taught me the importance of perseverance, hard work, inquisitiveness, kindness, and truthfulness. To my other family members and friends: thank you for the prayers and encouragement given to achieve this goal. As always, thank you to God who continues to give me strength in all things.

Chapter I

INTRODUCTION

The lack of critical thinking (CT) in student nurses and new graduates in both nursing education and clinical nursing practice who directly influence patient care is of great concern to the nursing profession. Although CT is an essential competency of nursing education and practice, a gap between nursing theory and practice remains (Benner, Sutphen, Leonard, & Day, 2010). Chapter 1 begins with the problem statement and need for this research. The remaining components of this chapter include the purpose of the study, research questions, conceptual framework and methodology, limitations, assumptions, definitions, and summary to assist the reader in understanding the scope of this research. The significance of this research and the need for further research to develop CT in nursing students is addressed in this chapter.

Statement of the Problem

Many educators have asked the question, “Why don’t students know how to think critically?” Nursing researchers and educators have focused on this problem since the early 1980’s (Kaddoura, 2013). Many nursing programs strive to infuse CT into their curriculum because multiple ways of thinking are necessary for students to practice in ever-changing, complex clinical situations (Newton & Moore, 2013). However, the lack of CT is directly related to the high error rates in novice nurses that influence patient safety (Saintsing, Gibson, & Pennington, 2011). It has been reported as many as 88% of novice nurses commit medication errors with 30% of these errors due to a lack of CT

(Ebright, Urden, Patterson, & Chalko, 2004). Failure to rescue (FTR) is another type of error common for novice nurses, reported as high as 37% (Saintsing et al., 2011). The failure to recognize trends or complications promptly or take action to stabilize the patient occurs when health care providers do not recognize signs and symptoms of the early warnings of distress (Garvey, 2015). Internationally, this lack of preparedness and CT attributes to the reported 35-60% attrition rate of new graduate nurses in their first 2 years of practice (Goodare, 2015). The high attrition rate of new nurses has expensive professional and economic costs of \$82,000 or more per nurse and negatively affects patient care (Twibell et al., 2012).

Education-Practice Gap

Benner et al. (2010) reported a substantial gap exists between nursing education and practice. The education-practice gap is described as a distinct gap between the theory of nursing education and what is taught in textbooks with ideal patient situations versus nursing practice in clinical settings with the complex realities of patient care (Saifan, AbuRuz, & Masa'deh, 2015). Bridging the gap between education and practice in nursing will involve enhancing education to better prepare graduates for the realities of clinical practice (Nibert & Troseth, 2011).

Advancing CT to minimize the gap between nursing education and nursing practice is a serious concern to nurse educators, students, and hospital administrators (Mcnett, 2012). When an advisory board of deans and hospital nursing executives was questioned, the nursing deans stated they believed new graduates were ready to provide safe and efficient patient care 90% of the time (Nursing Executive Center, 2008). Conversely, the hospital nursing executives answering the same question believed that to

be true only 10% of the time. However, both groups agreed more should be done to close the gap between education and practice (Nursing Executive Center, 2008). Critical thinking was one of the areas where the two groups agreed new nurses have deficits (Nursing Executive Center, 2008). Despite educators' efforts to promote CT, there exists a shortfall in this skill for the novice nurse that contributes to the education-practice gap in nursing (Nursing Executive Center, 2008).

Need for Transformation in Nursing Education

It is imperative that nurse educators and health care partners improve the process of preparing students to think critically (Goodare, 2015) due to the complexities and rapidly changing environments of health care today (Benner et al., 2010). Nurses must be able to enter practice ready to apply scientific knowledge often in less than ideal circumstances. The call for significant change cannot be ignored in nursing education (Benner et al., 2010). Nurse educators must change the way they teach nursing.

Educators must prepare future nurses to be effective communicators, critical thinkers, and creative problem solvers (Rieger, Chernomas, McMillan, Morin, & Demczuk, 2015).

The movement for nursing to use CT as an outcome criterion began when the National League for Nursing placed this concept as a directive to ensure nursing program accreditation in the late 1980s (Fero, Witsberger, Wesmiller, Zullo, & Hoffman, 2009). The National League for Nursing Commission for Nursing Education Accreditation (CNEA) is an accrediting agency that ensures the quality, excellence, and integrity of baccalaureate nursing programs. The American Association of Colleges of Nursing (2008) published *The Essentials of Baccalaureate Education* that provides a framework

for nursing educators in planning and implementing baccalaureate nursing curricula relevant to changing health care systems.

Definition of Critical Thinking

Critical thinking is a required outcome measure in the evaluation and accreditation of baccalaureate nursing programs (McMullen & McMullen, 2009). Although nursing programs are required to adopt a definition of CT and indicate how students achieve this skill, efforts to understand how students achieve and define CT throughout nursing school have been substandard to date (McMullen & McMullen, 2009). Critical thinking has numerous definitions. The distinguished educational expert Dewey referred to CT as reflective thinking and recommended it as one of the primary aims of education (as cited in Zare & Mukundan, 2015, p. 258). Facione (1990) defined CT as the process of “purposeful, self-regulating judgment” (p. 2). Critical thinking includes a complicated process where decision making and problem solving are based on evidence, intuition, emotional intelligence, and reflection (American Society of Registered Nurses, 2007). Serving as patient advocates for high-quality care, nurses must be knowledgeable, compassionate, and active in educating patients and families to better health outcomes. Applying learned knowledge and creating individualized plans of care for patients and families requires CT skills of the nurse. Although the definitions and interpretations of critical thinking vary, a Delphi panel of experts identified, “interpretation, analysis, evaluation, inference, explanation, and self-regulation” as necessary components (Facione, 2011, p. 5).

The terms CT and clinical reasoning are often used interchangeably in the nursing literature (Fero et al., 2009). Critical thinking underlies independent and interdependent

decision making (AACN, 2008). Clinical reasoning in nursing is the process by which nurses collect cues, process information, come to an understanding of a patient problem, plan and implement appropriate interventions, evaluate outcomes, and reflect on and learn from their actions (Hunter & Arthur, 2016). The clinical reasoning process is reliant upon a CT mentality and is influenced by a person's attitude and perspectives (Scheffer & Rubenfeld, 2000). With the expanding complexities of nursing today, clinical reasoning is a core competency that needs to be vastly developed (Goudreau, Boyer, & Létourneau, 2014). Clinical decisions involve evidence, meaning, and results achieved (Pesut, 2001). Professional nursing requires strong CT, clinical reasoning, communication, and assessment skills (AACN, 2008).

Need for Critical Thinking in Nursing Education

Developing and promoting CT skills in nursing education helps nursing students quickly identify a problem, determine the best solution, and choose the most optimal and efficient method for reaching that solution in a training situation (Heaslip, 2008). Critical thinking skills allow students to confidently assess situations, eliminate irrelevant information, and make purposeful decisions in each unique patient scenario (Thayer-Bacon, 1993). Without the ability for the nursing student to make clear and rational decisions, patient safety is compromised (Saintsing et al., 2011). Facione and Facione (2013) reported the failure to use CT not only leads to the failure to learn, but to poor decision making and unclear communication which ultimately leads to patient deaths.

Active Learning Strategies

Active learning refers to a teaching and learning strategy based on experiential learning theory (Shin, Sok, Hyun, & Kim, 2015). Kolb's *Experiential Learning* (1984)

asserted, “learning is the process whereby knowledge is created through the transformation of experience” (p. 59). Characteristics of active learning include an emphasis on developing cognitive skills through student involvement through more than just listening (Russell, Comello, & Wright, 2007). Active learning strategies help students move away from passive learning toward developing concepts and understanding principles. This allows students to make connections with their knowledge and apply it to clinical practice. Active learning strategies are becoming the expectation in nursing education as these strategies make the classroom come alive and engage learners (Baker, 2011). Active learning helps promote CT as students are more responsible for their own learning and become more involved in the educational process (Russell et al., 2007).

Although active learning strategies are becoming more popular in nursing education, the body of evidence to support their use is limited (Waltz, Jenkins, & Han, 2014). Nursing educators need evidence to support pedagogical decision-making in nursing education. Nurse educators must promote and develop specific teaching strategies to promote CT among students (Newton & Moore, 2013). Therefore, more studies are necessary to build a solid rationale for the implementation of prescriptive active learning strategies in nursing education (Waltz et al., 2014). Further research is needed to evaluate how active learning strategies foster CT in nursing education (Waltz et al., 2014). A variety of active learning strategies and curricular approaches should be used to prepare nursing students with competencies to support evidence-based practice, CT, and enhance the science and practice of nursing (Winters & Echeverri, 2012).

Evidence-Based Practice

A paradigm shift in nursing education toward active learning that promotes CT and is grounded in evidence-based practice is crucial to solving the education-practice gap (Stanley & Dougherty, 2010). The nursing profession realizes using the best clinical evidence in making patient decisions results in positive outcomes for clients (Stevens, 2013). Nursing students who learn to incorporate evidence-based practice into their clinical decisions are professionally accountable to their patients (Polit & Beck, 2014). Evidence-based practice is needed to develop CT and salience in nursing students to meet the education-practice challenge in nursing (Benner et al., 2010).

Constructivist Learning Theory

A conceptual framework that accentuates the active development of CT is the Constructivist Learning Theory (Brandon & All, 2010). The major theme of this theory proposes learning should be an active process in which new ideas are formed from previously learned material. The Constructivist Learning Theory focuses on realistic approaches to solving real-world problems using the instructor as a coach to analyze the strategies students use to solve these problems (Murphy, 1997).

Skills Fair Intervention

McCausland and Meyers (2013) described an effective intervention in nursing education that promoted active learning and used various teaching strategies to prepare students for nursing practice. This intervention was an interactive Skills Fair. The researchers used active teaching strategies to engage students, promote learning, and develop CT. The active teaching strategies the researchers used for their study included role playing, evidence-based practices, return demonstration for skills acquisition,

gaming, coaching, and feedback. The Skills Fair utilized different teaching strategies to better prepare students for the clinical experience (McCausland & Meyers, 2013). The researchers had 17 displays and divided the 144 students into three groups of 48. Each group of 48 attended the fair for 2 hours and students were then divided into smaller groups according to their clinical groups and visited each display for 4.5 minutes. Examples of the interactive display stations to engage students included: drawing up and administering insulin based on blood glucose test results, role playing using a screening tool for addictions, and practicing chest percussions on fellow students. The student evaluations were overwhelmingly positive from the Skills Fair experience, and the pretest and post-test quiz indicated student improvement (McCausland & Meyers, 2013).

Another study regarding Skills Fairs for nursing students by Roberts, Vignato, Moore, and Madden (2009) described the necessity for this type of active learning strategy for students who have taken a break from nursing all summer. The goal for this Skills Fair intervention was to boost skills acquisition, confidence, and CT for nursing students. According to their research findings, psychomotor skills decline over time even among licensed experienced professionals within as little as 2 weeks and may need to be relearned within 2 months without performing a skill (Roberts et al., 2009). When applying this concept to student nurses for whom each skill is new, it is no wonder their competency result is diminished after having a summer break from nursing school. During the Skills Fair, the students were allowed to perform and practice skills after expert faculty demonstration (Roberts et al., 2009). The nursing students practiced with assisted guidance by expert faculty, and this ensured a non-threatening learning environment. The researchers concluded students learn most efficiently when educators

make the experience interactive and meaningful to the learner (Roberts et al., 2009). According to Knowles (1980), the adult learner prefers interaction, prefers to be in control of their learning experience, and needs learning experience to be meaningful (Wittmann-Price, 2013). Positive faculty-student interactions during the Skills Fair was essential to successful learning as students mature, advance, and develop CT at various rates (Roberts et al., 2009). The approach to facilitate the development of CT in this Skills Fair study was to present evidence-based practice to the students for each skill. This practice provided rationales in which students could understand not only the correct technique, but also the complex decision making needed in practice during different patient scenarios (Roberts et al., 2009). The praise and encouragement given from faculty during this study promoted student confidence and engagement (Roberts et al., 2009). The Skills Fair promoted a consistent teaching approach of the psychomotor skills to the novice nurse that decreased anxiety, gave clarity of expectations to the students in the clinical setting, and increased students CT skills (Roberts et al., 2009).

Further research is needed to understand the development of CT in the student nurse to ultimately promote patient safety and help close the education-practice gap (Saintsing et al., 2011). Despite the gap between theory and clinical practice being frequently cited in the nursing literature, there is a lack of nursing research in this area in finding solutions to the problem (Tadoura et al., 2014). A Skills Fair intervention is cited as a potential solution to the problem due to the various active learning strategies instrumental in developing CT, such as evidence-based practice, CT prompts, Socratic questioning, group work, guided discussions, return demonstrations, and blended learning (Hsu & Hsieh, 2013; Roberts et al., 2009).

To increase student success in the application of psychomotor skills, evidence-based practice, and CT, an innovation for the School of Nursing where I am employed was held at the beginning of Fall Semester 2015. The innovation included a non-threatening, fun, interactive learning Skills Fair for 104 junior and senior nursing students who had not enrolled in courses during the 2015 summer semester. The Skills Fair Team placed evidence-based practice rationale with CT prompts and evidence-based practice videos to the psychomotor skill rubrics (see Appendix A). Due to the positive verbal and written responses from students and faculty, the Skills Fair intervention was held again at the beginning of Fall Semester 2016 using the same delivery as the previous year. The 2016 Skills Fair included 184 junior and senior nursing students, including the senior December 2016 cohort who participated in both the 2015 and 2016 Skills Fair interventions.

Purpose of the Study

The case study method was used to investigate the effects of an innovative Skills Fair intervention on senior baccalaureate nursing students' achievement and their perceptions of CT skills development. The Skills Fair intervention in this research utilized the principles of active learning strategies and evidence-based practices to promote CT based on Constructivist Learning Theory. The explanatory sequential design was chosen for this case study to identify what effect a Skills Fair intervention had on senior baccalaureate nursing students' CT on the Kaplan Integrated Critical Thinking Test (see Appendix B) achievement, and then follow up with at least ten individuals to explore those results in more depth through individual interview sessions. Together, these two strategies of data collection and analysis were used to answer the following research questions.

Research Questions

1. What is the difference in achievement on the Kaplan Critical Thinking Integrated Test among senior baccalaureate nursing students who participated in the Skills Fair intervention and students who did not participate?
2. What are the senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of critical thinking skills during the Skills Fair intervention?
3. What are the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a critical thinking developmental strategy?

Significance of the Study

The Skills Fair intervention served as the focus of the study to determine the effectiveness of CT development of the students who participated. The significance of this study is the stated need for nursing education to improve CT and patient outcomes using active learning strategies to mitigate the education-practice gap. Critical thinking is crucial to solving the education-practice gap and will also advance the nursing profession through improved competence (Winters & Echeverri, 2012). The possible implications of this study include a change in teaching practices in nursing education that will promote CT and potentially impact professional practice (Saintsing et al., 2011).

The knowledge gained from this research may facilitate consideration by other nursing programs to implement a similar Skills Fair intervention that promotes evidence-based practice and CT as part of their curriculum. The possibility of making a recommendation to help mitigate the education-practice gap and promote CT in nursing students is the motivation behind this study.

Conceptual Framework and Methodology

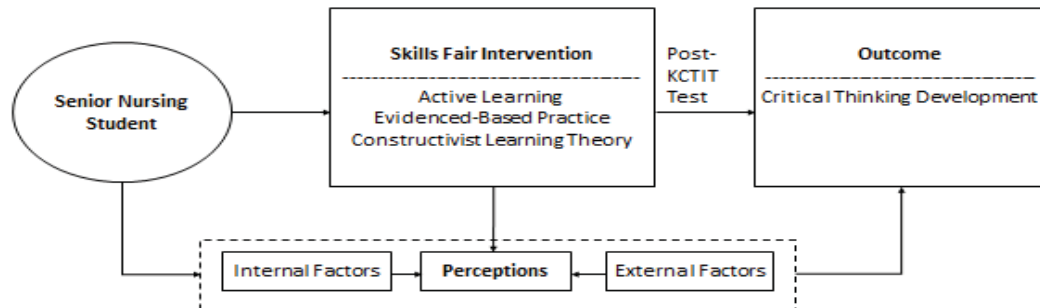


Figure 1. Skills Fair Intervention Concept Map. Note: This figure illustrates the conceptual framework of this study.

The explanatory sequential design chosen for this case study enabled a better understanding of senior baccalaureate nursing students' achievement and perceptions of CT after experiencing the Skills Fair intervention as depicted in the concept map in Figure 1. In seeking to improve understanding of the development of CT skills in nursing students, I used the Kaplan Critical Thinking Integrated Test (KCTIT) to obtain a quantitative measure for CT. This test is given during nursing students' first and last semesters of nursing school where the Skills Fair occurred to determine a measurement of CT throughout the program. The percentile rank of CT on the post-KCTIT was assessed to determine students' success on the CT test as it took into account the difficulty level of the test (Kaplan, 2012). The KCTIT post-test was administered to a cohort of senior baccalaureate nursing students within 3 months of attendance at the Fall 2016 Skills Fair intervention. This group of students also attended the Skills Fair in the Fall of 2015. In addition, I used one-on-one interviews to gather rich qualitative data.

Interviews and measurements of CT were used to highlight senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of CT skills during the Skills Fair intervention. I also sought to understand the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a CT developmental strategy.

The theoretical basis for this study utilized Constructivist Learning Theory, which is an active learning approach in which students construct knowledge by associating their experience with previous knowledge to create meaning (Wittmann-Price, 2013). This theory stems from Piaget's cognitive structure similar to Vygotsky's intellectual approach that results in deeper understanding (as cited in Chaipichit, Jantharajit, & Chookhampaeng, 2015, p. 2325). Constructivist Learning Theory was the ideal approach for the development of the active learning strategies incorporated for the Skills Fair intervention. The Skills Fair environment allowed the teachers to provide the setting, pose the challenges, and offer support that encouraged the cognitive construction of evidence-based practice and CT (Chaille, 2008). Since nursing students lack the experience of experts in the field, faculty bear the responsibility for guiding student activity, modeling behavior, and providing examples of evidence-based practice that will transform student group discussions into meaningful communication about important concepts (Flynn, 2005). The cooperative learning environment of the constructivist approach provided during the Skills Fair allowed students the opportunity to develop CT by reflecting on their experience as well as practicing evidence-based practice to guide their skills.

Limitations of the Study

There were several limitations for this study. One of the major limitations of the study was the limited exposure of students' time of access to the Skills Fair as it was a 1-day learning intervention. However, this was mitigated by the availability of the rubrics for the Skills Fair intervention to serve as references to guide practice and develop CT throughout the nursing program.

Another limitation was the sample selection and size. The Skills Fair intervention was limited to only one baccalaureate nursing program in one southeastern state. As such, the findings of the study cannot be generalized as it may not be representative of baccalaureate nursing programs in general.

Another potential limitation was the length of time between the Skills Fair intervention and the KCTIT post-test for Research Question 1. The test was taken by the participants within 3 months of the second Skills Fair intervention. The post-test was immediately scheduled once I gained approval to conduct this research from the dissertation committee and subsequent Institutional Review Board (IRB) approval (see Appendix C). In addition, this study did not consider students' CT achievement prior to the Skills Fair intervention. Therefore, no baseline measurement of CT was available for comparison. Other factors in the nursing program could have affected the students' CT scores on the KCTIT, such as anxiety or motivation that were not taken into account in this study. Also, student didactic and clinical learning may have attributed to the development of CT throughout the nursing program.

Gender may possibly be a threat in the qualitative portion of study as the majority of nursing students were female; however, I attempted to obtain a diverse pool of candidates who have similar demographics of the student population (Rappleye, 2015).

Reactivity was a potential threat. Reactivity occurs when people alter their behaviors when they are aware of being observed or recorded. I negated reactivity with neutral non-verbal language and avoided leading questions during the interviews.

Personal bias was another limitation. Open-ended questions were used to mitigate the possibility of personal bias. Through this approach, participants were able to expound and clarify information they shared with me. This also allowed me to probe for further clarification on any responses that were unclear. I utilized respondent validation once each interview was complete to improve accuracy. During each interview, I built relationships with the participants and tolerated silence to improve the validity of the study (Seidman, 2006). This practice decreased validity threats related to personal bias by creating long-term involvement while collecting rich data. I was open and nonjudgmental about my experiences as a nurse educator, in creating the Skills Fair, and working in the institution that held the Fair. I remained ethical by ensuring the interview participants anonymity by not placing their names on any of the information given and only utilizing information for research. I did not expect to rule out all validity issues during the study, but had a plausible strategy for potential threats and maintained integrity throughout the research study.

Assumptions

The assumptions were that the KCTIT would accurately measure and indicate significant changes in nursing students' CT by identifying lack of change or a significant increase in CT. The assumptions regarding the sample for Research Question 1 included senior baccalaureate nursing students from separate cohorts: one cohort who took part in the Skills Fair intervention and one cohort who did not. The assumptions for Research Questions 2 and 3 were senior baccalaureate nursing students who participated in the

Skills Fair intervention and gave consent to be interviewed would be an appropriate source for the qualitative data.

It is assumed that all respondents answered the interview questions honestly and to the best of their ability. An additional assumption regarding the sample included the purposeful selection of interview participants who best helped me understand the research problem and questions. I selected interview participants based on a range of high achievers and low achievers on the post-KCTIT to gather a broad collection of rich, qualitative data.

The theoretical assumption is the Constructivist Learning Theory, which has attributes of active learning that builds on previous knowledge, was the ideal theory for the Skills Fair Intervention to promote CT development (Lim, Honey, North, & Shaw, 2015). An additional benefit of the intervention was the feedback, including observed students' clinical skills and verbal reports of the impact of the Skills Fair. Another assumption is senior nursing students interviewed for the study participated in the Skills Fair intervention twice and were exposed to the concept of CT.

The interview protocol followed the nursing faculty's definition of CT as stated in the definition of key terms. Audio-taped interviews were transcribed, analyzed, and coded into response categories (Creswell, 2009). The ethical assumptions included giving thorough information to the participants of the study and answering questions appropriately. Additionally, participants were informed they were free to drop out of the study without penalty.

Definition of Key Terms

Defining the terms utilized in this study provides a greater understanding of the context in which the term is used. For the purpose of this study, these terms have the following definitions:

Active Learning Strategies

Active learning strategies are activities that make learning come alive and engage the learner (Wittmann-Price 2013). Examples of active learning strategies to promote CT used in the study for the Skills Fair intervention included evidence-based practice, CT prompts, Socratic questioning, group work, guided discussions, expert demonstration followed by guided practice, and blended learning (Hsu & Hsieh, 2013; Roberts et al., 2009).

Critical Thinking (CT)

The definition of critical thinking was formed from the following Delphi study consensus statement:

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).

Kaplan Integrated Critical Thinking Test (KCTIT)

The instrument utilized to measure CT in this study was the Kaplan Integrated Critical Thinking Test (KCTIT). The KCTIT is often given as a pre- and post-test to nursing students to determine any significant change in critical thinking after

implementing new learning strategies. The validity and reliability of the KCTIT is addressed in Chapter 3.

Evidence-Based Practice

Sackett, Rosenberg, Gray, Haynes, and Richardson (1996) defined evidence-based practice as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research” (as cited in Duke Libraries, 2016. para. 1). Evidence-based practice in this study meant using the best evidence from research findings for informing nurses’ decisions, actions, and interactions with clients (Polit & Beck, 2014).

Skills Fair Intervention

An active learning intervention focused on using CT and evidence-based practice to re-acquaint nursing students to previously learned skills after a period of absence from nursing.

Rubrics

Rubrics are used as tools for communicating major concepts and establishing standards learners use as a guide when practicing nursing skills in the Skills Fair intervention. The rubrics used in this study are examples of the rubrics nursing students used before the Skills Fair (see Appendix D) versus the example of the rubric previously mentioned in Appendix A used during and after the Skills Fair.

Summary

In nursing, CT for clinical decision-making is the ability to think in a systematic and logical manner with openness to question and reflect on the reasoning process used to

ensure safe nursing practice and quality care (Heaslip, 2008). Although CT has been discussed in nursing education for years, the ability for students and new graduates to demonstrate this skill continues to exist (Oermann, Poole-Dawkins, Alvarez, Foster, & O'Sullivan, 2010).

Active learning strategies and evidence-based practice are recommended to help students develop CT skills (Wittmann-Price, 2013). However, the research is limited in nursing education regarding which active learning strategies best promote CT and very few consider the perceptions of the nursing student (Waltz et al., 2014). By implementing the Skills Fair intervention using evidence-based practice and active learning strategies grounded in the Constructivist Learning Theory, students receive an in-depth understanding of issues related to nursing practice while critically monitoring their thinking. This critical, reflective appraisal of student performance during the active Skills Fair that incorporated evidence-based practice, CT prompts, Socratic questioning, group work, guided discussions, expert demonstration followed by guided practice, and blended learning ensured that student thinking met the standards for intellectual thought. Due to the many challenges in nursing and ever-changing complexities in the health care environment, CT skills are requisite for safe, effective patient care (Heaslip, 2008).

Chapter II

REVIEW OF LITERATURE

Introduction

This study was conducted in response to the need for nursing education to develop a deeper understanding of CT in relationship to constructivist-based teaching strategies. The continued lack of CT by new nursing graduates is directly related to cases of poor patient outcomes (Oermann et al., 2010). Although CT is a required outcome measure in the evaluation and accreditation of baccalaureate nursing programs, most efforts to evaluate CT are disappointing (McMullen & McMullen, 2009). In fact, the studies by McMullen and McMullen (2009) and Adams, Whitlow, Stover, and Johnson (1996), reported most studies found no change in CT skills during the length of a nursing program. Therefore, due to these studies recommendations, other teaching-learning strategies were recommended to increase the CT ability in nursing students (Chun-Chih, Chin-Yen, I-Ju, & Li-Chin, 2015). Despite educators' best efforts, nursing programs and hiring agencies are acutely aware of CT deficits and the education-practice gap (Benner et al., 2010). To address this gap, many nursing programs have implemented clinical experiences and innovative teaching strategies to develop CT and better prepare student nurses for practice (Ashley & Stamp, 2014). Active learning strategies that promote CT and evidence-based practice have been cited in the literature as solutions to addressing the education-practice gap (Kalb, O'Conner-Von, Brockway, Rierson, & Sendelbach, 2015). A Skills Fair intervention that implemented active learning strategies to promote CT and evidence-based practice was the focus of this research study.

The Skills Fair intervention was developed to increase student success using the foundational principles of Constructivist Learning Theory. The explanatory sequential design was chosen for this case study to understand baccalaureate nursing students' achievement and perceptions of developing CT after participating in the Skills Fair intervention. The significance of this study is the stated need for nursing education to improve CT and patient outcomes. The possible implications of this study include a change in teaching practices which will promote CT and evidence-based practice in nursing graduates, directly influencing patient outcomes (Saintsing et al., 2011). Critical thinking is vital to solving the education-practice gap and will also improve the nursing profession through improved competence (Winters & Echeverri, 2012). The knowledge gained from this research may facilitate other nursing programs to consider implementing a Skills Fair intervention that promotes evidence-based practice and CT into their curriculum.

The following literature review is based on a thorough search of health and professional databases with an emphasis on identifying issues related to the gap between theory and practice, CT, and how to develop CT in nursing education. Included is a concentrated literature review of the current available literature and research regarding CT in nursing.

Education-Practice Gap

The concern about the relationship between education and practice in nursing was first mentioned in the nursing literature in the 1960s (Falk, Falk, & Jakobsson Ung, 2016). The earliest form of the gap between theory and practice was related to medical lectures in the classroom versus acquired knowledge after caring for a patient. After

further investigation by Upton (1999), the dissonance between professional practice and ideals was found within the four cores of nursing: management, training, research, and education. The noted gap places novice nurses at a particular disadvantage entering the workplace as they are expected to be competent, autonomous registered nurses. The hierarchy and sequencing of learning in most nursing programs places a primary focus on theoretical knowledge before being able to apply the knowledge in practice (Falk et al., 2016). This hierarchy and historical preference for theoretical knowledge in the nursing curriculum may contribute to the education-practice gap.

The education-practice gap is viewed by many nursing researchers as a normal phenomenon because what educators teach in the classroom will never truly resemble a real life event experienced by a patient (Steele, 1991). It is impossible for faculty to plan completely or predict what students learn in the clinical setting as opportunities are random and based on patient availability (Ironsides, McNelis, & Ebright, 2014). Therefore, the education-practice gap cannot altogether be avoided. However, limitations should be considered.

A qualitative exploration of why the education-practice gap exists in nursing education was conducted by Saifan et al. (2015). The clinical environment is challenging and always changing, ensuring that theoretical learning will never adequately prepare students for complexities in practice (Saifan et al., 2015). The factors influencing student learning in the clinical environment were cited as unequal learning opportunities based on patient assignments, student assignments to a particular unit, and student assignments to a particular clinical instructor. Therefore, based on those assignments some students may be more equipped for practice than others. The authors conducted 30 interviews with

nursing students asking questions with the major theme of understanding the reasons for the education-practice gap. The findings of the study explained there is an apparent gap between the theory and practice in nursing education. One of the most important reasons in the study for the gap was the perceived lack of qualification of the clinical instructors and their absence from current nursing practice. Despite the clinical instructors having the appropriate credentials to teach, the absence from practical experience left the lectures with purely theoretical information with no real examples or case studies to share from real patient experiences. Poor communication, the sequencing of material in nursing education, the number of students, and time management were other reasons cited for the education-practice gap. Another finding was the challenge for students to transfer theory to practice as the students perceived the two being in different worlds. The students viewed theory as building a knowledge base and practice as learning nursing skills. Half of the students believed the clinical instructor played a vital role in decreasing the gap, and most of the students believed laboratory training was very beneficial to reducing the gap.

A study in Japan was conducted to understand better what connects nursing theory through education to nursing practice (Tadaura et al., 2014). The study investigated Orem's Self-Care Deficit Nursing Theory using the nursing process to interview nurses, who had worked at the hospital for over 20 years, about the gap between theory and practice. The researchers concluded student learning through the development of case reports that incorporated the nursing process helped bridge the gap between education and practice. The nursing process is a basic and central component of nursing care and involves five phases, including assessing, diagnosing, planning,

implanting, and evaluating (Lunney, 2008). Lunney (2008) reported applying the nursing process involves systematic and scientific solutions to patient problems based on CT. In addition, Tadaura et al. (2014) suggested clinical experiences following theory and the sharing of existing knowledge among nurses was critical in effectively bridging the gap between education and practice. Clinical experiences with seasoned nurses after student education in theory are recommended to bridge the gap between education and practice. In addition, Tadaura et al. (2014) recommended for students to develop CT, students should create their own case reports incorporating the nursing process after their experiences in the clinical setting.

Lewis, Stephens, and Ciak (2016) surveyed changes in attitudes toward patient safety after the implementation of a Quality and Safety Education for Nurses (QSEN) initiative based curriculum. The six QSEN competencies for nursing students included Patient-Centered Care, Safety, Teamwork and Collaboration, Evidence-Based Practice, Informatics, and Quality Improvement and were based on recommendations from the Institute of Medicine. The new curriculum in the study also focused on a conceptual approach using adult learning theory while teaching new approaches to clinical education with a focus on quality and safety. The study surveyed faculty, students, and preceptors about the six QSEN competencies to understand how students are performing in the clinical environment. The study was reassuring in that nursing students were given the highest and most positive results by nurse preceptors regarding patient-centered care and safety. However, the surveys reported both students and faculty members witnessed errors in the clinical setting. In fact, the study reported 90% of faculty surveyed witnessed errors in the clinical environment. The surveys revealed students were less

likely to report an error, particularly by the traditional method of using an incident report. Therefore, transparency of reporting errors may be a means to future improvement of patient safety. Implementing the practice of reporting errors by use of incident reports into the nursing curriculum may be one of the ways to bridge the gap between theory and practice. The researchers suggested the continued collaboration of clinical staff and nurse educators will be the answer to improving the culture of quality and safety in the professional practice of nursing and bridging the education-practice gap.

A study funded by the National Council of State Boards of Nursing (NCSBN) conducted by Ironside et al. (2014) challenged the current methods and thinking of clinical education in nursing. The study was conducted to investigate the education-practice gap and the many difficulties in preparing nurses for practice. The cited challenges for preparing students for practice in the study included: difficulty in predicting clinical experiences, limited availability of clinical sites and nursing instructors, lack of pedagogical evidence on teaching strategies, faculty struggles to spend quality clinical teaching time with each student causing a lack of appropriate guidance and feedback, and clinical education being a time- and resource-extensive form of education. The researchers reported, despite extensive changes in health care, clinical education has not evolved over time as faculty continue to teach as they were taught with a focus on timely task completion that consumes students' learning in practice settings. The researchers reported that rarely did they observe faculty guiding students to think through real or potential threats, situational factors, or patient preferences that would influence care given the resources available. Therefore, with the current task-oriented focused teaching methods in clinical nursing, it is no surprise students are not prepared

for the complex situations of the current health care system. The researchers reported faculty and students mutually worked very hard and took their job very seriously to provide safe quality patient care. The faculty participants shared intentions to help students critically think and make connections with educational information. However, the investigators observed instructors' methods consisted primarily of having students mark off tasks or quizzed students for memorized facts about certain medications or laboratory values. Therefore, the need for research that reflects how students can be best prepared for practice, to the full scope of practice, has never been greater. The recommendations in the study suggested nurse educators focus more energy on teaching delegation, quality improvement, and CT to prepare future nurses to provide the scope and quality care required. The researchers also suggested investigating new pedagogical strategies incorporating more complex aspects of nursing practice to improve patient safety.

Errors in Nursing Practice

In response to the concern for high error rates and patient safety, Fero et al. (2009) conducted a study to measure the CT ability of new and experienced nurses with varying levels of preparation using the Performance Based Development System (PBDS) as the assessment. The nurses assessed 10 common clinical problems encountered on a medical-surgical unit. The respondents were then asked to state the problem in writing, actions they would take, and their rationale. The study found 25% of the nurses were not able to recognize the clinical problem or safely prioritize care and intervene. The group also had difficulty anticipating medical orders, reporting relevant clinical data, and not being able to clearly articulate their rationale for decision making. As expected, new

graduates were less likely to meet assessment expectations. Therefore, the study suggested further research with innovative educational strategies to enhance CT abilities in nursing students be conducted.

Saintsing et al. (2011) wrote an integrative review to summarize recent findings related to the clinical decision making of nurses in the first year of their nursing career. The review examined types of errors, the cause of errors, and potential interventions in novice nurses. The results of the investigation substantiated previous research that identified medication errors, patient falls, and the delay of treatment as common errors for novice registered nurses (RNs). The most common error committed by novice nurses was medication errors estimated at 75% with a percentage of those errors due to a lack of CT. Saintsing et al. (2011) suggested nursing education include a more focused and specific CT curriculum where decision making is assessed and improved as students transition to practice.

Killam, Luhanga, and Bakker (2011) performed an integrative literature review about the characteristics of unsafe nursing students in clinical practice. They studied 11 relevant articles to understand better the attitudes, actions, and behaviors that influenced students' ability to provide safe nursing care. The students in the study reported educators are vital to shaping clinical learning experiences by being respectful, knowledgeable, and approachable (Hanson & Stenvig, 2008). However, despite teaching and learning strategies aimed at promoting student success, some students remain challenged at demonstrating safe care commensurate with their level of education. The researchers reported early identification of deficient clinical skills is essential to promoting competency. Killam et al. (2011) revealed unsafe students are characterized

by knowledge and skill incompetence, weak interpersonal interactions, and projecting an unprofessional image. The students who demonstrated the unbecoming behaviors were unable to provide safe, competent care because the continuum of care was disrupted. The care was interrupted and risked harm to the patient either physically or psychologically because important information was missed or misinterpreted causing clinical errors. The students who were unable to think critically and question their practice resulted in a wrong decision and increased the risk of patient harm. Additionally, Killam et al. (2011) reported the importance of professionalism as an essential component of nursing care, and any issues of extreme dishonesty or inappropriate attitudes can have devastating effects on safe patient care. Therefore, it is vital that educators are consistent in reporting and correcting any unsafe learning behaviors early in students' progression through the nursing program to promote safe patient care.

Despite the type of error or cause of the mistake, the issues of time management and lack of CT are the most likely causes of poor patient outcomes in regards to care given by novice nurses (Saintsing et al., 2011). However, it is difficult to discern between time management and CT issues in the novice nurse as the two issues can be reliant on each other. For example, the novice nurse may make judgment errors during a stressful situation regarding CT related to either real or perceived time constraints. Being aware of the types and causes of errors in nursing practice is the first measure to improved patient outcomes and improved retention of novice nurses.

Medication Errors. According to a study by Sitterding, Ebright, Broome, Patterson, and Wuchner (2014), medication use and process errors account for more than 7,000 deaths per year and more than 1.5 million preventable errors. Sitterding et al.

(2014) focused on understanding the cognitive work of nursing and factors related to situation awareness while handling interruptions during medication administration. Situated awareness in nursing means the nurse can manage competing sources of information and differentiate between pertinent information that is relevant to the task at hand. As expected, novice nurses were less adept at dealing with interruptions in comparison to expert nurses in the study. Sitterding et al. (2014) found both novice and expert nurses permitted interruptions to occur 81% of the time during medication administration. This important research by Sitterding et al. (2014) highlights the decision making of nurses during medication administration and why errors sometimes occur. Nursing educators can utilize this information to practice interruptions during the medication administration process throughout the program. Utilizing this practice may promote CT that will better prepare students for professional nursing and help mitigate medication errors.

Failure to Rescue. Another common type of error for novice nurses is the failure to administer needed care promptly (Saintsing et al., 2011). Misinterpreting time limitations resulting from the lack of experience by the novice nurse contributed to the delay. Garvey (2015) recognized failure to rescue (FTR) as a major cause of mortality in patients in acute care settings. The signs and symptoms of impending arrest can occur as early as 72 hours before the occurrence. Failure to rescue happens when these signs are not recognized, and appropriate action is not taken to stabilize the patient. According to Moldenhauer, Sable, Chu, and Mehler (2009), there are four FTR processes that occur: “(a) failure to recognize clinical deterioration, (b) failure to communicate and escalate concerns, (c) failure to physically assess the patient, and (d) failure to diagnose and treat

appropriately” (p. 165). Nurses are instrumental in addressing this national crisis by recognizing patient assessment indicators of an impending crisis more quickly. Garvey (2015) developed visual bell curves for nurses to use as tools to more quickly recognize impending signs and symptoms of doom related to neurologic, respiratory, and cardiac demise. Nurses are vital in the promotion of patient safety as they work at the patient’s bedside for extended periods of time. This continuous presence places nurses in an advantageous position to demonstrate CT through the recognition of the signs of clinical deterioration and take action promptly to prevent potential complications.

Other Types of Errors. Morrow (2009) addressed documentation errors, not following policies and procedures, poor understanding of equipment, inadequate communications with health care providers, and not asking questions when help was needed as other reasons for errors in novice nurses. In fact, the pressures new nurses face are so immense that the attrition rate of new graduate nurses in their first year of practice ranges between 30-60% internationally (Goodare, 2015). The findings reported by Goodare (2015) stated the most significant time of stress for the student nurse is in the clinical practice environment. Preparing students in the clinical setting with clinical staff who are still practicing nursing and extensive orientation programs for graduates are vital to the successful socialization of the professional role. The first year as a professional nurse is often accompanied by transition shock (Duchscher, 2009) as the novice nurse quickly realizes a significant gap between the acquired knowledge obtained in nursing education and lack of preparation for the demands of professional practice.

Need for Transformation in Nursing Education

Despite the education-practice gap being widely documented with various methods to improve CT, the problem continues in nursing education. King, Smith, and Glenn (2003) surveyed 11 deans of nursing programs, 82 nurse administrators, 117 nurse educators, and 23 new and 96 experienced baccalaureate nursing graduates. The results showed CT consistently among the most critical competencies for practice but ranked it as the lowest observed competency. In a national nursing education study supported by the Carnegie Foundation, Benner et al. (2010) calls for a transformation in nursing education and development of CT skills to meet the current demands of professional nursing practice to mitigate the gap between education and practice. The nursing students in the study told of the difficulties and concerns of not being prepared to move competently into the work role. Benner et al. (2010) explored the habits of exceptional cases of teaching in nursing education and made many useful recommendations to the nursing profession. The findings of the study concluded “three areas must be integrated into the identity and actions of the professional nurse: skillful ethical comportment, good clinical judgment, and use of the best scientific knowledge” (p. 231). Developing these recommendations and incorporating new strategies to develop CT skills in nursing students will be the answer in bridging the gap between theory-practice and improving patient outcomes (Benner et al., 2010).

The multidisciplinary Institute of Medicine (IOM) Report, *The Future of Nursing: Leading Change, Advancing Health* (2011) indicated the need for transformation in nursing education. The IOM recommended transformation in nursing education that includes a seamless academic progression through an improved education system that

converts the traditional content-heavy curriculum to a competency-based education. This IOM report has been a stimulus for the development of action coalitions across the United States that focuses on nurses practicing to the full scope of their knowledge and skills. The recommendations include nurses being leaders in the transformation of the health care system and achieving higher levels of education that will provide the ability to analyze data critically to improve the quality of care for patients. The current traditional teaching-learning nursing curriculum is teacher-centered and limits the development of CT (Chiang, Chapman, & Elder, 2010). The evidence-based reports on the future of nursing were supported by the Carnegie Foundation, *Educating Nurses: A Call for Radical Transformation*. Benner et al. (2010) concluded nursing courses are highly structured and focused on covering content versus CT or decision-making. Further, Benner et al. (2010) reported the current fragmented learning between the classroom and clinical education results in superficial learning. The results of the Carnegie study indicated educators must improve and change classroom teaching of nursing science to ensure safe, competent graduates. Benner et al. (2010) reported students are most often taught memorization taxonomies in the classroom and this practice, unfortunately, does not engage students or emphasize contextual teaching which is needed to develop clinical imagination or CT. This transformation will require innovative, powerful learning experiences that integrate classroom learning with direct clinical experiences to close the education-practice gap (Benner et al., 2010; Tanner, 2010).

Strategies to Transform Nursing Education

Glasgow, Niederhauser, Dunphy, and Mainous (2010) called for innovative practices in clinical education through transitioning-to-practice programs, competency-

based assessments, academic-practice partnerships, and using information technology and simulation. These recommendations stem from regulatory models proposed by the National Council of State Boards of Nursing (NCSBN) and based on the IOM report and current evidence. Many initiatives and innovations throughout the country are being implemented to promote quality and safety to close the education-practice gap. The NCSBN recognized change cannot occur unless administrative regulations are minimalized; therefore, it created an innovation in Education Regulation Committee to review proposals. Nursing leaders need to redefine practice and educational guidelines that will drive innovation in undergraduate nursing programs that will promote safety, CT, and mitigate the education-practice gap. A report from the Robert Wood Johnson Foundation (2012) stated future classrooms will be technologically equipped and extremely interactive. Students will be very engaged and active in their learning and no longer line up in chairs and have content delivered passively.

More recently, Benner (2012) noted several states, including Arizona, Minnesota, Michigan, and Washington, implemented initiatives based on the 2010 Carnegie report; however, the lack of innovation and CT continues in many nursing programs around the country (Spector & Odom, 2012). Many innovations are being seen in clinical nursing education as the result of the call for transformation. For example, groups of students may be assigned to patients with similar clinical problems, such as heart failure, and later in the clinical debriefing report compare and contrast what they learned about caring for different patients with similar clinical problems.

Furthermore, in response to the Carnegie report, many schools of nursing have engaged in curriculum revision of the foundational natural and social science courses to

enrich students' current levels of scientific knowledge required in nursing practice (Benner, 2012). The University of Pennsylvania integrated nursing practice into the first 2 years of prerequisite science courses. For example, Benner (2012) reported she observed a nurse faculty team teacher demonstrate how the anatomy and physiology of bone joints are integral to Health Assessment, and the chemistry course used knowledge on the diffusion of gases in a case of Decompression Sickness in relationship with acid-base balance and fluid shifts between intracellular and extracellular spaces. Also, the Pathophysiology and Pharmacology courses were integrated together for improved knowledge acquisition with drug actions, interactions, and introducing students to assessing patients' responses to medications. The innovative curriculum at the University of Pennsylvania is exemplary and perhaps serves as a foundation for pedagogical changes needed in nursing programs across the country to make cognitive connections and promote CT.

Critical Thinking

Background Information and Definition of Critical Thinking

The ability to use reasoned opinion focusing equally on processes and outcomes over emotions is called CT (Paul & Elder, 2008). Critical thinking skills are desired in most every discipline and play a major role in decision making and daily judgments. The roots of CT date back to Socrates 2,500 years ago and can be traced to the ancient philosopher Aristotle (Paul & Elder, 2012). Socrates challenged others by asking inquisitive questions in the attempt to challenge their knowledge. In the 1980s, CT gained nationwide recognition as a behavioral science concept in the educational system (Robert & Petersen, 2013). A simple definition of a concept is a general idea inferred or

derived from unambiguous occurrences. Many researchers in both education and nursing have attempted to define, measure, and teach CT for decades. However, a theoretical definition has yet to be accepted and established by the nursing profession (Romeo, 2010). The terms critical literacy, CT, reflective thinking, systems thinking, clinical judgment and clinical reasoning are used synonymously in the reviewed literature (Clarke & Whitney, 2009; Dykstra, 2008; Jones, 2010; Swing, 2014; Turner, 2005).

Watson and Glaser (1980) viewed CT not only as cognitive skills, but also as a combination of skills, knowledge, and attitudes. Glaser's ideas, developed as early as 1925, are now considered the cornerstones of CT. In 1964, he and colleague Watson produced the Watson-Glaser Critical Thinking Appraisal (WGCTA), designed to test CT skills: inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments (Adams et al., 1996; Robert & Petersen, 2013; Watson & Glaser, 1991).

Paul (1993), founder of the Foundation for Critical Thinking, offered several definitions of CT and identified three essential components of CT: elements of thought, intellectual standards, and affective traits. Brunt (2005) believes CT is a process of being practical and considered CT to be "the process of purposeful thinking and reflective reasoning where practitioners examine ideas, assumptions, principles, conclusions, beliefs, and actions in the contexts of nursing practice" (p. 61). In an updated definition, Ennis (2011) described CT as, "reasonable reflective thinking focused on deciding what to believe or do" (para. 1).

The most comprehensive attempt to define CT was under the direction of Facione and sponsored by the American Philosophical Association (Scheffer & Rubenfeld, 2000). In 1990, Facione surveyed 53 experts from the arts and sciences using the Delphi method

to create the following consensus statement: “We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as an explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which judgment is based” (p. 2).

To come to a consensus definition for CT, Scheffer and Rubenfeld (2000) also conducted a Delphi study. The study consisted of an international panel of nurses who completed five rounds of sequenced questions to arrive at a consensus definition. The results of the Delphi study by Scheffer and Rubenfeld (2000) defined CT as “habits of mind” and “cognitive skills.” The elements of habits of mind included “confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance, and reflection” (p. 352). The elements of cognitive skills were recognized as “analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting, and transforming knowledge” (p. 352).

Ignatavicius (2001) defined the development of CT as a long-term process that must be practiced, nurtured, and reinforced over time. Ignatavicius believed a critical thinker required six cognitive skills: interpretation, analysis, evaluation, inference, explanation, and self-regulation (Chun-Chih et al., 2015). Ignatavicius (2001) believed the development of CT is difficult to measure or describe because CT development is a formative rather than summative process. Despite the similarities in the definition of CT among researchers, there continues to be a dilemma about a unified definition of CT among health care educators (Robert & Peterson, 2013).

Need for Critical Thinking in Nursing

Despite nursing not having a concise definition of CT, the evidence from the literature is clear that CT is a required nursing competency due to the evolution of nursing into a highly technical and complex profession (Benner et al., 2010). Nurses are no longer task-oriented members of the team, but independent health care providers and the need to develop and cultivate CT skills is vital (Romeo, 2010). The professional nurse today must practice using evidence-based research abiding by the standards of care, but also be able to interpret patient preferences having moral imagination and ethical comportment (Benner, Hughes, & Sutphen, 2008). The high expectations of the nurse make creative problem-solving, continual learning, and professional accountability requisite characteristics of the profession. The literature is consistent in reporting patient care outcomes improve when nurses use evidence-based practice and think critically (Ritchie & Smith, 2015). Due to the link between patient safety and CT, the National League of Nursing mandated CT as an outcome criterion for accreditation of nursing schools in 2006 (Robert & Petersen, 2013). Although CT has been considered an essential nursing competency for many years, the ability to teach CT remains a controversial subject.

Fero et al. (2008) noted patient safety might be compromised if a nurse cannot provide clinically competent care due to a lack of CT abilities. In the hallmark Institute of Medicine report, *Crossing the Quality Chasm: A New Health System for the 21st Century* (2001), five health care competencies were recommended: patient-centered care, interdisciplinary team care, evidence-based practice, informatics, and quality improvement. Understanding the development and attainment of CT is the key to gaining

these future competencies (Scheffer & Rubenfeld, 2000). The development of a strong science foundation for nursing practice depends on habits such as contextual perspective, inquisitiveness, creativity, analysis, and reasoning skills. Therefore, the need to better understand how these CT habits are developed in nursing students needs to be explored through additional research (Fero et al., 2008). Despite CT being listed since the 1980's as an accreditation outcome criteria for baccalaureate programs by the National League for Nursing, very little improvement has been observed in practice (McMullen & McMullen, 2009). In fact, Dolansky and Moore (2013) report since the Institute of Medicine reports, *Crossing the Quality Chasm* (2001) and the famous *To Err Is Human* (2000) report dropped a bombshell on the medical community by reporting up to 98,000 people per year die because of preventable mistakes in hospitals, only slight improvements in safety and quality have been reported in this past decade.

James (2013) reported the number of patient harm incidents associated with hospital care is much higher than previously thought. James' study indicated between 210,000 and 440,000 patients each year go to the hospital for care and end up suffering some preventable harm that contributes to their death (James, 2013). This study of preventable errors is apparently attributed to other sources besides nursing care, but having a nurse in place who can advocate and critically think for patients will make a positive impact on improving patient safety (James, 2013; Robert & Peterson, 2013).

The importance for nurses to integrate CT into their practice cannot be understated. The significance of good CT skills directly relates to initiating appropriate treatments, managing complications, and the prevention of adverse patient outcomes from failure to rescue (Kuiper, 2013). Nurses on the front lines of care with patients day

and night are charged with monitoring the results of their own and others' interventions. A typical example is seen in a health care provider's order for medication. The nurse must follow a process of thinking that includes assessment, monitoring previous trends of effectiveness, knowing side effects, interactions, indications, and patient preferences. This process of thinking involves many actions and judgments in individual patient scenarios that may lead to holding the medication or questioning the order. By taking action, the nurse promotes safe patient care and demonstrates CT skills (Benner, 2001). Therefore, the demand for transformation in nursing education must be met by innovative teaching strategies that promote CT in students to minimize the education- practice gap and promotes patient safety (Benner et al., 2010).

Variables Affecting Critical Thinking

Although several attributing factors of learning and developing CT are common, those factors are often overlooked in the evaluation process (Swing, 2014). Attributing factors may include motivation, attitude, anxiety, age, confidence, and the commitment of faculty and students. Several internal and external factors have been cited as affecting the development of CT (Killam et al., 2011).

Nurse educators and their involvement in the teaching-learning process are principal in shaping the quality of learning experiences and development of CT in students. Educators who work closely with students in the clinical setting often promote a shared responsibility for patient safety, creating a non-threatening environment for discourse about potential complications (Killam et al., 2011). Students' report learning is improved when educators are knowledgeable, approachable, and respectful (Hanson & Stenvig, 2008). Educators who are successful in maintaining control of the classroom

and creating a positive academic environment have been linked to enhanced CT skills in students (Ogundokun, 2011). Ohman (2010) reported creating a festive, active environment like a Skills Fair contributes to improved knowledge as it supports all learning styles. Finally, Nibert and Troseth (2011) reported strategies to bridge the education-practice gap include more focus on faculty engagement, sharing information, integrating evidence-based clinical tools throughout the curriculum, and better leadership on education and practice transformation.

Student age and previous experience can influence CT skills either positively or negatively based on an individual's ability to reflect on experience (Swing, 2014). A study by Chau et al. (2001) used the California Critical Thinking Skills Test and found no significant correlations between age, gender, and work experience for developing CT skills in nursing students. Shinnick and Woo (2013) used the Health Science Reasoning Test and found age positively predicted total CT skills' scores, while previous employment in a health care setting and gender were not significant. Therefore, despite one's age, a person needs to demonstrate a healthy ability to think rationally to determine if outcomes are met and subsequently reflect on experiences in order to develop CT skills (Swing, 2014).

Need to Measure Critical Thinking

The lack of uniform concept and definition of CT can make measuring and evaluating CT skills challenging (Nair & Stamler, 2013). Consequently, the inconsistencies with familiar CT tools such as the California Critical Thinking Skills Test and the Watson-Glaser Critical Thinking Appraisal Tool have also been noted in studies

(Swing, 2014; Jenkins, 2011). However, measuring and evaluating CT skills is fundamental to safe patient care.

Facione (2015) found existing tools measure simple CT skills, but do not measure context-dependent situations that are routine in nursing practice. Therefore, there is a significant need for further research in nursing education to understand the development of CT in nursing students (Facione, 2015). Although researchers have studied various teaching strategies and tools that best reflect CT, the call for transforming nursing education today has never been louder (Spector & Odom, 2012).

Nursing education must be redesigned to prepare new nurses as the complexities of care have changed. For example, technological innovations, health care reform, the aging population, and the nursing care shifts from acute care settings to communities, all require a new kind of nurse who has the ability to think critically. Those listed challenges will require a transformation of nursing education (Tanner, 2010). Also, nurse educators must modify the way they currently teach as students want to be engaged and taught key theoretical concepts that can be applied directly to practice (Stanley & Dougherty, 2010). Nursing practice and education are at a crossroads due to significant changes in health care delivery (Tanner, 2010). As a result, innovation in education is needed to be able to understand better how nursing students think and adequately prepare them for emerging challenges (Newton & Moore, 2013).

A systemic review of the literature by Carter, Creedy, and Sidebotham (2016) studied the efficacy of teaching methods used to develop CT in nursing undergraduate students in hopes to promote best practice teaching strategies. All 28 of the studies reviewed involved the measurement of CT development. The educational interventions

were diverse and included problem-based learning, simulation, concept mapping, evidence-based practice, and reflection. Sixteen various tools were used to measure CT in the study. The studies used the California Critical Thinking Disposition Inventory, the California Critical Thinking Skills Test, or the Health Services Reasoning Test. The researchers reported limited reliability of these three tools to measure CT from a previous systematic review of tools. The researchers' findings argued these general CT tools were unlikely to identify interventions to improve CT abilities of nursing students. The recommendations from the study included discipline-specific strategies and tools to measure CT in nursing students while in clinical practice.

Due to the inconsistencies of familiar CT tools such as the California Critical Thinking Skills Test and the Watson-Glaser Critical Thinking Appraisal Tool, I chose to use the Kaplan Critical Thinking Integrated Test (KCTIT) for this research. I believe this tool was best for this study as the Kaplan standardized exams have been used for almost a decade by many schools of nursing to determine student progression and graduation eligibility (Frank, 2016). Many schools of nursing purchase standardized testing packages to prepare students for the National Council Licensure Examination for registered nurses (NCLEX-RN).

Kaplan Test Prep is a subsidiary of The Washington Post Company and was established in 1938 (Wolters Kluwer, 2006). In 2002, Kaplan Nursing launched a proprietary, integrated testing program designed to evaluate students' progress through the nursing curriculum (Kaplan, 2002). Kaplan Nursing offers standardized tests, including entrance exams for various schools. Kaplan tests provide timely, detailed feedback with recommended student remediation for each test. Students' performance in

areas such as CT and the nursing process are added benefits for schools to implement the standardized testing program. In addition, faculty receive an aggregate school report for each test. In 2006, Kaplan Test Prep joined with new partners Lippincott, Williams, and Wilkins, to offer a complete program of Integrated Testing with remediation and licensing preparation for nursing students. This collaboration allowed Kaplan Test Prep the ability to offer more than 80 standardized tests worldwide (Wolters Kluwer, 2006). The intention of nurse educators for implementing the KCTIT and other standardized content assessments is to provide a better opportunity to predict and assist struggling students (Yeom, 2013). The reason for selecting this tool to measure the level of CT skills was based on its prior use by the nursing program where the Skills Fair occurred and its ability to measure CT skills of nursing students. By having struggling students remediate early, students are able to receive the tools they need to be successful on the NCLEX-RN.

Swing (2014) used the KCTIT as the instrument in her study to determine the level of CT skills for first semester associate degree nursing students. The study focused on early program evaluation of CT in a non-experimental, explanatory, quantitative study. The KCTIT was utilized as the instrument to measure CT for the pre- and post-test to determine if a significant transformation occurred within the first semester of nursing school. The findings indicated a significant transformation in the level of CT from the beginning to the end of the first semester for these students. Recommendations from the study included examining early measurement of CT in nursing programs and including various learning strategies to develop CT skills in nursing students. This recommendation allowed adjustments of curriculum, teaching methodologies, and

consideration of learning styles to meet the needs of the students in developing needed CT skills.

Active Learning Strategies that Facilitate Critical Thinking

Adopting teaching strategies to promote CT and active learning is a crucial component of nursing education. The National Survey of Student Engagement (NSSE) reported students who are engaged in active learning are more likely to meet learning outcomes (as cited in Phillips, 2015, p. 258). The benefits of active learning by the NSSE included an enhancement of learning inside and outside of the classroom, an increase of student effort, and an increase of persistence, grade point average, and degree completion. Active learning allows learning to come alive and engage the learner (Wittmann-Price, 2013). Adding activities that stimulate all learning styles creates an environment for increased student participation. Examples of active learning include group assignments, simulation, evidence-based practice, online modules, and flipping the classroom (Phillips, 2015).

Nelson (2006) reported CT and active learning are intimately linked because CT is promoted by active learning strategies due to the cognitive triggering process. Nelson's research maintains students who are actively involved in their learning with group work and guided discussions are more likely to develop CT skills. Therefore, the challenge for nursing educators is to provide students with more opportunities to develop CT skills using active teaching strategies such as evidence-based practice, group work, and guided discussions (Kaddoura, 2013). The Skills Fair intervention is an active learning strategy that incorporated CT prompts, Socratic questioning, group work, guided discussions, return demonstrations, and blended learning in an attempt to develop CT in

nursing students (Hsu & Hsieh, 2013; Roberts et al., 2009). Research by Nadelson and Nadelson (2014) suggested evidence-based practice is best learned when integrated into multiple areas of the curriculum, rather than only a research or evidence-based practice course.

Evidence-Based Practice

Evidence-based practice developed its roots through evidence-based medicine, and the philosophical origins extend back to mid-19th century (Longton, 2014). Florence Nightingale, the pioneer of modern nursing, used evidence-based practice during the Crimean War when she recognized a connection between poor sanitary conditions and rising mortality rates of wounded soldiers (Rahman & Applebaum, 2011). In professional nursing practice today, a commonly used definition of evidence-based practice is derived from Dr. David Sackett: “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of the individual patient” (Sackett, et al., 1996, p. 71). As professional nurses, it is imperative for patient safety to remain inquisitive and ask if the care provided is based on available evidence. One of the core beliefs of the American Nephrology Nurses’ Association (ANNA’s) 2013-2015 Strategic Plan is “ANNA must support research to develop evidence-based practice, as well as to advance nursing science, and that as individual members, we must support, participate in, and apply evidence-based research that advances our skills, as well as nursing science” (p. 1). Longton (2014) reported the lack of evidence-based practice in nursing resulted in negative outcomes for patients. In fact, when evidence-based practice was implemented, changes in policies and procedures occurred that resulted in decreased reports of patient harm and associated health care costs. The IOM (2011)

recommendations included nurses being leaders in the transformation of the health care system and achieving higher levels of education that will provide the ability to critically analyze data to improve the quality of care for patients.

Sigma Theta Tau International (STTI) (2005), the honor society of nursing, has a position statement on evidence-based practice. The society defines evidence-based nursing practice as an “integration of the best evidence available, nursing expertise, and the values and preferences of the individuals, families, and communities who are served” (para. 4). The National Council of State Boards of Nursing (NCSBN) in each state serves the purpose of protecting the public which ensures nurses practice in a safe and competent manner. The NCSBN and STTI consider evidence-based practice as a foundation for safe, nursing practice. Student nurses must be taught to connect and integrate CT and evidence-based practice throughout their program of study and continue that practice throughout their career.

Profetto-McGraff (2005) discussed the relationship of evidence-based practice and CT to positive patient outcomes. The researcher reported evidence-based practice should be a required component of baccalaureate nursing education to develop independent, self-directed learners who can critically think. Being inquisitive is consistent with CT and can only thrive in a learning environment that fosters curiosity. Profetto-McGraff (2005) believes a questioning culture is needed in nursing to support the use of evidence-based practice. Profetto-McGraff (2005) reported several strategies to develop CT included a variety of writing strategies, role modeling and questioning, verbal strategies (debates, clinical rounds, and simulation), computer-assisted instruction,

concept maps, and problem-based learning. Student nurses who have the ability to utilize CT are crucial to the effective implementation of evidence-based practice.

In response to rapid innovation in nursing education, Stanley and Dougherty (2010) reported a paradigm shift in nursing education that should focus on student-centered learning that is substantiated by evidence. This change stems from the National League for Nursing's (2003) call for nursing education to respond to the changing needs of students today by providing educational opportunities that promote evidence-based practice and CT skills. Therefore, the faculty's role is to provide a dynamic and seamless curriculum founded in evidence-based practice. Also, for learning to occur and be effective, experiences must be transformed (Lisko & O'Dell, 2010). This change will allow students to become active learners in the educational setting promoting CT and habits toward lifelong learning.

Constructivist Learning Theory

Constructivist learning theory emerged from the discipline of education and drew on the developmental theories of Piaget (Brandon & All, 2010, p. 90). This learning theory is appropriate for this study because Constructivism builds on the individual's current understanding and skills by integrating new information and skills (Lim et al., 2015). This theory is student-centered, cooperative, and encompasses past knowledge and experiences that shape future learning (Bruner, 1996). Additionally, Constructivism assumes meaning and values can differ among individuals. Therefore, developing an awareness of differing interpretations among participants in nursing programs is an essential part of professional competence in a country with an increasingly diversified population (Hunter & Kranz, 2010). Students explore old and new ideas through

collaborative discourse and reflection to construct new meaning. The process of accommodating differences, connecting meaning, and continually reorganizing thinking is a basic assumption of constructivism (Brooks & Brooks, 1993; Ubbe, Black & Ausherman, 1999).

Constructivist Learning Theory was an appropriate conceptual framework for the Skills Fair intervention as it acknowledged multiple, socially constructed truths, perspectives, and active learning strategies (Guba & Lincoln, 1994). The constructivist learning conceptual framework fittingly cradled the Skills Fair intervention based on promoting CT and evidence-based practice as nursing students were reacquainted with previously learned psychomotor skills. Bruner (1996) suggested constructivist learning theory is an active process that is stimulated by curiosity. Finally, the Constructivist approach was the underlying theory for this study to better understand CT in connection with an active learning intervention like the Skills Fair intervention.

Skills Fair Intervention

An opportunity became available to add an innovative Skills Fair to a baccalaureate nursing program using the foundations of Constructivist Learning Theory. The Skills Fair melded evidence-based practice with simulated CT opportunities while students practiced essential psychomotor skills. The implementation of the Skills Fair occurred at the beginning of Fall 2015 semester to assist baccalaureate students who had taken the summer off from their studies in nursing. The previous research by Roberts et al. (2009) and McCausland and Meyers (2013) on Skills Fair interventions in nursing education were used as guides to facilitate decision making and planning for the Skills Fair. The re-acquaintance of psychomotor skills grounded in evidence-based practice

with CT opportunities was discussed as the primary objective to facilitate the development of CT in nursing students during the Skills Fair intervention.

Blended Learning

A study by Hsu and Hsieh (2013) investigated factors affecting metacognition of undergraduate nursing students in a blended learning environment. Blended learning uses online technology to supplement and improve the learning process with students being allowed to review the materials on their own time. Hsu and Hsieh (2013) described metacognition as an active process of knowing or being acutely aware of one's cognitive state while completing a task. The Teaching Excellence in Adult Literacy (TEAL) Center describes metacognition as the ability to use prior knowledge to plan a strategy to solve a problem, taking the most appropriate steps of action, reflecting, evaluating, and modifying the action as needed (Scanlon, 2012). Metacognition plays a critical role in successful learning and relevant to the development of CT for nursing students to meet the complex demands of today's healthcare environment (Hsu & Hsieh, 2013). The use of blended learning was studied because many instructors believe student satisfaction increases with a diverse delivery of instruction (Lim & Morris, 2009). The research study by Hsu and Hsieh (2013) described the benefits of blended learning as increased higher quality learning, increased student responsibility for learning, higher student satisfaction, and stronger collaboration. The active learning of the scenarios presented in the study by Hsu and Hsieh (2013), in addition to the opportunity for the exchange of ideas and subsequent reflection, was valuable to understanding metacognition. The findings revealed a strong positive correlation between student involvement and student motivation to learn. Garrison and Kanuka (2004) identified blended learning as one of

the key factors leading to higher order learning and the development of CT in nursing students. The results presented by Hsu and Hsieh (2013) was consistent with another study by Delialioglu and Yildirim (2007) who stated activity-based learning, activities that promote CT, and a mixture of instructive and constructivist elements that facilitate group discussion build metacognition in students. Delialioglu and Yildirim (2007) suggested a need for further research to examine the constructivist approach to active learning and for understanding the role of metacognition and the development of CT in nursing students. A Skills Fair intervention is cited as an active learning strategy that can occur in a blended learning environment. It is vital for educators to present methods to facilitate CT as a professional competency when developing new educational programs (Lisko & O'Dell, 2010). The Skills Fair intervention in this study adopted blended learning to improve learning and promote CT of senior baccalaureate nursing students.

Summary

Several factors were noted in this concentrated literature review as to why new nursing graduates are identified as lacking CT skills that are directly related to the education-practice gap. In this chapter, I provided a review of the literature regarding CT with a focus on the lack of CT, the education-practice gap, errors in nursing practice, and the need for transformation in nursing education with specific strategies to transform nursing education. Background information with the definition of CT, the need for CT in nursing, and the measurement of CT are also described. Finally, active learning strategies to facilitate CT including evidence-based practice, Constructivist Learning Theory, and the Skills Fair intervention using blended learning are discussed in Chapter 2.

The need to help nursing students develop CT has never been greater. However, the lack of consistent meaning of CT makes that more challenging for faculty, students, and nurses who make educational decisions and evaluate CT. The benefits of CT abilities are vast in nursing and can directly impact patient outcomes (Saintsing et al., 2011). Therefore, nursing education must change their current methods of teaching and be innovative with curricula transformation. The teaching strategies discussed in the literature indicated active learning helps nursing students develop CT. Those activities include evidence-based practice, CT prompts, Socratic questioning, group work, guided discussions, expert demonstration followed by guided practice, and blended learning (Hsu & Hsieh, 2013; Roberts et al., 2009). The activities that promote CT were incorporated into the Skills Fair intervention at the research site. Nursing curricula and innovations that promote student-centered learning, CT, and evidence-based practice are vital to solving the education-practice gap. A Skills Fair intervention based upon best practices for engaging active learners is cited as a first step in the reform of nursing education (Brandon & All, 2010). Therefore, this literature review substantiates the need for this research as nursing educators transform their teaching to incorporate active, innovative teaching strategies like the Skills Fair, with aims to promote CT and minimize the education-practice gap.

Chapter III

RESEARCH METHODOLOGY

Introduction

In this case study, I examined the effects of an innovative Skills Fair intervention on senior baccalaureate nursing students' achievement and their perceptions of CT development. I compared the KCTIT post-test scores of a senior baccalaureate cohort who participated in the Skills Fair in contrast to a senior baccalaureate cohort who did not participate. I sought to understand the senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of CT skills during the Skills Fair intervention. Finally, I explored the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a CT developmental strategy.

A mixed-methods approach, combining both quantitative and qualitative approaches was used to collect data regarding CT, in addition to in-depth one-on-one interviews to better understand the context of experience. Few mixed method studies have addressed the development of CT skills in nursing (Tadoura et al., 2014). However, evidence in the literature confirmed the use of mixed methods research in health-related fields (Klassen, Creswell, Plano-Clark, Smith, & Meissner, 2012). Merriam (1988) explained case studies are differentiated from other types of research in that they are an "intensive, holistic description and analysis of a single instance, phenomenon, or social unit" (p. 21). The use of this approach utilized the combination of the strengths of each method to answer the research questions in this study.

Results of this mixed methods case study may fill a gap found in the literature to study an innovative Skills Fair intervention that was designed from the call for transformation in nursing education to help mitigate the education- practice gap. The creative Skills Fair intervention in this research implemented active learning strategies and evidence-based practice to promote CT. In Chapter 3, I provide an in-depth discussion regarding the methodology used in this study.

Purpose of the Study

As previously stated, CT skills are necessary to develop in the nursing student in order to practice safely and competently in practice. The failure to learn how to critically think affects patient safety (Killam et al., 2011). Baccalaureate nursing educators strive to create clinical, classroom, and lab learning environments where students can safely develop and practice their knowledge and skills. However, the lack of CT skills in the new nursing graduate continues to be alarming (Oermann et al., 2010). A transformation in nursing education toward active learning that promotes CT and is founded on evidence-based practice is essential to solving this issue (Stanley & Dougherty, 2010). There is a need for more studies in nursing education to support active learning strategies and the development of CT in the novice nurse (Waltz et al., 2014). The literature review suggested a Skills Fair intervention is an innovative, active learning strategy to support CT skills in nursing students (Roberts et al., 2009). The purpose of this case study was to explore the effect of an innovative Skills Fair intervention by retrospectively investigating the KCTIT post-test scores of a participant group and non-participant group, and examine the perceptions of senior baccalaureate nursing students who participated in the Skills Fair intervention. The knowledge gained from this research may help nursing

educators within nursing programs make informed decisions regarding active learning strategies in creating their own Skills Fair intervention to help strengthen CT in nursing students and decrease the education-practice gap.

Research Questions

The following are the research questions for this study:

1. What is the difference in achievement on the Kaplan Critical Thinking Integrated Test among senior baccalaureate nursing students who participated in the Skills Fair intervention and students who did not participate?
2. What are the senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of critical thinking skills during the Skills Fair intervention?
3. What are the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a critical thinking developmental strategy?

Research Design

Mixed Method – Explanatory Sequential Design

I chose the mixed methods design which consists of two distinct phases. To answer the above-mentioned research questions, two types of data were collected for this study, including students' post-test scores on the KCTIT and one-on-one interview data. Permission to collect and analyze the post-KCTIT scores on the participant group and non-participant group as well as conduct student interviews was granted by the Dean of Nursing and Health Sciences. In the explanatory sequential design, the quantitative data is collected and analyzed first (Dowding, 2013). In this study, the quantitative data and

results provided a general idea of the effects of the Skills Fair intervention on senior baccalaureate nursing students' CT achievement using the post-KCTIT scores.

Target Population and Sampling Method

Burns and Grove (2011) described the target population as individuals who meet the desired sampling criteria. The target population of the case study was senior baccalaureate nursing students who participated in a Skills Fair intervention in a nursing program located in the southeastern part of the U.S. The target population age range was between 21-30 years old, both male and female, and from diverse cultural and educational backgrounds. This population is consistent with the general population of the nursing school who held the Skills Fair intervention.

The school of nursing that held the Skills Fair intervention has four cohorts of undergraduate baccalaureate students who progress each semester through the program. The students begin the nursing program as a junior one student and then advance to a junior two, senior one, and finally a senior two student. Three separate undergraduate baccalaureate nursing cohorts attended the innovative Fall 2015 Skills Fair intervention, totaling 104 students: 68 senior one students and 36 junior two students. Three separate cohorts attended the Fall 2016 Skills Fair, totaling 184 students: 30 senior two students, 78 senior one students, and 76 junior two students. The 2016 Skills Fair was implemented as a mirror image of the 2015 Skills Fair intervention due to positive participant and faculty reports. Although a large number of undergraduate students participated in the Skills Fair, various factors affected the selection of participants for this case study.

The different factors affecting the selection of participants included senior students who attended the Skills Fair intervention twice and took the post-KCTIT within 3 months of intervention. Other factors affecting non-participant selection of undergraduate students who attended the Skills Fair included students who were initially part of the December 2016 (participant) cohort but did not take the post-KCTIT, students who were “off-track” in program due to one course failure or withdrawing from a course, and students who failed out of the program due to two course failures. Thirty senior baccalaureate nursing students met the criteria above to participate in the study. The selected students’ KCTIT post-test scores were used to answer Research Question 1. The 30 senior baccalaureate nursing students who attended the Skills Fair intervention twice was compared against 22 senior students who never participated in the Skills Fair intervention.

The qualitative data from the one-on-one interviews from the participant group provided data to answer Research Questions 2 and 3. The collected interview data added valuable information to the study regarding the perceptions of senior baccalaureate nursing students’ perceptions affecting the development of CT after participating in the Skills Fair intervention. More specifically, the qualitative data helped to 1) better explain the received quantitative data, 2) explore internal and external factors impacting the development of CT skills during the Skills Fair intervention, and 3) understand student perceptions of using the Skills Fair intervention as a CT developmental strategy.

Quantitative Data

Research Question 1. What is the difference in achievement on the Kaplan Critical Thinking Integrated Test among senior baccalaureate nursing students who participated in the Skills Fair intervention and students who did not participate?

Quantitative analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 20.0. The level of significance, alpha, was set at .05 due to the probability of a Type I error.

The null hypothesis stated there would be no difference between the means in post-test scores on the KCTIT for senior nursing students who participated in the Skills Fair intervention in comparison to senior nursing students who did not participate. This research hypothesized senior nursing students who participated in the Skills Fair intervention would have higher CT achievement scores on the post-KCTIT in comparison to senior nursing students' scores who did not participate (Salkind, 2007).

Specific inclusion and exclusion criteria of the senior nursing students were considered carefully. The sample size for Research Question 1 was based on the number of students in each cohort who took the post-KCTIT as a senior nursing student. The sample size for Research Question 1 was a participant group of 30 students and a non-participant group of 22 students. The independent means *t* test was used to answer Research Question 1. The assumptions to consider for the independent means *t* test include the two groups being compared should be independent of each other, the scores should normally be distributed, the dependent variable must be measured on an interval scale, the independent variable should have only two discrete levels, and homogeneity of variance (Cronk, 2012). This data provided an evaluative answer as to whether there was

a significant difference between the means in post-test scores on the KCTIT for senior baccalaureate nursing students who participated in the Skills Fair intervention in comparison to senior nursing students who did not.

Qualitative Data

Research Question 2. What are the senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of critical thinking skills during the Skills Fair intervention?

Research Question 3. What are the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a critical thinking developmental strategy?

I contacted the 30 senior students via e-mail who participated in the Skills Fair intervention twice and explained the need for qualitative data to bring better understanding of factors impacting the development of CT during the Skills Fair intervention. Maxwell (2005) explained the aim of qualitative research is to seek to understand how the process affects the participants and discussed purposeful selection as a viable option for collecting data for qualitative research. Maxwell explained one goal of purposeful selection is "...to establish particular comparisons to illuminate the reasons for differences between settings or individuals" (p. 90). The participants chosen to be interviewed were purposefully selected based on a range of high achievers and low achievers on the post-KCTIT exam. The estimated number of interviewees was ten including five high achievers and five low achievers, but I continued interviews until content saturation ensued, resulting in 11 one-on-one interviews. This selection method ensured a broader perspective of responses making the data more meaningful.

The methods used to collect the qualitative data included interviews with open-ended questions and audio recording of interviews. Only the participants and I were present during the interview sessions and participants were informed that direct quotations would be used to support the findings of the study. To help put the participants at ease, a few minutes were spent in informal conversation about the students' current nursing courses and plans for the future before the interviews and recordings began. As part of the informed process, I read the consent statements to each participant as part of the audio-taped interviews. Follow-up questions were asked when necessary to obtain the most detailed descriptions from the participants. The recordings were transcribed, as soon as possible following the interview, and permanently destroyed. The transcribed notes were kept and will remain locked in my office cabinet for a minimum of 3 years. By using one-on-one interviews, I was able to obtain information not available using statistical data alone. The interviews were coded according to the qualitative process of arranging information in a systematic order. This process permits data to be grouped and consolidated with a view to identifying substantive or descriptive categories to make meaning of experiences (Saldana, 2009). I began this process by listening to each interview recording again and memoing on key ideas before transcription. I used memos as a method to facilitate CT to develop theory, to reflect, and to make connections and comparisons in the data to help me make sense of it. Using an inductive content analysis, I used headings and subheadings based on similar comments to develop central themes and patterns. I wrote notes about each heading with a descriptive account of each topic. The audio transcripts were listened to a second time for accuracy in reporting. After I gained experience with hard-copy coding, I applied that

experiential knowledge by working with Computer Assisted Qualitative Data Analysis Software (CAQDAS). The CAQDAS software did not actually code the data, but it efficiently stored and organized the data to allow for reflection (Saldana, 2009).

Skills Fair Intervention

The School of Nursing used rubrics for student clinical evaluation for many years, but the rubrics did not contain evidence-based practice and CT prompts. Oermann et al. (2011) reported while practicing psychomotor skills repetitively builds skill competence, CT can only be developed by focusing on decision-making and the evidence behind motor skills. Rubrics are used in health professions to promote consistency in scoring among faculty and provide a learner-centered assessment approach that encourages behavioral change for incorrect technique (Boateng, Bass, Blaszak, & Farrar, 2009). A major component of the clinical experience in nursing education provides an opportunity for performance-based assessments regarding psychomotor skills in the skills lab and rubrics are used to objectively assess performance. Excellent evidence-based practice is based on the health care providers' ability to assess information critically and determine the relevance of that information for practice (Nadelson & Nadelson, 2014). Evidence-based practice supports nursing care and contributes positively to patient outcomes across a variety of settings (Nadelson & Nadelson, 2014). The most direct way to teach CT is to understand the relevance of evidence-based practice when teaching clinicians (Profetto-McGrath, 2005). Therefore, evidence-base nursing practice is a vital component of developing CT in nursing practice (ASRN, 2007).

The Skills Fair rubrics for each skill and station were modified to include evidence-based practice and CT prompts. The rubrics, scheduling, and instructions were

shared electronically with students and faculty before the Skills Fair to ensure adequate preparation and continuous resource availability. I used the blended learning approach by sending students the online Skills Fair resources to help develop metacognition which is related to developing CT skills by implementing active learning strategies, i.e., evidence-based practice, CT prompts, Socratic questioning, group work, guided discussions, and expert demonstration followed by guided practice (Hsu & Hsieh, 2013; Roberts et al., 2009). The continued access digitally to the evidence-based rubrics and resources from the Skills Fair is valuable as the students move forward into their future clinical settings. The Dean and School of Nursing faculty volunteered to participate in the Skills Fair utilizing the active learning strategies mentioned above to prepare students for the clinical experience while promoting CT. Students were scheduled and placed randomly into eight teams based on attributes of CT as described by Wittmann-Price (2013): Team A - Perseverance, Team B - Flexibility, Team C - Confidence, Team D - Creativity, Team E - Inquisitiveness, Team F - Reflection, Team G - Analyzing, and Team H - Intuition (see Appendix E). The students were randomly placed into the eight teams based on the alphabetical order of their surname. Once the students were in teams, the students received color-coded index cards with their name and CT attribute listed. The students received a color-coded sticker to place on their index card after completing each of the eight stations. The students were instructed to consider their CT attribute and connection to nursing practice before and after the Skills Fair intervention. Definitions of each CT attribute were placed on a trifold cardboard display at the Skills Fair entrance for the nursing students. The use of the CT attributes for student group names was an important aspect of the Skills Fair because it forced students to consider their attribute

while participating in the Fair. Thinking critically like a nurse is a benchmark of professional competence and student performance (Wittmann-Price, 2013). The students rotated every 20 minutes through eight stations: Medication Administration: Intramuscular and Subcutaneous Injections, Initiating Intravenous Therapy, 10-minute Focused Physical Assessment, Foley Catheter Insertion, Nasogastric Intubation, Skin Assessment/Braden Score and Restraints, Vital Signs, and a Safety Station. When the students completed all eight stations, they went to the “Check-Out” booth to complete a simple evaluation to determine their perceptions of effectiveness of the innovative intervention (see Appendix F). When the evaluations were complete, each of the eight CT attribute teams placed their index cards into a hat and a student won a small prize. All senior students were required to attend the Skills Fair either in Session 1 from 9am-12pm or Session 2 from 1pm-4pm. The Skills Fair Team strove to make the event as festive as possible, engaging nursing students with balloons, candy, tri-boards, signs, and fun pre- and post-activities.

Instrumentation

Kaplan Critical Thinking Integrated Test

Students must be evaluated using an established CT assessment that has demonstrated a high level of internal consistency (Kowalczyk, 2011). The nursing literature does not support the use of one particular CT assessment tool. In fact, the two most popular instruments for CT research, the Watson-Glaser Critical Thinking Appraisal and the California Critical Thinking Skills Test have been criticized in the literature as they are not discipline specific and have shown no significant differences in pre- and post-test program mean scores questioning their validity (Daly, 2001; Hassan &

Madhum, 2007). The largest criticism of these two tools is they do not accurately measure the CT skills of the unique nursing population (Mortellaro, 2015). Therefore, the instrument used to measure CT was the Kaplan Critical Thinking Integrated Test (KCTIT). The rationale for choosing the KCTIT was because this tool can identify any change in the level of CT from the beginning to the end of the baccalaureate nursing program (Swing, 2014). In addition, students in the nursing program where the Skills Fair intervention occurred are given the KCTIT during their first semester of nursing school and again during their last semester. Therefore, for this study, I examined the post-KCTIT scores of the participant group in comparison to the non-participant group. The participant group and non-participant group were as similar as possible for comparison as both groups included senior two students with similar demographics from the same baccalaureate nursing program.

The KCTIT scores are continuous internal variable, with a range of 0-100%. These standardized assessments receive rigorous statistical analysis using the Rasch measurement protocol (Kaplan, 2014). The Rasch analysis is applied to assessments in a wide variety of disciplines to summarize student scores of test items to measure a single variable, often referred to as a unidimensional variable (Anselmi, Vidotto, Bettinardi, & Bertolotti, 2015). The application of the Rasch model on the KCTIT allows for the measurement of change in CT to be more accurate at an individual level (Kaplan, 2014).

The rationale for selecting this tool to measure the level of CT skills is based on its prior use by the nursing program and its ability to measure CT skills of nursing students. The KCTIT was used to measure gained knowledge after experiencing the Skills Fair (Kaplan, 2012). The knowledge gained from this research may help nursing

educators within nursing programs make informed decisions regarding active learning strategies to strengthen CT in nursing students.

The KCTIT has been in use for approximately 8 years with baccalaureate nursing programs nationwide. The test is a computerized 85-item exam in which 85 equates to 100%, making each question worth one point. The KCTIT is a secure, proctored exam that students pay Kaplan directly to administer as required by nursing programs.

Therefore, I am not able to provide a complete copy of the KCTIT for this study.

However, questions from a similar Kaplan exam that involves CT will be substituted as an example, as previously noted in Appendix B. The percentile rank was assessed to determine students' success on the KCTIT as it took into account the difficulty level of the test (Kaplan, 2012). Additionally, the exam is one-dimensional, and analyzed routinely to ensure evidence-based validity and reliability (Kaplan, 2012).

Kaplan determined the reliability of the KCTIT by conducting a nationwide study (Kaplan, 2012). The test developers collaborated with subject matter experts to ensure the validity of the KCTIT. A panel of nursing faculty and experts across the U.S. determined the test items and course content reflected CT by comparing test blueprints (Kaplan, 2012). The reliability of test was controlled by studying nursing students' in various nursing programs and dispersed geographically across the U.S. with population sizes from 250-800. The test scores were analyzed using the SPSS program to measure Cronbach's Alpha (KR-20) to measure the reliability of the KCTIT ranging from 0.72 to 0.89, which indicated the items discriminated well and were internally consistent (Swing, 2014). Also, the participants in the study accurately represented the population of nursing students nationwide and norming was conducted on the data from exam scores.

Finally, predictive validity was assessed by comparing students' test scores in contrast to the success rate in nursing school (Swing, 2014). Kaplan continues to perform item analyses on each exam that is administered and returned to the company for a composite report of the aggregate data to ensure the reliability of the KCTIT.

Researcher's Position Statement

I have been a professional nurse for 23 years and a nurse educator for the past 7 years. I have observed the lack of CT among nursing graduates for many years and found this deeply troubling; especially when related to patient safety. Additionally, I have noted the lack of students making connections between classroom teaching and clinical experiences based on outdated, passive teaching practices. The stated problems in this study and nursing education are very disturbing to me as well as other colleagues in the nursing program where I am employed. These issues were the impetus that led me to examine the literature regarding research findings to promote CT skills. The literature review prompted the development of the innovative Skills Fair intervention that I created and led with a team of three other colleagues. My opinion was that the Skills Fair intervention would promote the development of CT skills in nursing students. However, I did not allow my opinion to affect the analysis of the data collection.

To ensure rigorous research, the knowledge gained in both classroom and qualitative field work assignments were used for data analysis. Throughout the doctoral program, I was exposed to qualitative research and participated in the advanced course. I analyzed data during field work and interview assignments in those courses based on Patton (2002) to develop codes and categories putting aside all subjectivity. Using this process, I was able to open-code the interview transcript texts by defining concepts and

categories to recognize relationships between themes. I analyzed the transcripts using content analysis in accordance with the approach proposed by Granheim and Lundman (2004) and Saldana (2009). Content analysis is an inductive approach used for assessing the experiences and perceptions on a given issue. Interviews were audio-recorded and transcribed verbatim immediately after each interview (Polit & Beck, 2014). Each transcript was read several times to generate a common understanding of participants' responses. Units of meaning were derived and coded into categories based on similarities and differences in participants' responses. I wrote notes about each category with a descriptive account of each theme. Finally, I listened to the interview transcripts for a second time to ensure accuracy in reporting while referencing my notes to complete findings. Due to my limited experience with analyzing qualitative data, an expert coded a transcript with me to establish inter-coder reliability before I analyzed subsequent transcripts. The Dean of the College of Nursing and Health Sciences where I am employed served as the expert to help me with inter-coder reliability. After agreeing to keep the data confident and anonymous, the expert met with me to code the initial transcript. We read the transcript several times and assigned a code to significant units of text that corresponded with answering the research questions. The data and conclusions that I collected were compared with the expert's findings. The expert asked clarifying questions and provided thoughts on broadening or limiting identified codes until consensus occurred. Using an inductive content analysis, the codes were compared based on differences and similarities and sorted into subcategories and categories. Then, we used headings and subheadings based on similar comments to develop central themes and patterns. The purpose of having the data analyzed jointly by two researchers was to

increase dependability, conformability, and credibility of the findings (Granheim & Lundman, 2004).

For this study, a qualitative research package, CAQDAS software was used to assist in the process of data management to identify recurring themes and patterns to cluster data collected. The interview questions for this study (see Appendix G) were developed to better understand the senior baccalaureate nursing student's perceptions of internal and external factors impacting the development of critical thinking skills during the Skills Fair intervention. In addition, the interview questions were developed to better understand the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a CT developmental strategy. Interview Questions 1-3 helped me understand the student perceptions and definitions of CT, and how CT was promoted during the Skills Fair. Questions 4-6 helped me understand the attributes students perceive in others who critically think, students described a specific situation during the Skills Fair where they used CT, and whether prompting was needed. Questions 7-10 helped me investigate various internal and external factors that affected or impeded the development of CT during the Skills Fair. Finally, Questions 11-13 helped me understand the students' value of CT and why CT is important to them, what helps students value CT, and their perception of the Skills Fair as a CT developmental strategy. The nursing expert and I maintained confidentiality throughout the study. I completed the final coding, analysis, and in-depth review of the interview data after the nursing expert assessed my capability. This capability was verified by the nursing expert by coding transcriptions using inter-coder reliability.

Instrument Validity and Reliability

Internal Validity. The KCTIT was the instrument of choice to collect the quantitative data in this study to answer Research Question 1. Privacy of KCTIT exam scores was maintained by Kaplan with a secure password for faculty access via computer. There was not a conflict of interest in this study. I was the principal investigator in the study and the only person with access to the respondent's raw data. I understood the rights of nursing students to refuse participation in the study, and no one was coerced to participate. Anonymity was maintained during the data collection by not associating identifying materials with the respondents or the school attended. Confidentiality was preserved by using a private interview space for each participant and strict adherence to data protection. I also issued each participant a unique identifier - as opposed to recording names. All identifying data for the nursing student participants is preserved in a secure, locked filing cabinet in my office. The collected demographic data including age, gender, and ethnicity will be securely kept for 3 years after the completion of the study and then destroyed in a shredding machine. The results of the study will be utilized for educational and academic purposes (e.g., professional publication or presentation) only and with no identifying information disseminated.

The same proctor was present for all of the KCTIT exams given to the students, and the exams were completed without assistance from the proctor or other nursing students. Faculty members were not present during the KCTIT testing to control the possibility of student anxiety. To maintain anonymity and confidentiality, only the proctor knew of the day, time, and students who participated in the KCTIT. Each participant logged off the computer and left the room when the exam was complete.

External Validity. The potential for the case study findings may be generalized to senior nursing students in any BSN program if the program utilizes semesters versus quarters, has a diversified student population, is accredited, and utilizes evidence-based practice and CT to host a Skills Fair intervention (Swing, 2014). I adopted a mixed methods explanatory sequential design using the post-KCTIT results from senior nursing students who participated in the Skills Fair; in addition to comparing those results to a senior cohort who did not participate. The qualitative data included one-on-one interviews with 11 senior nursing students who took part in the Skills Fair intervention. Maintaining the confidentiality of the students in the study and providing a secure testing environment supports the reliability and validity of the findings. Finally, the results of this study may be applied to other Skills Fair interventions in similar settings.

Reliability. The reliability of the KCTIT to gain quantitative data to answer Research Question 1 was gained through a nationwide study of various nursing students' (Kaplan, 2012). The reliability value of the KCTIT ranged from 0.72 to 0.89. Inter-coder reliability was used to establish reliability of the qualitative data collected to answer Research Questions 2 and 3.

Procedures and Data Collection

Setting and Informed Consent

The subjects for the study are senior nursing students in a Commission on Collegiate Nursing Education (CCNE) accredited baccalaureate nursing program in a public university located in the southeastern part of the United States. The setting of the Skills Fair was held in three simulation labs in close proximity. The Dean, Associate Dean, and faculty participated in the Skills Fair intervention. This faculty group was

chosen for this study because of their expertise in nursing knowledge and CT.

Institutional Review Board (IRB) approval was obtained from Valdosta State University to protect human subject rights. The informed consent for interview followed standard IRB requirements: explaining the study, inclusion criteria, assured anonymity, risks and benefits of participation, and researcher contact information (Kim, 2012). The length of time for the interview was clearly explained in the consent statement and was limited to 60 minutes. Participants were informed clarification interviews may need to be conducted if there is any inexplicit information in the first interview to ensure respondent validation. Additionally, students were informed their participation in the interview was voluntary.

Data Collection

The quantitative part of this study was conducted using the post-KCTIT scores. The tests and scores are maintained by Kaplan and available to faculty using a protected password to guarantee exam security. I have computer access to the post-tests of all nursing students who have taken the KCTIT. Kaplan is advised of test dates for the KCTIT and the number of participants in order to get the exam loaded in time for the students (Kaplan, 2012). Each nursing student is expected to have a basic knowledge of using a computer. A piece of paper and pencil to use during the KCTIT was distributed to each participant and taken up by the proctor after the exam to prevent exam compromise. To maintain integrity, Kaplan requires an approved proctor by the School of Nursing to administer the KCTIT. An information session with instructions for proctoring Kaplan exams is required by Kaplan and the School of Nursing to maintain best practices for testing. This study was conducted in collaboration with the Kaplan

Testing program. I contacted Dr. Susan Sanders, Vice President of Kaplan Nursing and author of Kaplan Integrated Testing Program Faculty Manual to assist with information needed from Kaplan regarding data collection.

After quantitative data collection, a letter of invitation via e-mail was sent to post-KCTIT high and low achievers who attended the Skills Fair intervention. The letter contained an explanation for the need for qualitative data to bring better understanding of factors influencing the development of CT during the Skills Fair. Eleven selected participants volunteered to be interviewed. The criteria for participants were based on a range of six high achievers and five low achievers on the post-KCTIT exam. The informed consent forms were initialed by the participants after hearing the informed consent statement, and I collected them prior to the interview. The participants were aware the interviews would be digitally recorded. Each interview was conducted individually, and lasted for about 60 minutes. An open-ended interview protocol was used to guide the flow of data collection. All digital recordings were immediately transcribed in Microsoft Word for data analysis.

Data Analysis

Inductive content analysis was used to guide the data analysis process. In an inductive approach, codes and themes are data-driven (Saldana, 2009). Codes are defined as labels assigned to excerpts in the data to summarize the essence of the excerpt (Graneheim & Lundman, 2003). Themes are defined as the outcome of codes that address the research questions (Saldana, 2009).

To perform the analysis, the first phase was to conduct initial coding (Saldana, 2009). The main goal of initial coding was to identify patterns derived from the data. I

listened to the digital recordings of the interviews, and wrote memos containing data relevant to addressing the research questions. I then closely read the transcribed data line by line. In close reading of the transcripts, I was able to identify data that were relevant in addressing the research questions. Memos were also written to facilitate coding. Coding was a cyclical process; therefore, the transcripts were read and reviewed several times until patterns in the data appeared.

The second phase of coding involved focused coding to be able to synthesize the patterns in the data to be able to generate themes. Again, coding was a cyclical process. I went back to the transcripts to compare the codes with the actual data. At this point, codes were also categorized according to content. The categories were synthesized, and themes were generated to address the research questions.

Evidence of Trustworthiness

Methods of credibility, confirmability, dependability, and transferability were applied to increase the trustworthiness of this study (Graneheim & Lundman, 2003). First, reflexivity was observed through keeping journals and memos. This practice allowed me to reflect on my personal views to minimize bias. Data saturation was reached through following the recommended number of participants, as well as repeated immersion in the data during analysis until no new data surfaced. Member checking was accomplished through returning the transcript and the interpretation to the participants to check the accuracy and truthfulness of the findings. Finally, proper documentation was conducted to allow accurate cross-referencing throughout the study.

The following are detailed steps for the implementation of this study:

1. I obtained permission to conduct the study from the Dean of College of Nursing and Health Sciences to access the KCTIT scores and conduct student interviews. We discussed the need to utilize the Kaplan Critical Thinking Integrated Test (KCTIT) scores, timeline, sample population, and data collection procedures.

2. Once permission was granted from the identified nursing program, I wrote the proposal to be approved by dissertation chair, researcher, and committee members. Once the proposal was successfully defended, I obtained approval from the university's Institutional Review Board.

3. The participants in the study attended the Skills Fair August 17, 2015, and the Skills Fair August 15, 2016, to reacquaint students to nursing skills after resting all summer. Therefore, the quantitative data collection was retrospective in order to study the effects of the intervention and answer the first research question.

4. Once IRB approval was obtained, the data from the post-KCTIT scores of study participants was placed on an Excel spreadsheet. I used SPSS for the analysis.

5. Once the quantitative analysis was complete, I contacted a range of high achievers and low achievers on the post-KCTIT exam. The estimated number of interviewees was 10, but I continued one-on-one interviews until content saturation ensued.

Ethical Considerations

Appropriate ethical decisions should be made by researchers when collecting both quantitative and qualitative data to prevent any harm to participants (Creswell, 2009). Research should consider protecting the confidentiality and anonymity of participants in the study and the release of details should be provided. Also, the interpretation of data

should be accurate and reliable. I was responsible for protecting the confidentiality of all data.

Summary

In this chapter, I provide the research questions, an examination of the mixed-methodology employed, and the target population and sampling method. Further examination continues with details of the Skills Fair intervention and instrumentation. This chapter also includes a discussion of validity, reliability, and ethical considerations as related to the study.

The case study described in this proposal utilized a mixed-methods, explanatory sequential research design to investigate a potential change in CT skills among senior baccalaureate nursing students after participating in an innovative Skills Fair intervention. The study incorporated senior baccalaureate nursing students' post-KCTIT scores as the instrument to collect quantitative data, followed by qualitative interviews. The purpose of the study was to explore the effect of the Skills Fair by retrospectively investigating the senior nursing students' KCTIT scores and perceptions impacting the development of CT skills during the Skills Fair intervention.

After IRB approval was obtained, purposeful sampling was utilized to choose a minimum of ten interview participants based on the quantitative results to ensure rich data collection. Only the senior students who participated in the Skills Fair intervention twice were invited to participate in the qualitative section of the study. The setting consisted of university simulation labs for the Skills Fair and computer labs for the completion of the KCTIT instrument. This chosen instrument was used to answer Research Question 1, and interview questions to answer Research Questions 2 and 3.

The quantitative data were analyzed by exporting KCTIT scores to SPSS. The open-ended interview responses were analyzed by memos, transcription, and reflection in a systematic manner prior to coding data into categories for common themes and key ideas. After the qualitative data was coded to detect patterns and themes, I utilized CAQDAS software to triangulate the findings to verify data organization for further reflection (Saldana, 2009). An in-depth analysis of the data collected is included in Chapter 4.

Chapter IV

FINDINGS

The purpose of this case study was to investigate the effects of an innovative Skills Fair intervention on senior baccalaureate nursing students' achievement and their perceptions of CT skills development. The research design for this case study was the explanatory sequential approach integrating both quantitative and qualitative data. A retrospective look at senior baccalaureate nursing student scores on the KCTIT post-test were used as quantitative data. Eleven one-on-one interviews were conducted to obtain the qualitative data. The goal was to ascertain if a significant transformation in the development of CT occurred after participating in an innovative Skills Fair intervention. These two approaches were combined to provide a more inclusive research study.

The findings of this study are presented in this chapter. Included in the introduction section are the quantitative results followed by a description of the qualitative portion of the study. Next, a description of the setting and sample, the data collection and analysis processes, and the evidence of trustworthiness are reported (Graneheim & Lundman, 2003). Following the introduction, the qualitative results are presented. After the qualitative results, the evaluation of findings are listed which include a brief discussion of the findings, in comparison to the conceptual framework. An extended discussion, however, is provided in the next chapter. Chapter 4 concludes with a summary highlighting the key points.

This study examined the following research questions:

1. What is the difference in achievement on the Kaplan Critical Thinking Integrated Test among senior baccalaureate nursing students who participated in the Skills Fair intervention and students who did not participate?

2. What are the senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of critical thinking skills during the Skills Fair intervention?

3. What are the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a critical thinking developmental strategy?

Quantitative Results

The quantitative portion of this study addressed the first research question. The research described in this study utilized the method of purposeful sampling. An independent t test was conducted to answer Research Question 1 to compare the means of post-KCTIT scores of a group of senior baccalaureate nursing students who participated in the Skills Fair against a senior cohort who did not participate. A level of significance of 0.05 was used in the test of difference. There is a significant difference if the p -value is equal or less than the level of significance value.

The descriptive statistics table in Table 1 indicated the "percent correct score" which measured the achievement post-test scores on the KCTIT between the samples in the non-participant group ($M = 67.59$, $SD = 5.81$) and the participant group ($M = 67.88$, $SD = 5.99$) were almost equal. Levene's Test for Equality of Variances revealed the variances of the achievement scores on the KCTIT of these two groups were equal ($F = 0.42$, $p = 0.52$) since its p -value was less than the level of significance value. The t -test results indicated there was no significant difference in the achievement scores on the

KCTIT between the non-participant group and participant group ($t(50) = -0.174, p = 0.86$). To investigate participants' experience and perceptions of the Skills Fair intervention, high and low achievers were chosen for interviews based on their scores on the post-KCTIT.

Table 1 *Descriptive Data of Achievement Scores on Kaplan Critical Thinking Integrated Test*

KCTIT	<i>N</i>	<i>M</i>	<i>SD</i>
Non-Participant Group	22	67.59	5.81
Participant Group	30	67.88	5.99

Qualitative Results

The qualitative portion of this study addressed the second and third research questions. The senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of CT skills during the Skills Fair intervention, and perceptions of the Skills Fair intervention as a CT developmental strategy were explored. Semi-structured open-ended questions for the one-on-one interviews were used to collect the data, and inductive content analysis was used for data analysis. Themes were generated to address the research questions. CAQDAS software was used to triangulate the findings to verify data organization for further reflection.

Setting

The study was conducted in a public university located in the southeastern part of the United States. The Skills Fair intervention was conducted in three simulation labs in

close proximity. After the collection of quantitative data, participants were purposely selected to join the one-on-one open-ended interviews based on their post-KCTIT scores. The interviews were conducted in a private, professional setting at a time convenient to the participants. Each interview session lasted about 60 minutes.

Demographic Information

Eleven senior baccalaureate nursing students who participated in the Skills Fair intervention were selected for the one-on-one interviews. Purposeful sampling was used to select the participants based on a range of high achievers and low achievers on the post-KCTIT exam. The proposed number of participants for the interviews was ten, however, 11 participants were interviewed to reach data saturation. The 11 participants included six high achievers and five low achievers on the post-KCTIT. Table 2 presents the profile of the 11 participants based on age, gender, and ethnicity.

Table 2 *Demographic Data of Interviewees*

Participant	Age	Gender	Ethnicity
1	30	F	White
2	21	F	White
3	24	F	White
4	25	F	Black
5	22	F	White
6	26	F	Black
7	22	F	White
8	23	F	White
9	23	F	Indian American
10	22	M	White
11	27	F	Black

The participants' ages ranged from 21-30 years, with an average of 24 years. One of 11 participants was male. Seven of 11 participants were White, three were Black, and one was Indian American.

This section includes the presentation of the results based on the initial and focused coding. Excerpts from the data are provided as supportive evidence to the findings. Themes were organized according to my interpretation of their relevance in addressing the research questions. Summative tables with the frequency of mentions are

included at the end of each section. The first section provides the findings from the initial coding. The second section presents the findings from the focused coding.

Initial Coding Results

This section presents the results from the initial coding. The initial findings were the result of my “first impression” of the data through repeated close reading of the transcripts. The themes were identified through memos. The findings in this section were not analyzed for relationships among the content. The generated themes were merely identified to be the central patterns among the data.

Experience and Confidence Contributed to CT Skills. During the close reading of the transcripts, I noted “confidence” and “experience” were frequently mentioned by the participants in relation to CT skill development during the Skills Fair. The participants perceived the Skills Fair intervention as a promotion of “confidence” by practicing previously learned knowledge and reinforcing it with active learning strategies. “Experience” was attributed to real life application of skills, such as in the statement of participant 10:

During the Skills Fair, you could tell the higher level students were more capable of critical thinking because of previous experiences in nursing. They have more experience in clinical situations, so they knew automatically appeared more confident and demonstrated alternative ways of thinking that work better in real life nursing - not based on simply memorizing skills from a textbook. I think the Skills Fair built everyone’s confidence up a little.

“Experience” was also attributed to age. Several participants mentioned older students tend to be confident because they have developed CT skills due to having more life experience. An example is the statement of participant 8:

I say that because usually the older students have had some medical training and so I’ve always noticed that they get stuff a lot easier. For instance, the accelerated students seem more confident and do better than compared to students in the traditional program. I personally felt more confident after participating in the Skills Fair.

Other participants attributed “experience” with higher confidence levels, higher preparedness, and lower anxiety levels with CT skills development during the Skills Fair intervention. Participant 2 mentioned:

‘Cause for me I used to run track so if I knew that was I was good and prepared - that built up my confidence so I could win that race. So, I feel like with the Skills Fair ‘cause you’re practicing, you’re building up your confidence and that helps you grow, critically think, and understand the skills and rationale even more.

Skills Fair Intervention Had a Relaxed Atmosphere. The participants perceived the Skills Fair as a relaxed, non-threatening learning environment due to the festive atmosphere. The Skills Fair intervention was also perceived as a “positive, calm learning environment” in comparison to the clinical setting, and the participants mentioned having less anxiety during Skills Fair due to the intervention “not being graded.” Participants’ believed the Skills Fair intervention should be more challenging in the future to better promote CT skills. Participant 9 said:

Overall, the Skills Fair was a good, low-key refresher of nursing skills, but I think the safety station could've been a little bit harder. I remember there wasn't a mannequin at that station. Most of the errors were obvious and because I'm a senior 2 student and know what to look for, it was too easy. I feel like if a mannequin had the wrong size blood pressure cuff on, I don't even know if I would notice that, but I feel that would make it more difficult. So I guess if we're gonna do the stations with senior 1's and senior 2's again, maybe make it a little more difficult. I feel like those were good scenarios for the junior 1's and junior 2's in the Skills Fair, but I want my brain to be tested even more. I think the Skills Fair was fun and reinforced my critical thinking skills, but it did not change them much.

Participant 7 mentioned:

During the Skills Fair we were doing skills and practicing without stress, but when you are put in that real-life situation, you forget little things. The Skills Fair was fun and in a calm environment and helped with reinforcing skills and knowledge, but we didn't have any distractions. For instance, it is different when you have to start an IV because your patient is going into shock - versus starting an IV in the lab and only focusing on the skill. The distractions and urgency in the real clinical setting can make the experience totally different. The real-life clinical setting is what changed my perception of critical thinking. You know throughout nursing school you know that critical thinking is important, you know that it's something that you have to grasp, but it is hard to grasp it in the beginning as a new nursing student. But when you're actually on the floor, that's

when you realize how important it is to be able to think. For example, when I make a mistake or miss something important, but my preceptor catches it. You think - I knew that or I should've known that and you realize just how little you do know. I mean you know, but you don't really know, I guess.

Skills Fair Intervention Reinforced CT Skills. The Skills Fair intervention was perceived as a “refresher” especially after a long break that reinforced CT skills for many of the participants. The majority of the participants believed CT was strengthened after participating in the Skills Fair intervention. Several participants believed their perception of CT was “enhanced” or “reinforced,” rather than significantly changed.

Participant 7 said:

I don't think my critical thinking changed. I think it was enhanced more than anything. I think, like I said, we tend to forget the littlest things, and I think it's not that I've forgotten or I didn't know how to do it, it's “Oh yeah, I remember it now.” So for me personally, the Skills Fair enhanced my critical thinking, and it's reminded me to stay on my toes.

Similarly, Participant 4 mentioned her perception of CT did not dramatically change, but was reinforced after the Skills Fair. Participant 4 said:

Not necessarily changed, it has reinforced my thinking skills. Anytime I do a Skills Fair or anything like that it just makes me want to focus on something that I need to improve, so if anything, the experience reinforced what I need to work on.

Table 3 *Initial Coding Results*

Themes	Frequency of Mentions
Experience and Confidence Contributed to CT Skills	76
Skills Fair Intervention Had a Relaxed Atmosphere	23
Skills Fair Intervention Reinforced CT Skills	21

Focused Coding Results

After identifying recurring patterns in the data presented in the initial coding, this section presents the results from the second phase of data analysis. As previously mentioned, coding is a cyclical process. Therefore, I went back and forth between the two phases of coding prior to generating the themes presented below. The final themes were derived from the analysis of patterns and relationships among the content of the data using inductive content analysis (Saldana, 2009). The following was examined across the focused coding process: (1) factors impacting CT skills development during Skills Fair intervention, and (2) Skills Fair intervention as a CT skills developmental strategy.

In this section, the factors impacting CT skills development during the Skills Fair intervention are presented. The results in this segment were generated to address the second research question. Two themes were identified to address the second research question: (1) internal factors and (2) external factors.

Internal Factors. The innate characteristics of the Skills Fair participants were identified in regards to CT skills development. Confidence and anxiety levels, attitude,

and age appeared to have the most impact among the internal factors of a senior baccalaureate nursing student. Participant 1 perceived her level of confidence kept her calm, and allowed her to perform better during the assessment station; furthermore, anxiety prevented her from thinking clearly, and remembering what to do. Similarly Participant 5 said:

I think that confidence and anxiety definitely both have a huge impact on your ability to be able to really critically think. If you start getting anxious and panicking you can't think through the process like you need too. I don't really think gender or age necessarily would have anything to do with critical thinking. Moreover, higher confidence levels were also associated with lower anxiety

levels, and earlier experience with the Skills Fair. Participant 7 said:

Definitely the confidence level, I think, the more advanced you get in the program, your confidence just keeps on growing. Level of anxiety, definitely... I think the people who were in the Skills Fair for the first time, had more anxiety because they didn't really know to think, they didn't know how strict it was going to be, or if they really had to know everything by the book. I think the Skills Fair helped everyone's confidence levels, but especially the Jr. 2's.

For some participants, attitude also played a role in the development of CT skills during Skills Fair. The participants perceived having a pleasant attitude typically meant that a student was willing to learn and participate; therefore, a student was able to take the task seriously, and think seriously. Participant 6 believed attitude contributed to performance in the Skills Fair. Likewise, Participant 11 stated:

I'll say confidence for sure, confidence and level of anxiety, attitude and motivation - yes all those kind of affect how you approach and went into the Skills Fair. Like if you went into Skills Fair with a negative attitude and didn't really want to participate, then you wouldn't really learn anything - because you didn't want to be there.

Participant 11 added participation was a "big one" in terms of developing critical thinking. Participant 11 stated:

I think that's a big one for me - participation. I believe you have to participate and have the desire to learn with a good attitude or you won't gain anything from the experience. When you participate you're really like using your critical thinking skills by being actively involved.

As Participant 9 mentioned, Skills Fair intervention was scheduled "right on the first day of the semester after a long period of break," and not all students possessed the right attitude to think and learn during that time. Participant 10 similarly shared:

Some people didn't wanna be there, just because they're still on summer break mode. They were just kinda going through the motions and not really taking it seriously. Instead, they're just trying to get through the stations.

The participants also perceived age was a contributing factor to CT skills development during Skills Fair. Participant 1, as the oldest participant, said:

I feel like, certain things bring critical thinking out in you. And since I'm a little bit older than some of the other students, I have had more life experiences and am able to figure stuff out better. Older students have had more time to learn by trial and error, and this and that.

Participant 2 had the similar belief as being one of the younger students.

Participant 2 believed older students have more awareness leading to a better performance. Participant 2 stated:

Yeah, 'cause I feel like I'm so young and gullible and others are so mature.

They've been around and so I think age definitely helps you 'cause you are more aware and you can pick up on the signs earlier of something bad happening.

In addition, Participants 6, 7, and 8 believed age did have an impact on CT during Skills Fair, as she believed older students tend to have more confidence. Participant 6 said:

Well, I feel as though if I were a younger student in the nursing program, but because I am 24 years old - like say for instance if there was someone who was 21 years old; that would definitely affect the confidence in critical thinking skills. and probably the level of anxiety - I feel like the older you are, the more you realize that you sort of have to be confident when it comes to making decisions that thinking critically; whereas if you were a younger student or not as confident in some of the skills that we went over then that would affect your ability to think critically.

Among all the participants, however, Participants 3 and 9 stated they did not believe age had an effect on CT skills. Participant 9 offered no explanation for her response. Participant 3 claimed she had "friends that ranged from young to older" and had seen no difference in her friends' CT skills.

External Factors. Factors that were not inherent among the participants were also identified as factors impacting CT development during Skills Fair. The external factors

included: (1) experience and practice, (2) faculty involvement, (3) positive learning environment, and (4) faculty prompts.

Several participants cited experience in the clinical setting helped them think critically during Skills Fair. The participants were able to remember scenarios from their clinical experience, and remembered what to do and what not to do in certain situations. For instance, in the experience of Participant 2 in the IV station during Skills Fair, her clinical experience helped her assess the situation in the Skills Fair. Participant 2 narrated:

Like when I had clinical with you, you'd always tell us to know our patients medications. To always know and be prepared to answer questions - because at first as a Junior 1 we didn't do that in the clinical setting... and as a Junior 2, I didn't really have to know my medications, but with you as a Senior 1, I started to realize that the patients do ask about their meds, so I was making sure that I knew everything before they asked it. And just having more practice with IVs - at first I was really nervous, but when I got to my preceptorship - I had done so many IVs and with all of the practice, it just built up my confidence with that skill so when I performed that skill during the Fair, I was confident due to my clinical experiences and able to think and perform better.

Some of the participants also linked experience and practice with higher confidence which promoted critical thinking during Skills Fair. As such, Participant 6 stated:

I would say especially previous experience - just because again, comparing students who are seniors versus students who are semesters behind. You know

we had more experience and felt more confident in performing the skills and therefore we were able to take more time to think about critical thinking - how would this apply to patients? I kind of think the students who weren't as experienced or had confidence in the skills were more focused on - let me get through these steps and this skill, let me make sure I'm doing this right.

Participant 5 provided an example of experience impacting CT during the Skills Fair in her encounter with the safety station. Participant 5 narrated:

The one that comes to mind for me is always the patient safety station where there are things scattered on the floor, in the middle of the bed, and we have to figure out potential complications. It's always interesting to see how there are so many things that can cause problems for patients. Some of the problems in the safety station you don't really even think about as being a potential issue; and so I end up trying to guess, trying to kind of expand the way that I'm looking at the room and thinking. I think looking at everything as a whole and noting all of the potential hazards and writing them down is a great way to learn. To me, assessing and deciding - could that be a problem? That may be a problem, but I am not sure how it is a problem? I think that station was the best example of using critical thinking during the Skills Fair.

Participant 1 said hands-on experience during the Skills Fair, coupled with knowledge learned from her nursing classes, impacted CT during the Skills Fair.

Participant 1 explained:

So, let's say you have a Skills Fair rubric and you're reading the rationale - even as a senior student that just went through the Skills Fair a few months back, when

you're reading something and thinking about it, it's different than when you're actually doing it. The Skills Fair felt attempted to simulate situations as if you're doing skills on a real patient because you still have to know what you are doing, you have to pull those resources from somewhere, and you have to put everything together with what you know you should do. But in the clinical setting, you realize hands-on experience can be different from what is in the rubrics or in that specific order. The Skills Fair helped me realize the importance of hands-on experience to make more sense of our learning. I have seen that what is actually coming to fruition in the clinical setting is a lot different maybe than what we read in textbooks.

Participant 1 also shared her experience during the NG tube station in which experience helped her think critically. Participant 1 narrated:

The rationale of why you're putting an NG tube in a patient - you can explain the procedure and rationale into words the patient will understand – made me think of advocacy and patient education. Checking placement for the NG tube – also made me think of evidence-based practice at this station because some procedures are a little different depending on where you work and facility policies. I was also able to recognize relevant from irrelevant information at the safety station. I really feel there should be more of that practice, in an active setting, not on paper 'cause some people learn by doing.

Aside from experience and practice, faculty involvement was also considered as a factor impacting CT. The majority of the students perceived a familiar instructor facilitated better CT than an unfamiliar instructor. Furthermore, an involved instructor

also facilitated better CT according to the participants. The participants referred to an involved instructor who provided prompts during Skills Fair. Participant 8 stated:

I think teachers will always affect the ability to critically think just because you want get the right answer because they are there and you want to seem smart to them. [Laugh.] Also, if you are leading in the wrong direction of your thinking - they help steer you back to the right direction so I think that was very helpful.

Faculty members who provided feedback also promoted CT, as believed by Participants 1, 3, and 4. Participant 3 stated:

I thought that the faculty did a really good job of helping me not be anxious, and letting me feel like it was a safe learning environment. I felt like the critical thinking prompts by faculty and their questioning promoted critical thinking and I didn't necessarily have to be right as faculty would correct me in a constructive manner.

Finally, the participants also considered a positive learning environment as an external factor that had an impact in CT development during Skills Fair intervention. According to some participants, a positive learning environment was cultivated by the faculty. Participant 1 said:

You could tell the faculty really tried to make it more laid back and fun, so everybody would have a good experience. The faculty had a good attitude. I think making it fun and active helped keep people positive. You know if people are negative and not motivated, nothing gets accomplished. The faculty did an amazing job at making the Skills Fair a positive atmosphere.

However, for some of the participants, a positive learning environment depended on their fellow students. The students were randomly assigned alphabetically to groups and the groups were assigned to starting stations at the Skills Fair. The participants claimed some students did not want to participate and displayed cynicism towards the intervention. The participants believed their cynicism affected the positive learning environment making CT more difficult during the Skills Fair. Participant 5 stated:

I would say that probably most groups had - maybe not most, but a lot of students had negative thinking towards the Skills Fair. For instance, I noticed it when we were in the hallway doing icebreakers before it began. You could kind of hear people [laughing]. Yes, there were probably a handful of people who were like that and for my group - it made a difference. So I was just trying to ignore them and stay positive so I could something out of it.

Participant 5 added:

I would say the biggest thing that impeded critical thinking during the Skills Fair was negative thinking of students who didn't want to be there, didn't feel like it was important, and wondered why we had to do this anyway. I think that was probably one the biggest obstacles that blocked the development of critical thinking – just because when there's a negative energy in the group, it kind of hampers everyone else's ability to learn.

Participant 11 claimed the behaviors of one student affected the positive learning environment, CT, and performance of her entire group during Skills Fair intervention.

The participant stated:

I would say other student's behaviors during the Skills Fair impeded the development of critical thinking. Like, if in a group and there's one student that does not want to be there, that kind of affects the whole group because now you have to hear – "What's she saying?!" You have one bad apple, it affects the whole bunch. I feel like people pick up on that negative energy - and now, well you start to think - if they're not going to participate - do I really I have to participate? OR – do I look like an overachiever if I want to participate and critically think and try to learn?

On the other hand, Participant 9 perceived individual behaviors did not affect CT during the Skills Fair, rather it was the positive learning environment and collaboration of the entire group. Participant 9 said:

I think the positive learning environment of the Skills Fair affected critical thinking in a good way. Each of the faculty members as well as the different students within the group seemed to be positive. I think the idea of the Skills Fair and moving through each station and knowing that there weren't too many people in the group helped too. For instance, if there were just six or seven of us, I believe, or eight, at most – this left a lot of room for group collaboration. So, you sat there and you thought about the skills and faculty prompts and you talked it out through each other, and then you also had the faculty helping you out, if they needed too. So I think the overall positive learning environment impacted learning in a good way, regardless of internal factors - if they wanted to be there or not, either way – I think the group collaboration helped the students critically think. Because now it's like, "Wait, who remembers what the systolic blood

pressure needs to be?” It was literally a group collaboration of remembering, “Well, didn’t we read in that textbook this and this?” Or, “Weren’t we taught this?” So it’s now more of actually getting the group to discuss and learn from each other.

Finally, for some participants, receiving prompts from faculty and preceptors prevented them from overlooking errors. Those participants considered avoiding errors as CT. Participant 6 shared:

Okay, when [instructor name] was demonstrating the Chevron technique right after we inserted the IV catheter and we were trying to secure the catheter, put on the extension set, and flush the line at what seemed to be all at the same time. I forgot about how you don’t want to put the tape right over the hub of the catheter because when you go back in and try to assess the IV site - you’re trying to assess whether or not it is patent or infiltrated - you have to visualize the insertion site. That was one of the things that I had been doing wrong because I was just so excited that I got the IV in the vein in the first place - that I didn’t think much about the tape or the tegaderm for sterility. So I think an important part of critical thinking is to be able to recognize when you’ve made a mistake and stop, stop yourself from doing it in the future.

Participant 6 added:

I was a lot more nervous in the emergency department (ED) during my preceptorship than I would’ve been on a med-surg floor with a faculty member. In the ED, we get patients who have urgent needs and are in emergent situations. I was a lot more cautious when it came to thinking of things on my own - I was

looking or hoping for someone to tell me what to do and I needed prompting in order to think on my own - to think critically. Even with things that I probably should've done or knew, but it is just that I knew I had someone there that would tell me what to do. So that is how I needed prompting. During the Skills Fair, I needed prompting too because sometimes the faculty asked questions and I wouldn't know the answer - so I guess that was them prompting me to think on my own.

Table 4 *Factors Impacting Critical Thinking Skill Development During Skills Fair Intervention*

Themes	Sub-Themes	Frequency of Mentions
Internal Factors		33
	Confidence and Anxiety Levels	17
	Attitude	10
	Age	6
External Factors		62
	Experience and Practice	21
	Faculty Involvement	24
	Positive Learning Environment	11
	Faculty Prompts	6

Skills Fair Intervention as a Critical Thinking Skill Developmental Strategy

Overall, the participants perceived the Skills Fair intervention as a refresher of nursing knowledge and skills that promoted confidence, particularly after a long break from school. The majority of participants regarded the intervention as a relaxed, non-threatening learning opportunity, especially for those participants who had more experience in the clinical setting. After the Skills Fair, the participants' perception of CT did not dramatically change. However, the participants perceived CT was reinforced during the Skills Fair with the application of skills and knowledge, noticing trends to prevent patient complications, considering future outcomes, and analyzing relevant versus irrelevant data. The participants identified the Skills Fair intervention was effective as a CT skills developmental strategy, as revealed in two themes: (1) develops alternative thinking and (2) thinking before doing. The identified themes addressed the third research question.

Develops Alternative Thinking. The participants perceived the Skills Fair intervention helped enhance CT and confidence by developing alternative thinking due to a more profound connection between knowledge and skills. The participants stated the learning of rationale for certain procedures provided during the Skills Fair helped reinforce this connection. The participants also shared they developed alternative thinking after participating in the Skills Fair by noticing trends in data to prevent potential complications from faculty prompts. Participant 3 believed the Skills Fair was a mixture of increasing experience, confidence, and evidence-based practice. She considered those to be factors as promoting CT through the application of knowledge and skills. Participant 3 shared:

I do think the Skills Fair helped me realize that critical thinking was not as abstract and hard as I initially thought. Critical thinking during the Skills Fair was as simple as noticing data trending down for a patient during the vital sign station, why you tape an IV a certain way so it remains sterile yet still able to assess it later, why the vastus lateralis is a safe site for an IM injection, or why you have a patient tilt their head forward or back at different points of inserting an NG tube. Questions like those from faculty promoted critical thinking - by having a group discussion and understanding the rationale, it doesn't have to be so complex. It could just be as simple as those examples - reinforcing the evidence and knowledge so I can apply them in practice.

Critical thinking was described as not just knowing what to do, but also knowing how and why things were done. The participants believed understanding the rationale of each skill during the Skills Fair intervention helped them understand how to apply knowledge in nursing practice. Participants perceived Participant 10 shared:

I'll admit, before nursing school, I was more of a logical "black and white" thinker - like you solve a problem and then that was it, you didn't have to think more in-depth about it. During the Skills Fair and in nursing school, more in-depth thinking is required. I have developed a different way of thinking throughout this process. I now understand how and why interventions are needed. You must think through an entire scenario because patients don't usually have only one problem and you have to think about all the things that could be happening to prevent complications. You have to understand rationale in order to make good decisions about interventions. Nursing school has really helped with

critical thinking. The Skills Fair enhanced my thinking and was a good refresher before going back to the hospital. Each semester, I feel like my thinking has gotten better and better, because you're thinking more critically, 'cause school and patients are more challenging each semester.

Participant 6 shared an experience in the clinical setting related to her perceptions of the importance to make connections between knowledge and the application of skills in practice. After participating in the Skills Fair, the student was caring for a premature infant who was having respiratory problems. The participant was supervised by a preceptor, but the preceptor was attending to another important matter when the infant stopped breathing. The participant said she remembered from an earlier intervention in the trauma ward that stimulating a baby through touch helped facilitate breathing, so she tickled the infant's foot, and the baby started breathing again. Participant 6 stated:

Yes, that was all that the infant needed - so once the infant was breathing again I immediately went and called my preceptor back in the room. I told her about the situation - so we paged the doctor and he came in. Situations like that - are what make me value critical thinking... because it's like - What if I hadn't been in there? What if I wouldn't have been able to think on my feet? What if I didn't know what to do? Those are the important parts of being a nurse. Being able to recognize what's going on around you and figuring out how to apply these bits and pieces of information together, making those connections between knowledge and skills. It is easy to learn facts about diseases, facts about interventions, but when you understand rationale - you are able to act accordingly when something unexpected happens and think outside the box. Examples like

this is what makes me value critical thinking and the Skills Fair reinforced this type of thinking.

Participant 1 claimed during the Skills Fair intervention, her instructor emphasized CT through thinking of alternative scenarios. The participant stated the faculty prompted her alternative thinking through questioning about noticing trends to prevent potential complications. Participant 1 shared:

Another way critical thinking occurred during the Skills Fair was when [instructor name] was teaching and prompted us about what it would be like to care for a patient with a fractured hip - I think this was at the 10-minute focused assessment station, but I could be wrong. I remember her asking, “What do you need to be on the look-out for? What can go wrong?” I automatically did not think critically very well and was only thinking circulation in the leg, dah, dah, dah. But she was prompting us to think about mobility alterations and its effect on perfusion and oxygenation. She was trying to help us build those connections. And I think that’s a lot of the aspects of critical thinking that gets overlooked with the nursing student - trouble making connections between our knowledge and applying it in practice.

The participants perceived understanding the evidence of procedures and applying it to practice led to alternative thinking by noticing trends to prevent potential problems. Alternative thinking involved quickly thinking in a possible scenario to prevent errors and ensure the safety of patients. To reiterate the point of the participants’ statements, the statement of Participant 11 may be used as a summary. Participant 11 stated:

In nursing, anything can happen at any given moment. You need to be able to approach and assess a situation. You need to be able to think of different ways of thinking to put all of the information together, process it, and create a plan - an effective plan. That planning forces you to apply knowledge and skills to prevent patient problems. That takes good critical thinking. Really good nurses are the ones who have the ability to CT.

Thinking Before Doing. In nursing school, the participants revealed several of the things the students learned were often book-based and memorized, especially the skills. The participants appreciated the Skills Fair intervention for providing the students a hands-on situational learning experience which allowed them to think at a higher level. The participants described CT was promoted during the Skills Fair by considering future outcomes and analyzing relevant versus irrelevant patient data before taking action. Participant 9 shared she was able to CT by considering different outcomes during the Skills Fair before taking action. Participant 9 said:

I think what helped me the most is considering outcomes of my actions before I do anything. For instance, if you're thinking, "Okay. Well, I need to check their blood pressure before I administer this blood pressure medication - or the blood pressure could potentially bottom out." I really don't want my patient to bottom out and get hypotensive because I administered a medication that was ordered, but not safe to give. I could prevent problems from happening if I know what to be on alert for and act accordingly. So ultimately knowing that in the clinical setting, I can prevent complications from happening and I save myself, my license, and promote patient safety. I think knowing that I've seen the importance of critical

thinking already in practice has helped me value and understand why I should be critically thinking. Yes, we use the 5-rights of medication safety - but we also have to think. For instance, if I am going to administer insulin - what do I need to know or do to give this safely? What is the current blood sugar? Has the patient been eating? When is the next meal scheduled? Is the patient NPO for a procedure? Those are examples of questions to consider and the level of thinking that needs to take place prior to taking actions in the clinical setting.

Participant 2 shared:

Well, critical thinking was promoted, because at each station, the teachers were asking questions, like now, why is this important? Why do you do that? How does that actually affect your decision making in the real clinical setting? So that's how critical thinking was promoted during the Skills Fair. It made me actually think at a higher level and consider the evidence prior to taking action, as opposed to just going through the steps of each skill. The NG tube station was a good example. Like, after [instructor name] demonstrated the skill and we practiced placing the tube, she asked us about suction and what the nurse would expect to be ordered based on different patient conditions. I could not remember the rationale for why most orders are for intermittent suctioning when she asked us. She told us that continuous suctioning could damage the lining of the stomach and that was something that made sense, but I had never thought about the 'why.' I thought that was a really important learning moment for me, 'cause I didn't really know why that is typically ordered, but now I will never forget it. I realized how

important it is to understand the rationale of our interventions and think about possible outcomes before we take action or we can really hurt someone.

Participant 3 claimed that CT was promoted during the Skills Fair by allowing her to “think critically instead of thinking task-oriented before doing the skills.” Participants 7, 8, and 9 said knowing evidence-based practice and the rationale for what they were practicing helped them consider alternative outcomes prior to taking action. In addition, they were able to analyze between relevant and irrelevant data which they considered a component of CT. Participant 4 believed CT in nursing and understanding relevant data was a matter of life and death. Participant 4 stated:

In the nursing profession, correct critical thinking or understanding of a situation - to dissect it accurately - can be a life or death decision based on your ability to critically think. So if you're not focused, if you don't know what to look for, if you don't know what's relevant or current, or if you don't know what to do - then you can potentially kill someone, so critical thinking is very relevant to teach and learn. So the Skills Fair helped me by being able to practice the skills after I watched faculty do them as they discussed the evidence behind the skill. This helped me realize the importance of the “why's” before doing something.

The participants perceived CT was promoted during the Skills Fair by learning to be vigilant of their surroundings and of patient assessment findings. Particularly, the participants believed piecing information together by evaluating relevant patient data and noticing symptoms manifested by patients allowed them to provide safe care. Participant 2 shared:

I cared for a patient that I talked about earlier with sudden onset of confusion and liver disease. I thought to check the urinalysis and ammonia level right away because of a previous experience in clinical. As it turned out, the ammonia level was very high. This made me think of the importance of evaluating patient data thoroughly - because if we didn't catch that, if it went unnoticed, the patient could quickly deteriorate. Instead, we brought it to the provider's attention and the patient was treated appropriately. These experiences made me value the importance of critical thinking by doing a good assessment and evaluating relevant patient data prior to taking action.

Table 5 *Skills Fair Intervention as a Critical Thinking Skill Developmental Strategy*

Themes	Sub-Themes	Frequency of Mentions
Develops Alternative Thinking		13
	Application of Knowledge and Skills	9
	Noticing Trends to Prevent Complications	4
Thinking Before Doing		10
	Considering Future Outcomes	5
	Analyzing Relevant Data	5

Evaluation of Findings

The participants perceived the Skills Fair promoted confidence by practicing previously learned material and reinforcing their thinking with rationale. The participants

perceived “confidence” and “experience” contributed to CT skills during the Skills Fair. The intervention was also viewed as a positive, non-threatening active learning strategy due to the festive atmosphere and not being graded. The participants voiced the Skills Fair, in the future, should be more challenging and model “real-life” nursing in order to better promote CT skills. The findings revealed the Skills Fair intervention was perceived as a positive refresher after a long break from nursing school (e.g., summer break) that reinforced CT skills.

Although certain factors impacting the development of CT skills during the Skills Fair intervention were identified in the findings, the impact appeared to be from a combination of internal and external factors rather than just one specific factor. The factors appeared to be interrelated. For instance, age was associated with confidence and anxiety levels, and in turn with performance and CT skills. Older students were perceived to have more confidence and less anxiety which made them appear to have better performance and CT skills. The students’ attitude and faculty involvement also appeared to be related with the learning environment. The findings displayed an involved instructor tended to result in positive attitudes, and positive attitudes generally resulted in a positive learning environment.

The findings also revealed the Skills Fair intervention was perceived as an effective strategy for the development of CT skills. The Skills Fair intervention was perceived to promote confidence and reinforce CT by developing alternative thinking and thinking before doing. The participants’ voiced alternative thinking occurred during the Skills Fair by learning the evidence behind nursing skills, as they developed better understanding of rationale. This allowed the participants to make deeper connections and

apply their knowledge to skills. The participants also voiced alternative thinking occurred due to faculty prompts that allowed students to notice trends in data to prevent potential complications. During the Skills Fair intervention, alternative thinking developed CT by students gaining a deeper connection between knowledge and skills and noticing trends to prevent complications and potential errors.

The participants' perceived thinking before doing occurred during the Skills Fair by questioning oneself and considering future outcomes of interventions prior to taking action. In addition, the participants' voiced thinking before doing occurred by noticing assessment data and analyzing relevant from irrelevant patient data before taking action. The thinking before doing developed CT by questioning oneself and considering diverse outcomes while noticing patient assessment data and piecing relevant information together prior to planning safe patient care.

Summary

This chapter presents the results of the study in accordance with the purpose of the study and the research questions. The purpose of this case study was to investigate the effects of an innovative Skills Fair intervention on senior baccalaureate nursing students' achievement and their perceptions of CT skills development. The research questions that guided the study were:

1. What is the difference in achievement on the Kaplan Critical Thinking Integrated Test among senior baccalaureate nursing students who participated in the Skills Fair intervention and students who did not participate?
2. What are the senior baccalaureate nursing student's perceptions of internal and external factors impacting the development of critical thinking skills during the Skills Fair intervention?

3. What are the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a critical thinking developmental strategy?

To address the first research question, the results of the independent means *t* test showed there was no difference between the means in post-test scores on the KCTIT for senior baccalaureate nursing students who participated in the Skills Fair intervention in comparison to senior nursing students who did not participate.

The qualitative data were collected through open-ended one-on-one interviews from 11 senior baccalaureate nursing students. The data were analyzed through inductive content analysis starting with close reading of the transcripts and writing memos for initial coding, followed by analysis of patterns and relationships among the data for focused coding. Themes were generated from the data analysis to address the research questions.

To address the second research question, the factors impacting CT development during Skills Fair intervention were divided into internal factors and external factors. The internal factors were characteristics innate to the students. The identified internal factors were confidence and anxiety levels, attitude, and age. The external factors were the outside influences that affected the students. The external factors were experience and practice, faculty involvement, positive learning environment, and faculty prompts.

To address the third research question, the Skills Fair intervention was considered as a strategy to develop CT through the development of alternative thinking and thinking before doing. Alternative thinking involved making better connections through the learning of rationale between knowledge and skills and then applying that knowledge to prevent complications and errors to ensure the safety of patients. Thinking before doing

included thinking of how and why certain procedures were necessary through self-examination prior to taking action. The hands-on situational learning allowed the participants in the Skills Fair to better notice assessment data and think at a higher level as their previous learning of the skills was perceived as memorization of steps. This higher level of learning allowed participants to consider different future outcomes and analyze pertinent data before taking action.

After the presentation of results, a brief evaluation of findings is provided in the previous section. In the evaluation, the findings revealed no single factor affected the development of CT during the Skills Fair intervention. A combination of internal and external factors resulted in the development of CT during Skills Fair intervention. However, the Skills Fair intervention appeared to be an effective strategy for developing CT skills. The discussion of the findings is further expanded in Chapter 5.

Chapter V

DISCUSSION

Introduction

One of the major concerns in the nursing profession is the lack of CT among student nurses and new graduates in clinical practice who directly impact patient care and safety. Critical thinking is considered an essential competency of nursing education and practice, but the continued lack of CT is directly related to cases of poor patient outcomes (Oermann et al., 2010). Reports have identified a high percentage of novice nurses commit medication errors related to a lack of CT (Ebright et al., 2004; Saintsing et al., 2011). Although CT is an outcome criterion for the accreditation of baccalaureate nursing programs, most efforts to incorporate CT into curricula are substandard (McMullen & McMullen, 2009). This noted lack of CT in the novice nurse has contributed to a significant gap between education and practice which directly influence patient safety (Benner et al., 2010; Newton & Moore, 2013).

The lack of CT and gap between nursing education and practice places the novice nurse at a distinct disadvantage when entering the nursing workforce (Benner et al., 2010; Falk et al., 2016). The education-practice gap refers to the gap between the theory of nursing education and information taught in textbooks with ideal patient scenarios, versus the complex patients seen in nursing practice today (Saifan et al., 2015). Due to the challenges of health care today, it is important that nurse educators address and improve the process of preparing students to think critically (Goodare, 2015). Developing and

promoting CT skills among nursing students will allow students to quickly identify a problem, determine the best solution, and choose the most optimal and efficient method to address a problem (Heaslip, 2008). Critical thinking skills allow students to confidently assess situations through analysis, interpretation, explanation, inference, and evaluation (Facione, 1990) while making clear and rational decisions (Thayer-Bacon, 1993). The literature is consistent in reporting outcomes that patient care improves when nurses use evidence-based practice and think critically (Ritchie & Smith, 2015).

To address the education-practice gap and improve CT skills in novice nurses, Benner et al. (2010) called for a transformation in nursing education to meet the current demands of professional practice. The demand for transformation in nursing education must be met by innovative teaching strategies that promote CT in students to minimize the education- practice gap (Benner et al., 2010). This transformation requires innovative, formidable learning experiences that integrate theory with clinical experiences to close the education-practice gap (Tanner, 2010). The Robert Wood Johnson Foundation (2012) stated the future of nursing education will be extremely interactive with engaged students who no longer receive the content delivered passively.

Although many nursing programs are implementing innovative, active teaching strategies, the literature to support their use is in short supply (Waltz et al., 2014). Further research is needed to evaluate how active learning strategies foster the development of CT in nursing students. Active learning strategies that promote CT and evidence-based practice are cited in the literature as solutions to the education-practice gap (Kalb et al., 2015). A Skills Fair intervention is cited as an effective intervention in nursing education that promotes CT, evidence-based practice, and active learning

strategies to better prepare students for practice to mitigate the education-practice gap (McClausand & Meyers, 2013; Roberts et al., 2009). An active, innovative Skills Fair intervention grounded in Constructivist Learning Theory was created at the School of Nursing where I am employed. The Skills Fair intervention incorporated evidence-based practice, CT prompts, Socratic questioning, group work, guided discussions, expert demonstration followed by guided practice, and blended learning in an attempt to promote and develop CT in nursing students (Hsu & Hsieh, 2013; Roberts et al., 2009). The re-acquaintance of psychomotor skills grounded in evidence-based practice with CT prompts was discussed as the primary objective to facilitate the development of CT in nursing students during the Skills Fair.

The purpose of this case study was to investigate the effects of an innovative Skills Fair intervention on senior baccalaureate nursing students' achievement and their perceptions of CT skills development. The explanatory sequential design was used to identify what degree the Skills Fair intervention had on senior baccalaureate nursing students' CT achievement using the KCTIT, followed-up with 11 interview sessions to explore the results further. Together, the use of quantitative and qualitative data helped answer the following research questions:

1. What is the difference in achievement on the Kaplan Critical Thinking Integrated Test among senior baccalaureate nursing students who participated in the Skills Fair intervention and students who did not participate?
2. What are the senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of critical thinking skills during the Skills Fair intervention?

3. What are the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a critical thinking developmental strategy?

The theoretical basis for the study was Constructivist Learning Theory which is an active learning approach where students explore old and new ideas through collaborative discourse and reflection to construct new meaning (Lim et al., 2015; Wittmann-Price, 2013). The target population for the quantitative data included a participant group of 30 senior baccalaureate nursing students who attended the Skills Fair intervention twice, in comparison to 22 senior students who did not participate in the Skills Fair intervention. The target population for the qualitative portion included 11 senior baccalaureate nursing students who participated in the Skills Fair intervention twice in a nursing program located in the southeastern part of the U.S. The participants were between 21-30 years old, both male and female, and from diverse cultural and educational backgrounds. The summary, interpretation, and implication of the findings related to the literature and conceptual framework are contained in Chapter 5. Finally, recommendations for future research and the conclusion of findings are included in Chapter 5.

Summary of the Findings

Results for the quantitative portion showed there was no difference between the means in post-test scores on the KCTIT for senior nursing students who participated in the Skills Fair intervention in comparison to senior nursing students who did not participate. An independent means *t* test was completed to determine if there was a significant difference in the KCTIT post-tests between those who participated in the Skills Fair intervention and those who did not participate. The achievement scores of the two groups based on descriptive statistics showed the scores were almost equal.

Independent means *t*-test results showed the results of the study were not significant given the *p*-value ($p = 0.86$) is greater than the level of significance ($p = 0.05$).

The qualitative portion of the study focused on interviewing 11 senior baccalaureate nursing students who participated in the Skills Fair intervention twice. Participants' age ranged from 21-30 years old where everyone was female except for one. Seven of 11 participants were White, three were Black, and one was Indian American. The participants perceived their CT was enhanced and reinforced by the Skills Fair intervention because it promoted confidence in students' knowledge and application of skills. The participants of the study perceived the Skills Fair intervention as a refresher of nursing knowledge and skills especially after a long hiatus from school. The Skills Fair was perceived as being a positive, active learning strategy that was non-threatening to the students. The internal factors that had the most impact on senior baccalaureate nursing students' CT skills development during the Skills Fair intervention included confidence and anxiety levels, attitude, and age. The external factors identified from the responses of the participants included experience and practice, faculty involvement, positive learning environment, and faculty prompts. They also indicated the Skills Fair intervention was an effective CT skills developmental strategy with two prevailing themes: (1) develops alternative thinking, and (2) thinking before doing.

Interpretation of the Findings

Research Question 1. What is the difference in achievement on the Kaplan Critical Thinking Integrated Test among senior baccalaureate nursing students who participated in the Skills Fair intervention and students who did not participate?

Results conclude there was no significant difference in achievement on the KCTIT post-test for senior nursing students who participated in the Skills Fair

intervention in comparison to senior nursing students who did not participate. No literature is available that directly supports or counters this finding. However, students did perceive more confidence and experience after participating in the Skills Fair intervention. In addition, students perceived the Skills Fair intervention as a reinforcement of their CT skills.

The lack of a significant finding of achievement on the KCTIT post-test for students who participated in the Skills Fair could be for a variety of reasons. First, the Skills Fair intervention was a 1-day learning event which made it challenging to dramatically alter students' CT skills. Therefore, the length of time or frequency of occurrence for the Skills Fair intervention should be reconsidered to evaluate whether CT skills will improve. Second, several of the participants in the study voiced concerns during the interview that the KCTIT may not be a true reflection of their CT achievement. The participants believed this because the KCTIT was not counted for a grade and students believed many "did not try very hard to score well." Therefore, nursing educators should consider placing more importance on CT achievement tests with student incentives or using a different method to evaluate the development of CT skills. Finally, many studies have explained the need for CT skills development and adapting an approach that evaluates the development of CT skills in nursing education (Jenkins, 2011; Nair & Stamler, 2013; Swing, 2014). It is evident from the literature that nursing educators need to be more specific about the process of developing and evaluating CT (Hobus, 2008).

Despite the quantitative data result, the Skills Fair was perceived as a confidence booster and refresher of CT skills that were reinforced by the active learning strategies of

the intervention. The Skills Fair intervention enhanced the development of self-confidence and CT by participants practicing previously learned skills in a controlled, safe environment. The non-threatening environment of the Skills Fair intervention allowed students to learn without fear and they believed their CT was strengthened after participating.

Research Question 2. What are the senior baccalaureate nursing students' perceptions of internal and external factors impacting the development of critical thinking skills during the Skills Fair intervention?

From the results, there are three internal factors that have the most impact on senior baccalaureate nursing students' critical thinking skills – confidence and anxiety levels, attitude, and age. One participant explained her level of confidence kept her calm and permitted her to perform better during the assessment station; while anxiety prevented her from thinking clearly and remembering what to do at another station of the Skills Fair. Higher confidence levels were associated with lower anxiety levels. The attitude of a participant was also considered an important factor in the development of CT skills during the Skills Fair. Participants believed possessing a pleasant and positive attitude meant a student was eager to learn, participate, accept responsibility of completing duties, and think seriously.

Another important contributing internal factor highlighted was age. Participants stated being older than traditional college students allowed them to think critically and problem-solve more easily throughout the course of their education, but especially during the Skills Fair. The participants believed older students have more awareness and life experiences that led to better performance during the Skills Fair and in other situations.

Some participants also identified being older meant having more confidence which contributed to lower anxiety levels. However, a few select participants did not believe age was a contributing factor in the development of CT skills during the Skills Fair intervention. A participant further explained she had friends who attended the Skills Fair ranging from young to old, and there was no evident difference in their CT skills or performance.

External factors impacting CT development were also identified which included experience and practice, faculty involvement, positive learning environment, and prompts. Participants stated the experiences they have in the clinical setting helped them think critically during the Skills Fair. Participants were able to remember scenarios from their experiences and remembered what they needed to do and what not to do in certain situations. Several of the participants have also linked experience and practice with higher confidence allowing CT during the Skills Fair. Faculty involvement was also indicated by participants as an important factor. Most of the students said a familiar instructor facilitated better CT than an unfamiliar instructor. The faculty members who provided immediate feedback were also perceived by students as a form of CT promotion. The participants reported a positive learning environment also contributed to CT development.

Findings of the study regarding the internal factors that impact CT skills of students are consistent with the findings of Hedin (2010) and Killam et al. (2011). Hedin (2010) reported reflection and life experiences affect learning. Contributing factors that hinder or enhance CT skills include motivation, attitude, faculty commitment, age, communication skills, confidence, and anxiety (Duscher, 2009; Hedin, 2010; Killam et

al., 2011). Factors such as motivation, attitude, anxiety, age, confidence, and the commitment of faculty and students were identified as factors that are important, but often overlooked in the teaching-learning process (Swing, 2014).

A study by Campbell-Williams (2011) noted the majority of nursing skills are taught in the classroom with very few opportunities for hands-on practice. Health care provider's confidence diminishes when there is a lack of opportunities to practice skills. The lack of confidence may result in poor performance of the skill, medical errors, or adverse patient outcomes. Early evaluation of CT skills throughout the nursing program can increase confidence and help the nursing student to make better decisions in the clinical setting for safer patient care (Duchscher, 2009; Killam et al., 2011; Swing, 2014).

Roberts et al. (2009) indicated the approach of a Skills Fair intervention to develop CT skills promoted a consistent teaching approach of psychomotor skills to the novice nurse that decreased anxiety and gave clarity of expectations to the students in the clinical setting. Anxiety was identified above as one of the major internal factors that impact the development of CT skills. The participants believed anxiety can drastically alter and influence the decision making of the student nurse when faced with situations that require CT. Findings of Swing (2014) were consistent with the results of my study given the researcher reported student age and previous experience can influence CT skills positively or negatively depending on the individual's ability to reflect on an experience. Another study (Shinnick & Woo, 2013) found age positively predicted total CT skills scores. However, one study (Chau et al., 2001) had a different result. Chau et al. (2001) used the California Critical Thinking Skills Test and the results showed there was no

significant correlation between age, gender, and work experience to develop CT skills among nursing students.

Other researchers also support the findings of the external factors that impact CT skills development. Ogundokum (2011) had the same findings on having a positive learning environment. Ogundokum (2011) explained in his study educators who are able to maintain control of the classroom and create a positive academic environment have been linked to enhanced CT skills among students. The learning of the environment for students contributes to the learning and development of CT skills. Killam et al. (2011) explained the involvement of nurse educators in the teaching-learning process is essential in shaping the learning experiences and development of CT in students. Student participants reported learning is improved when educators are knowledgeable, approachable, and respectful (Hanson & Stenvig, 2008).

Roberts et al. (2009) highlighted the need for positive faculty-student interactions during the Skills Fair intervention. Results from the study of Roberts et al. (2009) showed the positive faculty-student interactions contributed to the successful learning of students as they mature, advance, and develop CT. The approach used in the Skills Fair intervention which presented evidenced-based practice for each skill promoted students' CT by helping them better understand rationale. Providing the rationale for each skill helped students understand not only the correct technique, but also the complex decision making needed in practice during various patient scenarios (Roberts et al., 2009). While practicing psychomotor skills repetitively builds competence, CT can only be developed by focusing on decision-making and the evidence behind the psychomotor skills (Oermann et al., 2011). Confidence was also an important factor highlighted in the

results of this study. The Skills Fair intervention was perceived as a confidence booster for the participants. Increased confidence in the nursing student allows them to make better decisions in the clinical setting which improves patient care and safety (Duchscher, 2009; Killam et al., 2011). Roberts et al. (2009) had similar findings where factors, such as faculty praise and encouragement, promoted student confidence and engagement.

Research Question 3. What are the senior baccalaureate nursing students' perceptions of the Skills Fair intervention as a critical thinking developmental strategy?

The participants perceived the Skills Fair intervention as a refresher of nursing knowledge and skills that promoted confidence. Most participants viewed the intervention as a relaxed, positive learning environment in comparison to the clinical setting. However, participants explained the Skills Fair was an effective intervention and developmental strategy to promote CT skills. The findings of the study show a combination of interrelated internal and external factors impacted the development of CT during the Skills Fair. The perceptions of participants were that the Skills Fair intervention developed alternative thinking and thinking before doing.

The participants believed alternative thinking occurred because the evidence and CT prompts for each station were included in the rubrics which helped them understand rationale and apply that knowledge to their skills. Challenging the students with Socratic questioning during the Skills Fair allowed faculty to distinguish between what students knew based on evidence versus what they believed to be true. Alternative thinking was also described as quickly thinking of alternative solutions to problems based on the latest evidence and using that information to determine what actions were warranted to prevent complications and prevent injury. This practice allowed the participants to implement

appropriate interventions and apply their knowledge during the various stations and challenges of the Skills Fair. This finding is supported by Papathanasiou, Kleisiaris, Fradelos, Kakou and Kourkouta (2014) as they reported an important stage of CT is for the nurse to assess the reliability of information and confirm accuracy of evidence to prevent complications. Nurses play a vital role in promoting patient safety and must demonstrate CT through the recognition of the signs of clinical deterioration and take action promptly to prevent complications (Garvey, 2015).

Another perception voiced by the participants was thinking before doing. The participants perceived they were better able to think before doing during the Skills Fair intervention through self-examination and considering potential outcomes of interventions. Participants stated the majority of the information they learned in nursing school was book-based and memorized. However, the Skills Fair intervention provided students with a hands-on situational learning that allowed students to divert from routine, consider future outcomes, and notice and analyze relevant data to help them think before taking action. This finding is consistent with Papathanasiou et al. (2014) description of CT as “the mental process of active and skillful perception, analysis, synthesis, and evaluation of collected information through observation, experience and communication that leads to a decision for action” (p. 283). Thinking before doing is considered a CT skill as the nurse must analyze data and consider all possible solutions before deciding on the most appropriate action for each patient (Papathanasiou et al., 2014).

Findings in this study regarding the Skills Fair intervention as a CT development strategy are supported by several other studies which highlighted the need and the importance of a Skills Fair intervention and similar approaches in developing CT skills.

Due to the call for transformation in nursing education, several states have implemented initiatives to address the lack of CT skills, but many nursing schools around the country continue to lack innovation (Benner, 2012; Spector & Odom, 2012). The Skills Fair intervention is an active learning strategy incorporating evidence-based practice, CT prompts, Socratic questioning, group work, guided discussions, expert demonstration followed by guided practice, and blended learning in an attempt to promote and develop CT in nursing students (Hsu & Hsieh, 2013; Roberts et al., 2009). Kalb et al. (2015) reported active learning strategies that promote CT and evidence-based practice are key to CT promotion and solving the education-practice gap. Nelson (2006) asserted students who are actively involved in their learning through activities like those implemented during the Skills Fair, are more likely to develop CT. The use of active learning strategies, like the Skills Fair, throughout the curriculum are the best strategies to promote CT and evidence-based practice - as it is integrated into multiple areas of the curriculum and not just one research course (Nadelson & Nadelson, 2014). These findings are consistent with the perception of participants in the study who were able to think of alternate situations and think before doing throughout the eight stations of the Skills Fair intervention. Ohman (2010) had a similar view on the Skills Fair intervention as a positive teaching strategy that contributed to improved knowledge and CT as the intervention supported multiple learning styles.

Other studies (McCausland & Meyers, 2013; Roberts et al., 2009) evaluated their students who participated in a Skills Fair intervention. The students who participated cited the Skills Fair as a positive learning experience. The evaluation and comparison of the pre-and post-test quiz indicated student improvement (McCausland & Meyers, 2013).

Roberts et al. (2009) described the necessity for this type of active learning strategy for students who have taken a break from nursing all summer. Based on research findings, psychomotor skills decline over time even among licensed experienced professionals within as little as 2 weeks and may need to be relearned within 2 months without performing a skill (Roberts et al., 2009). When applying this concept to student nurses for whom each skill is new, it is no wonder their competency result is diminished after having a summer break from nursing school. This is consistent with the results of the study where students highlighted the Skills Fair intervention served as a refresher after a long break from school and strengthened their CT skills.

Roberts et al. (2009) also explained the Skills Fair intervention allows students to perform and practice skills after expert faculty demonstration. This provides a non-threatening learning environment where students learn most efficiently since educators make the experience interactive and meaningful to the student. According to Knowles (1980), the adult learner prefers interaction, prefers to be in control of their learning experience, and needs the learning experience to be meaningful (Wittmann-Price, 2013). These findings are consistent with the results from this study where participants found the Skills Fair intervention to be a calm environment, but also allowed the students to learn with hands-on situational learning helping them learn at a higher level. Both of these findings are evident in the studies previously conducted on Skills Fair interventions.

Implications of the Findings

The results of the study may have implications on different stakeholders. I investigated CT achievement using the KCTIT, internal and external factors impacting the development of CT throughout the Skills Fair, and explored student perceptions of the Skills Fair intervention as a CT developmental strategy. The findings of the study

reinforced the results of existing literature. This case study addressed the call for nursing education to transform teaching practices by implementing active learning strategies like the Skills Fair intervention, and then evaluating the effects of those strategies on student CT skills development. The main implication of the findings is the participants perceived the Skills Fair intervention as a CT developmental strategy. This information is useful for nurse educators who plan their own active learning activities to promote evidence-based practice and CT to mitigate the education-practice gap and improve patient outcomes.

At an organizational level, the results provide schools and educators information that is helpful in reviewing their current approach in educating nursing students. As evidenced in the results, the importance of developing CT skills is crucial to becoming a safe, professional nurse. The study has identified internal and external factors that should be considered when addressing the promotion and development of CT. Furthermore, the results of the study have strengthened the importance of active learning strategies like the Skills Fair intervention in developing CT skills among nursing students. The findings may be used by schools and educators to promote the development of CT. Changes in teaching practices in nursing education are warranted (Benner et al., 2010; Goodare, 2015) and may be implemented by school administrators or teachers to improve the development of CT skills. This study has identified the influence of a short-term learning event like the Skills Fair intervention on developing CT in nursing students. Therefore, other implications for nurse educators include creating longer-term interventions and investigating their impact on developing CT throughout the nursing program.

Other nursing programs that have not implemented a Skills Fair intervention or a similar strategy may revisit and consider adapting a similar intervention to address the need to better develop CT among nursing students. The information provided in this case study may be used by other nursing programs as a foundation in planning a Skills Fair intervention that promotes CT and evidence-based practice; including important factors to consider. The perceptions of participants in the Skills Fair, and the various factors that need to be addressed to promote the development of CT are provided and explained in this study.

At an individual level, the findings of the study will be useful to nursing students to better understand and identify how the factors impacting the development of CT relate to their own experience. This understanding will allow nursing students to have a better grasp of what CT skills are and the best approaches to achieve and develop CT. Also, this may encourage individuals who have not yet entered nursing school to explore their options and have a better understanding of the thinking required to be a competent nurse.

Recommendations for Future Research

Future research in this area could focus on the following areas:

1. Expand the scope of this case study to include other geographic regions and a larger sample size to investigate if the results are evident in other areas. Compare and contrast different regions to explore if the results will be similar. This expansion will provide insights on whether the location was a factor in the perception of the Skills Fair intervention.
2. Expand the scope to include nurse educators to gain a more comprehensive perspective of developing CT from both educators and students who participated in the Skills Fair intervention.

3. Expand the scope by including other baccalaureate nursing programs that have similar learning strategies like the Skills Fair intervention to have a larger representation of baccalaureate nursing programs.
4. Include other factors, such as nurse educators' educational attainment (high school, bachelor's degree, master's degree, and doctorate) to further investigate if these factors impact results.
5. Based on participant perceptions, future Skills Fair interventions should be more rigorous if the goal is to develop CT. In addition, future studies should explore the link between confidence and CT in nursing students. Finally, nursing programs need to define and clearly explain the expectations of CT for the baccalaureate nursing student throughout the entire curriculum.

Summary and Conclusions

A major concern in the nursing profession is the lack of CT among student nurses and new graduates. This lack of CT impacts the decision-making of novice nurses and directly effects patient care and safety (Saintsing et al., 2011). Critical thinking is considered an essential competency of baccalaureate nursing education and practice, but there is a significant gap between education and practice (Benner et al., 2010; Fero et al., 2009). Transforming nursing education to develop CT skills in nursing students is the solution to bridging the gap between education and practice. It is vital nurse educators address and improve the process of preparing students to critically think with the complicated and the constantly evolving environment of health care today (Goodare, 2015; Newton & Moore, 2013). Active learning strategies allow students to make connections with their knowledge and apply it to clinical practice (Baker, 2011; Russell et al., 2007). The Skills Fair intervention in this study utilized the principles of active

learning strategies and evidence-based practice to promote CT using Constructivist Learning Theory.

The purpose of this mixed-methods case study was to investigate the effects of the innovative Skills Fair intervention on senior baccalaureate nursing students' achievement and their perceptions of CT skills development. The results show there is no significant difference in the achievement scores on the KCTIT post-test between students who participated in the Skills Fair intervention and those who did not. However, many of the studies available highlighted the importance of active learning strategies like the Skills Fair intervention to promote CT. Internal and external factors impacting the development of CT during the Skills Fair were identified including: confidence and anxiety levels, attitude, age, experience and practice, faculty involvement, positive learning environment, and faculty prompts. The participants perceived their CT was reinforced after the Skills Fair intervention and believed the Skills Fair intervention was an effective CT skills developmental strategy as it developed alternative thinking and thinking before doing. The recommendations for future research are to expand the topic by including other regions, larger samples, and other baccalaureate nursing programs. In addition, future research should consider other participant perceptions, such as nurse educators, to better understand the development and growth of CT skills among nursing students. Finally, based on participant perceptions, future research should include a more rigorous Skills Fair intervention to develop CT and explore the link between confidence and CT in nursing students. Finally, nursing programs need to define CT and give clear expectations of CT as students' progress throughout the baccalaureate program.

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APPENDIX A:
Skills Fair Rubric Example

<p style="text-align: center;">Initiating Intravenous Therapy Implementation</p>	<p style="text-align: center;">Rationale/Prompts</p>
<ul style="list-style-type: none"> • Introduce yourself • Hand Hygiene • Provide Privacy/Explain Procedure • Check patient identification • Assess arm placement preference 	<p>Faculty – please demonstrate skill quickly and then assist the practicing students in their respective teams for as long as time allows.</p> <p>Standard introductory phase of any assessment¹. IV lines are used for medication delivery, blood transfusions, electrolyte imbalance correction, and fluid replacement directly into the circulatory system.</p> <p>Helps prevent medication and treatment errors³. Involves pt. in own care. Provides baseline data about pts. condition^{1,3}.</p>
<p>Gather and prepare equipment</p> <ul style="list-style-type: none"> • Choose proper IV cannula depending on size of vein and medication being administered • Prepare IV start kit • Assess for allergies of skin prep solution (ie Betadine, Chloro-Prep) • Prime IV extension set 	<p>Many brands of Safety Over the needle catheters (ONC) are available. Nurses select veins based on how visible the vein is, how stable the site will be, plan of care e.g. does the area remain relatively still naturally or with a splint, and considerations for further I.V. sites as the care of the patient progresses². Provides for safety of the pt¹.</p>

<ul style="list-style-type: none"> • Identify site for IV start • Apply tourniquet • Apply clean gloves • Clean site, allow to dry 	<p>What is appropriate technique for tourniquet application?</p> <p>Apply the tourniquet snugly but not to the extent it impedes arterial blood flow. You can determine this quickly by making sure you can palpate a pulse distal to the tourniquet. Do not leave a tourniquet on for longer than 4 to 6 minutes. Following these guidelines will help prevent nerve injury⁵. Veins found on the dorsal and ventral surfaces of the upper extremities (e.g., cephalic, basilic and median veins) are preferred in adults. (NOTE: Metacarpal Veins - Geriatric patients often lack enough connective / adipose tissue and skin turgor to use this area successfully.) This ensures adequate veins that are easier to puncture with needle and are less likely to rupture². Important to select a vein large enough for catheter placement and will not interfere with pt. ADLs². Make sure the skin surface cleansing agent (alcohol/chlorhexidine) is dry prior to stick. Drawing this into the vein may stimulate the vasoconstrictive action of the tunica media layer².</p> <p>Why is it important to air dry insertion area?</p> <p>Letting a cleansing agent air-dry completely (30 seconds for chlorhexidine, 60 seconds for alcohol, 2 to 3 minutes for povidone-iodine) allows time for the agent to reduce microbial counts adequately. Do not fan or blow on the skin to expedite the drying as this can reintroduce microbes to the area⁵.</p>
<p>Insert IV</p>	<p>See Source Below for technique.</p>

<ul style="list-style-type: none"> • Insert bevel up at a 10-30 degree angle • Observe for flashback • Advance catheter while retracting needle • Occlude cannula to prevent bleeding from site • Connect extension set • Release tourniquet • Flush IV catheter 	<p>Provides for safety of the pt. and nurse^{1, 3}.</p>
<p>Secure IV site</p> <ul style="list-style-type: none"> • Apply Tegaderm • Date/time/initial/gauge site 	<p><i>Transparent, semi-permeable polyurethane dressing is used to stabilize cannula after insertion^{1, 2, 4}.</i></p>
<ul style="list-style-type: none"> • Dispose needle in sharps container 	<p>Provides for safety of the pt. and nurse^{1, 3}.</p>
<ul style="list-style-type: none"> • Removes gloves and performs hand hygiene 	<p>Complications that occur as a result of infection can be largely prevented by strict aseptic precautions and good hand-washing practice¹.</p>
<ul style="list-style-type: none"> • Assess site and document procedure in patient's chart. • Intermittent flushes should be documented on the patient MAR. 	<p>How often should nurse assess site? How long should cannula stay in? How is patency maintained?</p> <p>Tenderness, pain, redness, or burning at IV site may be an early indication of phlebitis³. It is recommended that visual examination and palpation of the vein for warmth, tenderness, erythema and a palpable cord to be done every shift to detect any infection¹. Tenderness, pain, redness, or burning at IV site may be an early indication of phlebitis³. As long as there are no signs or symptoms of infiltration or phlebitis or concerns about possible contamination, a peripheral venous catheter can remain in place in an adult for 72 to 96 hours¹. Because the names of IV solutions are often abbreviated or shortened, it is important to become familiar with the names of the different solutions. If you are uncertain about a</p>

	<p>solution, consult an intravenous therapy drug guide or a pharmacist before initiating the infusion¹. Intermittent flushes should be documented on the patient MAR if continuous IV fluids are not ordered (PSL).</p>
<ul style="list-style-type: none"> • Discontinue IV fluids • Discontinue IV cannula 	<p>Why important to document cannula status upon discontinuation?</p> <p>It is possible for an IV catheter to be damaged during insertion or removal^{1,5}. Catheter can then break off and become an embolism. Also, any signs or symptoms of infection at the catheter site at the time of removal could warrant culture of the catheter tip^{1,5}. If complications occur, call PCP.</p>
<ul style="list-style-type: none"> • Hand Hygiene • Documentation 	<p>Documentation must reflect care given and provide necessary education^{3,4}.</p>

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Sources

IV Initiating Therapy Information and Video:

APPENDIX B:
Example Critical Thinking Questions from Kaplan

1. The nurse determines that a client's tracheostomy requires suctioning. What action should the nurse take FIRST?
 - A. Elevate the head of the client's bed to 90 degrees.
 - B. Quickly insert the suction catheter.
 - C. Pre-oxygenate the client.
 - D. Put on clean gloves.

2. The nurse on the medical/surgical unit has just received report. Which client should the nurse see FIRST?
 - A. A 29-year old woman undergoing peritoneal dialysis. The outflow appears bloody.
 - B. A 35-year -old man diagnosed with acute post-infectious glomerulonephritis. The client's blood pressure is 150/90.
 - C. A 45-year-old woman diagnosed with *P. jiroveci* pneumonia. The client complains of a persistent dry cough.
 - D. A 56-year-old man diagnosed with asthma. The client is scheduled for discharge today.

3. The nurse cares for a client immediately after a cardiac catheterization using the brachial artery. It is MOST important for the nurse to take which action?
 - A. Place a warm pack on the affected foot.
 - B. Obtain vital signs every 2 hours.
 - C. Compare the quality of pulses on both legs.
 - D. Determine the presence of the radial pulse bilaterally.

4. Four clients are admitted at the same time to the medical unit. Which clients should be admitted to the only private room available?
 - A. The client diagnosed with bacterial gastroenteritis.
 - B. The client diagnosed with hepatitis A.
 - C. The client diagnosed with scabies
 - D. The client diagnosed with cirrhosis.

5. A nursing team consists of an RN, an LPN/LVN, and a nursing assistant. The nurse should assign which of the following clients to the nursing assistant?
 - A. A client diagnosed with diabetes requiring a dressing change for a stasis ulcer.
 - B. A client diagnosed with terminal cancer being transferred to hospice home care.
 - C. A client diagnosed with cancer of the bone reporting pain.
 - D. A client diagnosed with a fracture of the right leg asking to use the urinal.

6. The nurse teaches a group of mothers of toddlers how to prevent accidental poisoning. Which of the following suggestions should the nurse give regarding medications?
 - A. Lock all medications in a cabinet.
 - B. Child proof all the caps to medication bottles.
 - C. Store medications on the highest shelf in a cupboard.
 - D. Place medications in different containers.

7. A 6-year-old boy is returned to his room following a tonsillectomy. He remains sleepy from the anesthesia but is easily awakened. The nurse should place the child in which of the following positions?
 - A. Sims'
 - B. Side-lying
 - C. Supine
 - D. Prone

Answer Key with Rationale:

1. C. (prevents hypoxia associated with tracheal suctioning)
2. C. (opportunistic infection associated with AIDS; causes progressive hypoxemia and cyanosis)
3. D. (compare pain, pulse, pallor, temperature, and capillary refill time)
4. C. (contagious skin disease caused by mites; transmitted by close contact, either directly person-to-person or via contaminated personal items such as clothing, bedding; requires a private room and contact precautions)
5. D. (standard unchanging procedure)
6. A. (improper storage most common cause of poisoning; highest incidence in two-year-olds)
7. B. (most effective to facilitate drainage of secretions from the mouth and pharynx; reduces possibility of airway obstruction)

Retrieved from <http://kaplanquizzes.com/nursing/nclex-rn/review/safe-and-effective-care-environment.php>

APPENDIX C:
Institutional Review Board



**Institutional Review Board (IRB)
for the Protection of Human Research Participants**

PROTOCOL EXEMPTION REPORT

PROTOCOL NUMBER: 03424-2016

INVESTIGATOR: Heidi Gonzalez

PROJECT TITLE: *Explanatory Sequential Examination of a Skills Fair Intervention on Senior Baccalaureate Nursing Students' Critical Thinking.*

INSTITUTIONAL REVIEW BOARD DETERMINATION:

This research protocol is exempt from Institutional Review Board (IRB) oversight under Exemption Category 2. You may begin your study immediately. If the nature of the research project changes such that exemption criteria may no longer apply, please consult with the IRB Administrator (irb@valdosta.edu) before continuing your research.

ADDITIONAL COMMENTS:

- *Upon completion of your research all data must be kept securely (locked cabinet/password protected computer, etc.) for a minimum of 3 years.*
- *As part of the informed consent process, audio taped interviews must include the researcher reading the consent statement to participants.*

If this box is checked, please submit any documents you revise to the IRB Administrator at irb@valdosta.edu to ensure an updated record of your exemption.

Elizabeth W. Olphie *11/30/2016*
Elizabeth W. Olphie, IRB Administrator Date

Thank you for submitting an IRB application.
Please direct questions to irb@valdosta.edu or 229-259-5045.

Revised: 06.02.10

APPENDIX D:

Example Rubric before Skills Fair Intervention

Implementation Initiating Intravenous Therapy	Possible Points	Earned Points	Comments (*Include video time frame when making comments)
<ul style="list-style-type: none"> • Introduce yourself • Verbalize Hand Hygiene • Provide Privacy/Explain Procedure • Check patient identification • Assess arm placement preference 	5		
Gather and prepare equipment <ul style="list-style-type: none"> • Choose proper IV cannula depending on size of vein and medication being administered • Prepare IV start kit • Assess for allergies of skin prep solution (ie Betadine, Chloro-Prep) • Prime IV extension set 	8		
<ul style="list-style-type: none"> • Identify site for IV start • Apply tourniquet • Apply clean gloves • Clean site, allow to dry 	12		
Insert IV <ul style="list-style-type: none"> • Insert bevel up at a 10-30 degree angle • Observe for flashback • Advance catheter while retracting needle • Occlude cannula to prevent bleeding from site • Connect extension set • Release tourniquet • Flush IV catheter 	35		
Secure IV site <ul style="list-style-type: none"> • Apply tegaderm • Date/time/initial/gauge site 	4		
<ul style="list-style-type: none"> • Dispose needle in sharps container 	5		
Priming IV tubing <ul style="list-style-type: none"> • Choose and check IV solution using the rights of medication administration • Choose correct IV tubing • Prime IV tubing maintaining sterility of IV tubing and IV fluids 	15		

<ul style="list-style-type: none"> • Connect IV tubing in IV site, maintaining sterility • Correctly secure IV tubing 	10		
<ul style="list-style-type: none"> • Discontinue IV fluids • Discontinue IV cannula (noting intact cannula) 	6		
Total earned points	100 possible		
**DOES NOT IGNORE/EXCLUDE PT (i.e.; turn back on pt at any point during set up and procedure)	5		
**PROFESSIONALISM (Chewing gum, hair in face, etc.)	5		

Student Name: _____

Date: _____

****A score of 74 or above is required for satisfactory completion of this skill check-off****

****The instructor reserves the right to have student redo any part of the skill check-off that he/she considers a critical part of the skill check-off****

A copy should be given to the student and another to the course coordinator for student records

Instructor Signature: _____

Video time length: _____

Date Video Submitted: _____

APPENDIX E:

Skills Fair Schedule with Critical Thinking Team Names

VSU Nursing Skills Fair 2015

Station 1 Vital Signs	Station 2 10 Minute Assessment	Station 3 Skin Assess. & Restraints	Station 4 NGT	Station 5 Foley	Station 6 Injections	Station 7 IV Therapy	Station 8 Safety
A	B	C	D	E	F	G	H
H	A	B	C	D	E	F	G
G	H	A	B	C	D	E	F
F	G	H	A	B	C	D	E
E	F	G	H	A	B	C	D
D	E	F	G	H	A	B	C
C	D	E	F	G	H	A	B
B	C	D	E	F	G	H	A

Student Teams

A	Team Perseverance
B	Team Flexibility
C	Team Confidence
D	Team Creativity
E	Team Inquisitiveness
F	Team Reflection
G	Team Analyzing
H	Team Intuition

APPENDIX F:
Skills Fair Evaluation Form

We appreciate your help in evaluating this program. Please indicate your rating of the Fall 2015 Skills Fair in the categories below by circling the appropriate number, using a scale of 1 (low) through 5 (high). Please fill out both parts of this form. Thank you for your time to help faculty make students more successful.

1. To what extent do you think that this Skills Fair helped you to enhance skills acquisition?

Not at all 1 2 3 4 5 Very much

2. To what extent do you think that this Skills Fair helped you to improve communication (e.g., with faculty/providers, with patient, or documentation)?

Not at all 1 2 3 4 5 Very much

3. To what extent do you think that this Skills Fair helped you to improve student confidence/comfort level?

Not at all 1 2 3 4 5 Very much

4. To what extent do you think that this Skills Fair helped you to improve critical thinking (e.g., interpreting data, recognizing relevant from irrelevant data, providing rationale for interventions, evaluating interventions, or reflecting on experience)?

Not at all 1 2 3 4 5 Very much

5. To what extent do you think that this Skills Fair helped you by using consistent faculty teaching strategies, i.e., demonstration, cooperative learning, and guided practice?

Not at all 1 2 3 4 5 Very much

Comments/Program Improvements:

6. What will you take away with you from this Skills Fair? How will this transfer to your nursing practice? _____

7. In your opinion, what did not work during this Skills Fair? What suggestions do you have for improving it? _____

8. What was the highlight of the Skills Fair? _____

9. How do you perceive your team name affecting nursing practice? _____

10. Do you have any additional comments? _____

(Please continue on back)

APPENDIX G:
Sample Interview Questions

1. Please describe your perceptions of critical thinking?
2. What does critical thinking actually mean to you, can you define it?
3. Describe how critical thinking was promoted during the Skills Fair?
4. As a senior baccalaureate nursing student when participating in the Skills Fair, what characteristics did you see in critical thinkers?
5. Can you describe a specific situation during the Skills Fair where you utilized critical thinking?
6. As a senior nursing student, did you need prompting in your critical thinking abilities to complete competent nursing care?
7. How did you feel when you used your critical thinking skills during the Skills Fair?
8. During the Skills Fair, did you believe any internal factors, such as age, gender, confidence, level of anxiety, attitude, or motivation affected the development of CT?
9. During the Skills Fair, did you believe any external factors, such as student involvement, faculty involvement, or the amount of previous real-life nursing experiences affected the development of CT?
10. During the Skills Fair, did you note anything that impeded the development of critical thinking?
11. To what extent do you think that this Skills Fair helped you to improve critical thinking (*e.g.*, interpreting data, recognizing relevant from irrelevant data, providing rationale for interventions, evaluating interventions, or reflecting on experience)?

12. Has your perception of critical thinking changed after participating in the Skills Fair intervention?
13. Do you value critical thinking? If so, why is it important to you?
14. What helped you to value critical thinking?