# A STUDY OF THE EFFECT OF HUMAN PATIENT SIMULATION ON CRITICAL THINKING AND CONFIDENCE SKILLS OF BACCALAUREATE JUNIOR NURSING STUDENTS

A Dissertation

Submitted to the
Faculty of Argosy University/Online

In Partial Fulfillment of
The Requirements for the Degree of

Doctor of Education

by

Yanick Deltor Joseph

August 2011

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## ABSTRACT

This quantitative study sought to evaluate human patient simulation's (HPS) impact on junior student nurses' critical thinking and confidence skills. The study investigated the impact of simulation as an adjunct to clinical learning on the critical thinking and confidence skills of (N=22) junior nursing students enrolled in the third quarter of a bachelor of nursing degree program in south Florida. A constructivist viewpoint served as the theoretical framework for the study. A two groups comparison group, pretest-posttest design with the independent variable (simulation), and the dependent variables (critical thinking and self-confidence) ascribed to test the following null hypotheses set at a .05 significance level.

$H_0$1: There is no difference on baccalaureate junior nursing students' critical thinking skills after a clinical simulation experience as measured by the California Critical Thinking Skills Test (CCTST).

$H_0$2: There is no difference on baccalaureate junior nursing students' confidence levels in assessment skills after a clinical simulation experience as measured by the Confidence Scale (CS).

$H_0$3: There is no correlation between baccalaureate junior nursing students' critical thinking and confidence skills.

The study's results suggest that critical thinking skills and the self-confidence of baccalaureate junior nursing students were not influenced after a clinical simulation experience. There was a moderate correlation between critical thinking and confidence skills after simulation. The author recommends replication of the study with a larger sample of students in different and larger academic settings.

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To my students, thank you for sharing this voyage with me. You encouraged me to stay authentic and to envision the shared possibilities of expanding our horizons. You have taught me unforgettable lessons and I thank you for those.

## DEDICATION

I dedicate this research project to my mother, Anne Marie Deltor, whose love, consistent encouragement, and passion for learning have guided me throughout my life. Although you are not here to witness the completion of this goal, I know that you too are celebrating this achievement in my life's journey. I love you, Mom, and I thank you for instilling in me the gifts of due diligence, perseverance, and the love of learning.

To my husband, Marc, my children, Marc Bamuthi and Joelle, and to my grandson Mkai—you have been so patient, encouraging, and loving. I appreciate your steadfast belief in me and the personal pride you take in my accomplishments. I thank you for your love, unflinching support, and your graciousness in enduring the benign neglect of these past years. I could not have earned this degree without your love. Part of this degree belongs to you too.

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# CHAPTER ONE: THE PROBLEM AND ITS COMPONENTS

## Introduction

A rapidly changing health care system calls for a competent workforce of nurses who can think critically. As a nursing program outcome, critical thinking plays a pivotal role in the instruction of student nurses (Finkelman & Kenner, 2010). Finding innovative learning opportunities to prepare future nurses to think critically remains a challenge for nurse educators (National League for Nursing [NLN], 2003). The NLN's call for instructional reform demands effective integration of various educational components (Slavin, 2009). Simulation has emerged as a useful instructional strategy with strong pedagogical underpinnings (Campbell & Daley, 2009), and studies on simulation in nursing have received significant attention (Nehring & Lashley, 2009a). However, specific research on simulation's impact on junior students' critical thinking and confidence skills in their first year of clinical courses is limited. Therefore, this study evaluates human patient simulation's (HPS) impact on junior student nurses' critical thinking and confidence skills.

Simulation, as an instructional strategy that may impact student nurses' critical thinking and confidence skills, are introduced in the first chapter. Chapter One includes the background of the problem, purpose of the study with research questions, and hypotheses. Definitions of terms and limitations and delimitations of the research are also included in the first chapter. The setting for the investigation is at a college of nursing in south Florida. Authorized to operate by the Florida Board of Nursing, the college is also accredited by the Commission on Collegiate Nursing Education (CCNE).

## The Problem

Patient safety has become the focus of health care professionals, following reports from the Institute of Medicine (IOM, 2000, 2001, 2004). Preparing future nurses to render safe care in increasingly intricate and evolving health care systems becomes a core competency nurse educators must master (American Association of Colleges of Nursing [AACN], 2008). The National League for Nursing Accrediting Commission (NLNAC, 2008) requires student clinical experiences that reflect best practices and standardized patient health and safety goals. The Quality and Safety Education for Nurses (QSEN, 2010) identified competencies which address the challenge of preparing future nurses with the knowledge, skills, and attitudes necessary to improve the quality and safety of the health care systems in which they work. Despite possessing well-delineated criteria for successful outcomes, what remains clear is that nurse educators continue to be challenged with the preparation of future nurses to render safe care (Heslop, McIntyre, & Ives, 2001).

The Joint Commission, which accredits health care organizations in the United States, found that nurses are ill-prepared to render safe patient care (Joint Commission, 2010). Although 50% of the Joint Commission standards are directly related to safety, 42% of new nurses report that they were unprepared to use national patient safety resources (Kovner, Brewer, Yingrengreung, & Fairchild, 2010). Recognizing the enormity of this predicament, the leadership at the Joint Commission called for educational strategies that stress the enhancement of skills, attitudes, and behaviors indispensable to the provision of safe care (Kovner et al., 2010). Furthermore, nurse

educators are encouraged to use pedagogies of experiential learning that can enhance clinical inquiry (Benner, Hughes, & Sutphen, 2001).

As a teaching strategy, simulation offers mechanisms by which students can participate in clinical decision making, practice skills, and observe outcomes from clinical decisions (Brannan, White, & Bezanson, 2008). As a tool of experiential learning, simulation has been adopted by other industries and disciplines to address safety issues (Bradley, 2006; Eaves & Flagg, 2001; Gordon, Wilkerson, Shaffer, & Armstrong, 2001; Hunt, Nelson, & Shilkofski, 2006). Even as nurse leaders openly advocate for more innovation in nursing education (Bellack, 2008; Coonan, 2008; Dreher, 2008; Gabrud-Howe & Schoessler, 2008; Ironside & Valiga, 2007; Tanner, 2008; Unterscheutz, Hughes, Nienhauser, Weberg, & Jackson, 2008), but nurse educators have been reluctant to explore simulation as a teaching modality (Akhtar-Danesh, Baxter, Valaitis, Stanyon, & Sproul, 2009). However, with beginning research showing promise and support for simulation in nursing instruction, nurse educators face the challenge of exploring this innovative technology and its potential impact as a complement to clinical learning (Decker, Sportsman, Puetz, & Billings, 2008). To contribute to this knowledge base, this study evaluated human patient simulation's (HPS) impact on junior student nurses' critical thinking and confidence skills

## Problem Background

Historically, developing and refining critical skills for safe practice were acquired in the classroom and applied in clinical settings (Moyer & Wittmann-Price, 2008). Student nurses learned to apply theories of action to genuine clinical problems and become socialized to the professional role (Koernig-Blais, Hayes, Kozier, & Erb, 2006).

With the advent of human patient simulation, nurse educators have another contributive adjunct to clinical teaching. Durham and Alden (2008) concurred that simulation places the emphasis on the needs and preferences of contemporary nursing students, and therefore provides an alternative to traditional approach to nursing education. Alinier, Hunt, Gordon, and Harwood (2006) stated that human patient simulation may be the strategic tool instrumental in creating experiences that augment critical thinking skills and confidence in student nurses. Critical thinking has long been recognized as a core competency in adult education and is recognized as a primary tool for making better judgments (Moore & Parker, 2009). As Giancarlo and Facione (2001) asserted, "critical thinking remains a central goal of the educational process" (p. 3). As a nursing program outcome, critical thinking is integrally connected to the future nurse's ability to use reflective judgment, problem framing, and higher order thinking (Giancarlo & Facione, 2001). Consequently, the ability to think critically is a requisite to functioning safely and proficiently in complex healthcare organizations (Mottola & Murphy, 2001).

Students equipped with confidence in their critical thinking skills are best disposed to bridge learning gaps in practice (Suliman & Halabi, 2007). Facione and Facione (1996) supported this idea as they identified confidence as an important component of critical thinking ability. They considered self-confidence to be important for nurse educators to promote in educational programs (Facione & Facione, 1996). Educators have the primary responsibility to facilitate students' ability to make the vital link between theory and practice (Reilly & Oermann, 1999). As Facione (1990) explained: "Instruction should bridge the gap between the subject and the student's own experience" (p. 17). Notwithstanding the enormity of this contemplated task, simulation

may offer nurse educators an alternate teaching modality to bridge that gap. In doing so, educators can facilitate the acquisition of critical thinking skills and prepare safer nurses. Thus, the necessity to explore the value of simulation in nursing education is evident. Furthermore, there is no evidence found that this particular study has been previously conducted in south Florida.

## Purpose of the Study

The purpose of this study is to evaluate the impact of human patient simulation (HPS) on junior student nurses' critical thinking and confidence skills. In 2003, the National League for Nursing (NLN) recognizing the challenges and immediacy of educating future nurses to enter complex healthcare systems called for innovative and dramatic reform in the education of prospective student nurses. The NLN (2003) stated: "Faculty, students, consumers and nursing service personnel must work in partnership to design innovative educational systems that meet the needs of the health care delivery system now and in the future" (p. 1). The Institute of Medicine (2000) called for the evaluation of current approaches for building new systems to improve patient safety. Equally important is the request from the leadership of the Joint Commission (2010) for educational approaches that emphasize development of skills, attitudes, and behaviors that are foundational to the provision of safe care. Furthermore, a national accreditation body, the Commission on Collegiate Nursing Education (CCNE) recognized that "advancements in technology may complement or supplant traditional pedagogical methods" (CCNE, 2009, p. 9). With these calls to reassess curricular structures and processes, and the need for a safer health care arena, nurse educators are faced with an urgency to strategize on how best to prepare future nurses for safe practice. The desired

reality is that upon graduation, new nurses possess the basic knowledge and skills to practice safely.

Clinical nursing education is being transformed to align with changing health care trends (Wolff, Regan, Pesut, & Black, 2010). If future nurses are not provided with the opportunity to enhance their critical thinking skills in training, they will be at risk for not meeting the expectations of the present healthcare industry (Heslop et al., 2001). Nurse educators have the responsibility to develop student nurses' essential skills needed to function safely and autonomously in the complex health care area (AACN, 2008). Nurse-experts in human patient simulation (HPS) support the use of the technology as an adjunct to clinical teaching (Jeffries, 2007; Lasater, 2007; Medley & Horne, 2005). Therefore, the idea of using human patient simulation as an educational strategy to improve nursing students' clinical skills is becoming an area worthy of exploration. What is lacking is the concrete and decisive evidence linking simulation to students' critical thinking and confidence to make decisions for safe patient care. Investigating simulation's value in increasing those parameters in clinical education may be a meaningful way to add insight and much needed data to this instructive proposition (Harlow & Sportsman, 2007).

Human patient simulation is suitable for study because as a tool for student-centered learning, the method calls for interactive teaching strategies that adequately prepare future nurses to solve problems nurses encounter in the real world (Wong et al., 2008). Used efficiently, simulation facilitates tasks that require "intentional, active, constructive, cooperative, and authentic learning processes which result in more meaningful learning" (Jonassen, Howland, Marra, & Crismond, 2008, p. 22).

Consequently, the innovative and creative use of simulation that appeals to students can offer a critical approach toward fulfilling scholarly excellence and realistic preparation for clinical practice (Smith, 2009). By probing into how best to integrate these measures to advance clinical competence, nurse educators are positioned to broaden their ability to yield positive results in nursing education at the college level (Tuoriniemi & Schott-Baer, 2008).

## Nature of the Study

Based on the research questions and the phenomenon studied, a quasi-experimental study was employed. To provide an explanation of the stated variables, a quantitative methodology, and a pretest-posttest research design was used. A pretest-posttest design involves the observation of the dependent variables (critical thinking and confidence skills) at two points in time. This design permits the examination of the degree of change in the dependent variables as a result of the manipulation of the independent variable (simulation) (Polit & Beck, 2010). The choice of a quasi-experimental design was made because randomization was not possible or available for this study.

### Population and Sample

A convenience sample of third-quarter junior baccalaureate nursing students was assigned to control and experimental groups utilizing intact group assignment. This procedure was used to minimize disruptions to the learning environment. Creswell (2008) stated that a quasi–experimental design has the advantage of using existing groups in educational settings, but it introduces many threats that will need to be addressed. The experimental group participated in clinical simulations with clinical practice, whereas the control group participated in clinical practice only.

## Setting

This research was conducted at a moderately sized proprietary college of nursing in south Florida. The Bachelor of Science in Nursing (BSN) program is designed to provide students with an educational foundation that prepares them for entry into the nursing profession. This setting was chosen because of the convenience sample and the necessity to capture the perspectives of this population who are actively utilizing the teaching strategies described in the study. Additionally, the evidence for using the technology of simulation in this setting needs to be corroborated with relevant research.

## Instrumentation

Two primary instruments to quantify the students' critical thinking and confidence skills are Facione and Facione's (1990) California Critical Thinking Skills Test (CCTST), and Grundy's (1993) Confidence Scale (CS). In addition, a student survey developed by the researcher aggregated demographics data from the subjects being studied. Written permission was obtained for use of the tools.

## Data Analysis

Quantitative data from the validated California Critical Thinking Skills Test and Confidence Scale were analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to analyze the demographics data and the students' evaluation of the simulation experience. Pre- and post-confidence and critical thinking scores were compared using independent samples Mann-Whitney U test. Pearson correlation was used to identify if a correlation existed between the students confidence and critical thinking skills. "A correlation is a statistical test to determine the tendency or pattern for two or more variables to vary consistently" (Creswell, 2008, p. 356).

## Research Questions

The following research questions served to guide the study:

1. What effect does the use of human patient simulation have on junior nursing students' critical thinking skills?

2. What effect does the use of human patient simulation have on junior nursing students' clinical confidence skills?

3. Is there a correlation between junior nursing students' critical thinking skills [CCTST] scores and their [CS] confidence scores?

## Hypotheses

$H_o1$ – Human patient simulation has no significant effect on junior nursing students' critical thinking skills.

$H_o2$ – Human patient simulation has no significant effect on junior nursing students' confidence skills.

$H_o3$ – There is no significant correlation between junior nursing students' critical thinking and confidence skills.

These hypotheses were tested at a 0.05 significance level.

## Limitations

Specific limitations included the purposive sampling of junior nursing students at a proprietary college of nursing in south Florida. The complexity of clinical learning itself presented as a limitation. The lack of control over the varied clinical experiences that may also impact the students' growth in clinical skills and the different clinical instructors who teach the students are main limitations to this study. Those inconsistencies in clinical practices were not controllable. Another limitation was the choice of simulation the students experienced during their clinical simulation session.

One last limitation was the limited number of simulation sessions the students experienced. The students had three clinical scenarios per simulation session.

To minimize the inability to draw suitable conclusions from the research, the threats to internal validity were controlled. Threats of maturation and selection were minimized by selecting participants in the same cohort who are exposed to similar clinical experiences except for the treatment of simulation in the experimental group. The threat of history was minimized by keeping the intervals from pre- to post-testing to a minimum of 5 weeks.

## Delimitations

Delimitation was the small sample size in a limited geographical area and limited clinical simulation experiences the students underwent based on their clinical schedules. The convenient sample from this specific college of nursing may not be representative of most nursing students. Those characteristics limit the scope and the generalizability of the research's findings.

## Definition of Terms

*Baccalaureate junior nursing students*- students of mixed race; ethnicity, gender, and age who may be educationally prepared for competent entry into practice via the baccalaureate route (Masters, 2009).

*Clinical practice*- the provision of experiences with actual patients with authentic problems, which enable learners to use knowledge in practice, develop skills in problem solving and decision making (Reilly & Oermann, 1999).

*Confidence*- feelings or consciousness of one's powers or of reliance on one's circumstances (Merriam Webster Online Dictionary, 2010).

*Critical thinking*- "the purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based " (Facione, 1990, p. 2).

*Critical thinking skills*- the cognitive skills used interactively in the reflective reasoning process of making a judgment about what to do or believe in a given context (Facione & Facione, 2008).

*Debriefing*- "facilitator-led participant discussion of events, reflection, and assimilation of activities into their cognitions" (Fanning & Gaba, 2007, para. 13).

*Human patient simulation*- refers to a tool for experiential learning that provides a mechanism by which students can participate in clinical decision making, practice skills, and observe outcomes from clinical decisions (Brannan et al., 2008).

*Simulation*- refers to an attempt "to replicate some or nearly all of the essential aspects of a clinical situation so that the situation may be more readily understood and managed when it occurs for real in clinical practice" (Morton, 1995, p. 76).

## Importance of the Study

One of the challenges facing nursing education is the necessity to find meaningful and safe learning opportunities to prepare student nurses to function in an ever-increasing complex and technical clinical realm (NLN, 2003). Furthermore, the National Council of State Boards of Nursing (2005) supports the inclusion of innovative teaching strategies that complement clinical experiences for entry into practice competency. Refurbishing curricular processes underscore the importance of this study to the field of nursing instruction as educators strive to prepare nurses to think critically and function with

confidence. Simulated situations in a safe environment could be another accessory in the comprehensive context of preparing safe practitioners (Martin, 2002). Because clinical confidence and critical thinking are essential skills for safe practice and could be imparted via simulation (Horan, 2009), validating the impact of the human patient simulation on those critical skills could strengthen the evidence needed to support the integration of this tool in clinical education.

The idea of using human patient simulation (HPS) as an educational tool to improve nursing students' clinical skills is an area worthy of exploration (Jeffries, 2007). Although no definitive evidence exists showing that HPS is a reliable method of evaluating how students will perform in real life, investigating its value in nursing education may be a meaningful way to add insight and much needed data to this educational innovation (Harlow & Sportsman, 2007). The argument that (HPS) is an effective technique in improving students' critical skills remains uncorroborated by systematic and controlled evidence. The largest proportion of the studies support the premise that HPS is a viable teaching tool (Cato, Lasater, & Peeples, 2009; Childs & Sepples, 2006; Dearman, Lazenby, Faulk, & Coker, 2001; Decker et al., 2008), yet studies to validate student nurses' perceived critical skills abilities and confidence remain sparse. Bradshaw and Lowenstein (2010) agreed that simulation in nursing is in its infancy, and because research correlating human patient simulation with the acquisition of critical thinking skills and clinical confidence has not been addressed, the need for further research still exists. Therefore, evaluating the impact of human patient simulation on junior student nurses' critical thinking and confidence skills remains a creditable area for examination.

## Problem Statement

Past research has indicated that the use of simulation in nursing is in its infancy (Bradshaw & Lowenstein, 2010) and that research showing the use of the human patient simulation in the acquisition of critical thinking skills and clinical confidence has not been addressed (Jeffries, 2007). Therefore, the need still exists to understand if student nurses can attain critical thinking skills and clinical confidence from using human patient simulation. Accordingly, the problem requiring further inquiry is, Does the use of human patient simulations have an effect on junior nursing students' critical thinking and confidence skills.

## Summary

Simulation as a teaching tool may promote the development of critical thinking and confidence skills of new graduate nurses entering the workforce (Brannan et al., 2008; Horan, 2009; Lasater, 2007; Mottola & Murphy, 2001). New knowledge gained from this study may further support simulation's use in nursing education. Complex healthcare systems demand competent nurses who can think critically and are confident about their skills (AACN, 2008). Synergistic application of simulation as a strategic instructional tool remains a prolific area in need of further exploration. With support and cooperation from the chair of the nursing program, this study may uncover and give substantiation to the pedagogical leanings of simulation as an instructional tool for student learning.

## Organization of Chapters

In Chapter Two, a careful analysis of relevant research literature provides a historical perspective of simulation and an explication of the theoretical framework and

foundation for the study. Based on the research questions, a quasi-experimental methodology, with a pretest- posttest design is described in Chapter Three. The instrumentation, procedures for conducting the study and processes for presenting the data are described in the third chapter. The data analysis and findings of the study are explained in Chapter Four. Chapter Five contains a summary of findings with implications for the use of simulation and recommendations for future research.

# CHAPTER TWO: REVIEW OF THE LITERATURE

This study evaluates human patient simulation's (HPS) impact on junior student nurses' critical thinking and confidence skills. A literature review to evaluate prior research on the use of simulation will serve as a foundation for the investigation. Understanding the relationships between the variables that undergird the study is necessary to conceptualize the topic under examination. First, theoretical components of a constructivist conceptual framework that can guide educators in simulation will be explained. Vygotsky's constructivism theory of learning will be reviewed in terms of its background and its application and utility to simulation. This topic also includes a discussion of the movement from traditional education to active learning, which generated the interest for constructivist theory of learning in the clinical simulation arena. Concepts of critical thinking and Bandura's (1977) self-efficacy and confidence as they relate to current uses of simulation in nursing are explored. This chapter concludes with the history of simulation as an educational tool and its advent as a teaching strategy in nursing clinical education.

## Constructivist Theory

The constructivist paradigm posits that knowledge is dependent of and internally constructed by the learner as a way of making meaning of experiences (Jonassen, Davidson, Collins, Campbell & Haag, 1995). This concept embraces the view that experiences, teachings, and exposure to the external world influence knowledge construction (Jonassen et al., 1995). Knowledge is conceived as embedded in and connected to the situation where the learning occurs (Applefield, Huber, & Moallem,

2000). As a consequence, thinking and knowledge constructed are tied to the immediate social and physical context of the learning (Applefield et al., 2000).

Constructivist theory states that individuals construct meaning through various experiences, producing critical thinkers (Argosy University, 2009). Constructivists believe that in order for learning to take place, new information must tie into existing values, beliefs, and knowledge (Richardson, 2003). Educators who use a constructivist approach focus on the student's ability to solve real life-practical problems while the student constructs knowledge rather than simply passively receiving it from experienced instructors (Can, 2009).

Grounded in the research of Piaget, Dewey, and Vygotsky, constructivist perspectives propose that learners actively construct their own learning (Woolfolk-Hoy & Kolter-Hoy, 2009). Piaget, as cited in Jacobsen, Eggen, and Kauchak (2009), addressed the significant role played by the environment in providing experiences to which the individual must react. Piaget's philosophy focused on learner experiences that advanced the learner from perceptual, to concrete, and finally abstract knowledge (Jacobsen et al., 2009).

From an epistemological viewpoint, constructivism is essentially a philosophical explication about the nature of knowledge and how it is constructed (Schunk, 2008). Dewey's perspectives intended that "educative experiences be social, connected to previous experiences, embedded in meaningful contexts, and related to students' developing understanding of content" (Windschitl, 2002, para 9). Dewey further believed that these activities should be meaningful, practical, and that learning should be a continuous lifelong experience (Jacobsen et al., 2009). Dewey believed that those

typical modes of activity, whether play or useful occupations were more desirable when steeped in reflection and use of judgment (Sidorkin, 2009).

Vygotsky's constructivist theory stresses the idea that learning is a socially mediated process, situated in physical and social contexts (Schunk, 2008). Vygotsky emphasized scaffolding, or mediated learning whereby students are given complex, difficult, and realistic tasks with the necessary support to achieve them (Slavin, 2006). Scaffolding or mediated learning is aided by reflective teaching whereby students and practicing nurses improve their cognitive and metacognitive skills in clinical contexts (Kuiper &Pesut, 2004). Nurse educators help accomplish this by using self-regulated learning strategies to support teaching and learning of reflective clinical reasoning in nursing practice (Kuiper & Pesut, 2004).

A central concept in Vygotsky's theoretical system is the role of social collectivity in individual learning and development (Liu & Matthews, 2005). This model stresses social group learning with peer collaboration (Ratner, Foley, & Gimpert, 2002) and supports the idea that a range of skills attained with adult guidance and teamwork exceeds those skills attained alone (Liu & Matthews, 2005). Clinical components of nursing courses adapt this constructivist perspective as part of the clinical experience (Dickieson, Carter, & Walsh, 2008). Nursing students enhance their learning when they are immersed in communities of practice alongside expert nurses (Gieselman, Stark, & Farruggia, 2000). Identified by Vygotsky as the zone of proximal development (ZPD), this form of collaboration represents the gap between what the learner achieves alone versus what the learner can best achieve with the help of a mentor (Atherton, 2009).

Marlowe and Page (1998) and Driscoll (2005) listed the following precepts as germane to the constructivist theoretical framework for active learning:

1. authentic tasks and complex, challenging learning environments;
2. social negotiation and shared responsibility as a part of learning;
3. multiple representations of content;
4. understanding that knowledge is constructed;
5. student-centered instruction.

Another central assumption of constructivism is that tools and signs mediate learning (Schunk, 2008). Technology, as a tool, transcends "the designs and environments that engage learners" (Jonassen, Peck, & Wilson, 1999, p. 12). Both constructivism and technology focus on the creation of learning environments and complement each other (Jonassen et al., 1999). Viewing technology as a tool, Jonassen et al. (1999) suggested its use to support knowledge construction to engage and facilitate students' thinking. Seeking to embrace multiple perspectives, the constructivist framework shares a symbiotic relationship with technology to challenge the learners' thinking (Duffy & Cunningham, 1996).

**Constructivism in Nursing Education**

Constructivism supports construction of knowledge by the individual (Karagiorgi & Symeou, 2005). Within nursing education, constructivist pedagogies are relatively unexplored even though learners who undertake bachelor of nursing degree programs are adults (Heller, Oros, & Durney-Crowley, 2000). As such, those learners have significant life experiences and a vast amount of knowledge that has been acquired both formally and informally (Heller et al., 2000). Adult learners enjoy problem centered and

meaningful learning unique to their life situation, and learn best when they can directly apply what they have learned (Merriam, 2001). With the increasing awareness to incorporate innovative pedagogy in nursing curricula, constructivist epistemology offers an alternative to traditional pedagogy (Gardner, Deloney, & Grando, 2007).

The concept of constructivism in nursing education is supported by Peters (2000) who advanced that constructivist epistemology focuses on student learning and results in the building, modification, and expansion of new knowledge. He stated "the focus on student and previous learning serve as a foundation upon which to modify, build, and expand new knowledge" (Peters, 2000, p. 170). With an affinity for self-directed learning, constructivism draws a parallel to adult education theory and therefore offers a tremendous potential for its enhancement in nursing education (Young, 2008). The goal of nursing education is to produce highly capable practitioners with the ability to self-reflect and evaluate situations (Giddens et al., 2008). A constructivist approach could provide a backdrop for the best practices that allow these epistemological positions to germinate.

As a basis for teaching, constructivism possesses some ambiguities and tensions (Kirschner, Sweller, & Clark, 2006; Windschitl, 2002). Constructivism's universalized claim of applicability to all learning settings is inappropriate (Bailey & Pransky, 2005). However, Benner (2001) explained that a sound background in the theoretical foundation of nursing is indispensable for nurses to advance their clinical expertise. Peters (2000) postulated that nurse education within a constructivist framework offers better opportunities for improved learning of modern practice than traditional behavioral based pedagogy. He offered a convincing argument that self-direction in learning and

metacognitive development enhances students' problem-solving and reflective skills essential for real world nurse practice. Brandon and All (2010) summarized an analysis of constructivism and suggested the innovative application of its active-learning principles to nursing curriculum development.

**Constructivism as a Framework for Simulation**

The assessment of theory-based research and high fidelity simulation by Rourke, Schmidt, and Garga (2010) expanded the understanding of constructivism and simulation in nursing education. They reported that 45% of empirical studies on simulation and nursing education made no use of theory, while 45% made minimal use of theory, and 10% made adequate use (Rourke et al., 2010). They listed constructivist theory as used minimally in empirical studies using simulation and nursing education from 1989 to 2009. Parker and Myrick (2009) echoed this notable scarcity of the lack of simulation research based on theory. They highlighted the lack of research framed in a pedagogical philosophy to guide simulation as a technology based learning tool. In a critical analysis of the application of behaviorist and constructivist pedagogy to high-fidelity scenario-based simulation sessions, they enumerated the need for nurse educators to draw on both constructivist and behaviorist educational philosophies to meet the needs of adult learners. Demirbilek (2004) reviewed the potential benefits of simulation in the constructivist environment, and advanced that well designed simulations can be meaningful in producing effective rich learning environment for students.

Studies addressing simulation in the context of a constructivist pedagogical framework are limited. Moss, Grealish, and Lake (2010) affirmed that pedagogies addressing the needs of the adult learner and simulation are lacking in the nursing

literature. In an evaluation of a graduate nursing course, Moss et al. (2010) attested that constructivist pedagogies used with graduate students may be different from those used with undergraduate and continuing education students. They argued that graduate pedagogies move nursing education away from integration and toward a tension between theory and practice (Moss et al., 2010). Other investigators evaluated constructivist learning environments and simulation to improve communication skills of sophomore students (Zavertnik, Huff, & Munro, 2010), psychiatric nursing students empathy (Webster, 2010), and cultural competence (Hunter, 2008; Hunter & Krantz, 2010).

A core premise of constructivism is that cognitive processes are situated in physical and social contexts (Von Glasersfeld, 1995). As such, the methodology used should be embedded within a sound learning theory that supports the method (Bell, 2004). In this study, the constructivist theory of learning supports the use of simulation as a teaching strategy. The integration of technology fortifies the convergence of learning theory with the learners' desire to learn. Karagiorgi and Symeou (2005) suggested that instructional designers be well informed with the epistemological foundations of educational theories and their effect on the process of instruction. Constructivist principles can be seamlessly adapted to simulation exercises whereby adult students are provided with experiences that challenge their thinking and force them to rearrange their beliefs (Schunk, 2008).

Consequently, in keeping with teaching strategies that encourage active learning, collaboration, and high student participation, this study is structured in a constructivist framework and grounded in the cultural context of clinical nursing. Despite the existence of some legitimate claims of limitation, the use of constructivism has demonstrated its

utility in traditional education (Windschitl, 2002). Simulation relates well to the constructivist model of creating personal meaning based on individual experiences (Hung, Chee, Hedberg, & Seng, 2005). Skill acquisition in simulation is congruent and blends seamlessly within a constructivist framework (Hung et al., 2005). The need for theory-based investigations for using simulation in nursing education is underscored by Benner (2001) and Rourke et al. (2010). Within a constructivist framework, this study evaluates the effects of using simulation as a teaching/learning modality on the critical thinking and confidence skills of junior nursing students.

## Concept of Critical Thinking

Early explications of the concept of critical thinking can be traced back to Greek philosophers such as Socrates, Plato, and Aristotle (Paul, Elder, & Bartell, 1997). Socrates embraced questioning to develop further thinking, Plato subscribed to the philosophy of educators enabling examination and reflection of values and ideas, and Aristotle recognized a relationship between thinking and the intellect (Paul et al., 1997). However, Dewey (1910) differentiated between the progression and outcome of thinking through reflective thinking. He identified the essence of critical thinking to be "… suspended judgment … to determine the nature of the problem before proceeding to attempt its solution" (Dewey, 1910, p. 74).

Authors continue to advance definitions of critical thinking to encompass not only the philosophical realm but also the educational facets of the concept. Ennis and Milman (1985) classified critical thinking as reasonable, reflective thinking focused on what to believe or do. Halpern (1989) characterized critical thinking as a purposeful goal-directed thinking, Paul and Heaslip (1995) described it as the art of thinking about

thinking while thinking to make thinking better, and McPeck (1990) labeled it a propensity to engage in an activity with reflective skepticism. Critical thinking has also been defined as "a higher order of reasoning used in reaching professionally informed judgments in high stakes, time constrained, and many times novel problem situations" (Facione & Facione, 1996, p. 41). Critical thinking has been classified as a process; systematic reasoning, reflective thinking, and an amalgam of knowledge, skills, application of reason, and attitude; and a skill to enhanced learning (Bandman & Bandman, 1988; Brookfield, 1987; Johnson, 2000; Mezirow, 1990; Moore & Parker, 2009; Ruggiero, 2009; Watson & Glaser, 1964).

To reach a consensus on the definition of critical thinking, a 2-year Delphi project spearheaded by the American Philosophical Association (APA) conceptualized the following definition: "critical thinking is purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based typifies it as purposeful, self-regulatory judgment" (Facione, 1990, p. 2). Other explanations describe the concept as an "intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (Scriven & Paul, 2008, para. 4).

**Critical Thinking in Nursing**

The literature is not lacking for comparable definitions of critical thinking. Nursing, a highly skilled profession, requires its practitioners to have the ability to think

critically (Zygmont & Schaefer, 2006). Acquiring a definition of critical thinking specific to the profession is essential in guiding the practice and the suitability of the construct. Among the earlier nursing leaders to write about critical thinking, Pless and Clayton (1993) described critical thinking characteristics to include interpretation, analysis, evaluation, inference, explanation, and self-regulation. Oermann (1997) explained the concept as a thought process necessary for effective problem solving and decision-making. Alfaro-Lefevre (1999) suggested that critical thinking in nursing is reflective of the nursing process whereby outcome-directed thinking is driven by patients' needs.

To add clarity to overlapping definitions of critical thinking, nurse scholars advanced frameworks of the concept to define it better for the practice of nursing. Borrowing from conventional perspectives, several nursing experts developed nursing-specific models of critical thinking (Beeken, 1997; Dexter et al., 1997; Ford & Profetto-McGrath, 1994; Greenwood, 2000; Jackson, 2004; Kataoka-Yahiro & Saylor, 1994; Miller & Babcock, 1996; ONeill & Dluhy, 1997, Videbeck, 1997). After replicating the APA study with nurse experts from 10 countries and 23 states, Schefer and Rubenfeld (2000) agreed on the following description:

> Critical thinking is an essential component of professional accountability and quality nursing care. Critical thinkers in nursing exhibit these habits of the mind: confidence, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance, and reflection. Critical thinkers in nursing practice the cognitive skills of analyzing, applying standards, discriminating,

information seeking, logical reasoning, predicting, and transforming knowledge. (p. 7)

Critical thinking is deemed an integral outcome in nursing education. The National League for Nursing Accrediting Commission (NLNAC, 2008) and American Association of Colleges of Nursing (AACN, 2008) require the concept of critical thinking to be included as one of the core elements of curricula and that it be measured as an outcome when evaluating nursing education. Nurse educators agree that critical thinking offers a perspective congruent with the realities of the nursing profession (Staib, 2003). They also concur that critical thinking is essential for competent nursing practice (Beckie, Lowry, & Barnett, 2001; Cody, 2002; Etheridge, 2007; Hicks, 2001; Ignatavicius, 2001; Profetto-McGrath, 2005; Spelic et al., 2001; Suliman & Halabi, 2007). Although some leaders contend that critical thinking as a nursing concept has matured since its first appearance in the literature (Tanner, 2006a), others decry the deficiency of critical thinking skills in nursing students and new nurses alike (DelBueno, 2005; Fero, Witsberger, Wesmiller, Zullo, & Hoffman, 2009). Research to reconcile the divergent views have created an appreciation for the lack of a standardized characterization of critical thinking in nursing, and the difficulty on how best to measure a concept that is not clearly defined.

**Critical Thinking Measurements**

Agreement on a working definition of critical thinking underscores the necessity to adopt an adequate measurement to meet the outcome criteria required by the nursing profession's accrediting bodies (Benner et al., 2001). Nursing accrediting bodies do not provide critical thinking tools to measure critical thinking outcome standards (National

League for Nursing Accrediting Commission (NLNAC, 2008). That lack of direction gives nursing programs the discretion of choosing the tool to make that determination (Benner et al., 2001). Several critical thinking tools are described in the literature. Brunt (2005) identified five tools: the Watson-Glaser Critical Thinking Appraisal (WGCTA), California Critical Thinking Skills Test (CCTST), Ennis-Weir Critical Thinking Essay Test, Cornell Critical Thinking Test, and the California Critical Thinking Disposition Inventory (CCTDI). They all evaluate elements of the nursing process, but they are not nursing-specific and do not capture the sophistication of critical thinking in nursing (Brunt, 2005).

Other tools designed to measure critical thinking in nursing programs include the Assessment Technologies Institute's (ATI) instrument, the Critical Thinking Assessment (CTA), the Nurse Entrance Test (NET), the Critical Thinking Process Test (CTPT), and the RN Assessment Test (Romeo, 2010). Furthermore, the National League for Nursing (2010) formulated the Critical Thinking in Nursing Practice/RN Examination, while the Health Sciences Reasoning Test, an adaptation of the CCTST, was designed specifically for health science students and professionals (Facione & Facione, 2006). The Critical Thinking in Nursing Practice/RN Examination was developed for students near completion of their coursework. Framed in terms of the nursing process, the 120 individual items test assesses the critical thinking ability of nursing students. The test items assess the construct of critical thinking as defined by the National League for Nursing (NLN) Think Tank on critical thinking (National League for Nursing, 2010). The Health Sciences Reasoning Test, an adaptation of the CCTST, is specifically designed to assess the critical thinking skills of health science students and professionals

(Facione & Facione, 2006). The Critical Thinking Process Test (CTPT) was designed to assess critical thinking of nursing students (Educational Resources, Inc., 2010). The test questions measures six levels of abstract thinking and five critical processing skills and references nursing situations. Written specifically for nursing students, the CTPT stresses terminology and critical thinking process skills within a nursing environment (Educational Resources, Inc., 2010).

**Critical Thinking in Higher Education**

Using the CCTST and the disposition test, Cisneros (2009) studied pharmacy students' critical thinking skills at the beginning and end of one academic year and found no difference in critical thinking skills over time. He explained that instrument scores after one semester or one academic year may not accurately reflect influences on critical thinking by the curriculum experienced during that study period (Cisneros, 2009). Different suggestions came from Williams et al. (2003) who studied students from seven baccalaureate-level dental hygiene programs in the United States. They concluded the CCTST is a good predictor of initial student outcomes and may have efficacy for student selection and retention.

Several researchers examined relationships between instruction modes and critical thinking (Allen, 2008; Hicks-Moore, & Pastirik, 2006; Hoffman, 2008; Ozturk, Muslu, & Dicle, 2008; Pastirik, 2006; Sorensen & Yankech, 2008; Tiwari, Lai, So, & Yuen, 2006; Wheeler & Collins, 2003; Yuan, Kunaviktikul, Klunklin, & Williams, 2008). These studies explored differences in critical thinking scores when using educational strategies such as concept mapping, problem-based preceptorship, and traditional education. They found that teaching methods that embrace constructivist frameworks improved critical

thinking scores. Of relevance to this research is the meta-analysis by Abrami et al. (2008). They reviewed 117 studies for instructional interventions' effect on the development and effective use of critical thinking skills. The 117 studies based on 20,698 participants yielded 161 effects with an average effect size of 0.341 and a standard deviation of 0.610 (Abrami et al., 2008). They concluded that the moderate average effect was supportive of the view that instruction improves critical thinking skills and dispositions (Abrami et al., 2008).

**Critical Thinking Research in Nursing**

Several studies measuring the critical thinking concept in nursing disciplines have been published in the literature (Angel, Duffey, & Belyea, 2000; Beckie et al., 2001; Brown, Alverson, & Pepa, 2001; Giddens & Gloeckner, 2005; Shin, Ha, Shin, & Davis, 2006; Sorensen, & Yankech, 2008; Stewart & Dempsey, 2005). The studies were focused mainly on the development of critical thinking skills in nursing students, and measuring critical thinking as an educational outcome. Although investigators used diverse definitions of critical thinking across the studies, the measurement tools most frequently used were the CCTST and the WGCTA (Brunt, 2005). Follman (2003) suggested that most of the critical thinking tools used in nursing research did not adequately measure nursing outcomes, and he recommended the use of nursing context developed tests as better measurements of professional nursing practice.

Investigators using the CCTST and the CCTDI continue to add to the body of nursing knowledge and to the controversy of dichotomous results in critical thinking research. Colucciello (1997) examined critical thinking skills and dispositions of 328 baccalaureate-nursing students. The findings indicated a significant difference in the

total critical thinking disposition mean scores between students at the junior I and senior I and II levels and those at the sophomore II level (Colucciello, 1997). First semester junior students had the highest disposition and critical thinking scores followed by first and second year senior students; the groups' GPAs were considerably different (Colucciello, 1997). Thompson and Rebeschi (1999) found increases in skills and disposition of 38 BSN students. Statistically significant increases in truth-seeking and analytical subscale scores were noted, although the rise in the subscales was not significantly different (Thompson & Rebeschi, 1999). In a longitudinal, quasi-experimental study with 142 junior nursing students, Angel et al. (2000) focused on acquisition of knowledge and development of critical thinking skills. They reported significant gains in knowledge and critical thinking over the course of the semester. The variation in clinical teaching strategy structured versus unstructured health pattern assessment was the independent variable.

Following a curriculum revision that emphasized critical thinking, Spelic et al. (2001) evaluated critical thinking outcomes of a BSN program. They compared entry and exit scores on the CCTST to study students' gains in critical thinking skills (N = 136) (Spelic et al., 2001). They reported students in each of the three program tracks demonstrated significantly improved CCTST scores on all subscales and total scores with one exception. RN to BSN students' scores on the Analysis subscale approached but did not reach significance (Spelic et al., 2001).

In a pilot study of practicing critical nurses, Hicks, Merritt, and Elstein (2003) studied critical thinking skills in relation to educational preparation and the number of years of critical care experience. They found that education and experience were not

related to critical thinking ability, nor was critical thinking ability related to decision-making consistency among critical care nurses (Hicks et al., 2001). They concluded that more investigation was needed to determine how to measure critical thinking abilities in nurses because the measures used did not adequately capture the construct (Hicks et al., 2001).

Using a longitudinal descriptive design, Stewart and Dempsey (2005) examined nursing students' dispositions toward critical thinking as they progressed from the sophomore to senior semesters in a baccalaureate-nursing program. They found no relationship between passing the NCLEX-RN and CCTDI scores (Stewart & Dempsey, 2005). Significantly higher CCTDI scores were achieved in the Junior I and Junior II semesters, but no significant differences were found when comparing the Sophomore II and Senior II semesters (Stewart & Dempsey, 2005). Giddens and Gloeckner (2005) examined the relationship of critical thinking to performance on the NCLEX-RN and found that CCTST total scores were higher in participants who passed the NCLEX-RN; yet students did not significantly improve from entry to exit. In another study conducted by Shin, Jung, Shin, and Kim (2006), critical thinking measured with the CCTDI was significantly stronger at each level of South Korean nursing education (3-year associate, 4-year baccalaureate, and 5-year RN-to-BSN programs).

These investigations continue to interpret the critical thinking data as mixed and inconclusive, demanding further research. Results in the studies while providing useful information have implications for better study designs when measuring critical thinking (Polit & Beck, 2010). Suggestions for better-designed and rigorous studies in critical thinking to in nursing are well heeded.

## Concept of Self-Efficacy

Bandura's (1977) Model of Self-efficacy is a learning theory based on behavioral, social, and cognitive principles. The following review on self-efficacy focused on the application of cognitive achievement: learning, motivation, and academic performance with special emphasis on students in higher and nursing education. In 1994, Bandura defined perceived self-efficacy as "… people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (p. 71). Highly critical to the theory are the four identified factors that influence the cognitive processing of efficacy. Described as sources of efficacy expectations, these platforms postulate a common mechanism by which behavior changes occur (Bandura, 1977). One of the expectations, "vicarious experience" dictates that lived experiences are not the only source for acquiring mastery (Bandura, 1977, p. 197). Although a weaker process, modeling behavior with clear outcomes can be a productive means of influencing experience and infer mastery from modeling "Once established, enhanced self-efficacy tends to generalize to other situations" (Bandura, 1977, p. 195). Similar to Vygotsky's belief of community of practice, Bandura's social learning theory emphasizes the importance of observing and modeling the behaviors, attitudes, and emotional reactions of others (Bandura, 1977). Bandura (1977) stated "learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do" (p. 22).

The literature suggests that there is some relationship between self-efficacy and key motivation constructs such "as causal attributions, self-concept, optimism, achievement goal orientation, academic help-seeking, anxiety, and value" (Usher &

Pajares, 2008a, p. 751). One construct of self-efficacy includes self-judged confidence, which pertains to whether one can successfully execute a required behavior (Bong, 2006). Bandura (1977) established confidence as a judgment about one's perception of ability. He further suggested that confidence and self-confidence are a large component of the cognitive mechanism of self-efficacy. As self-efficacy increases, so does one's self-confidence. Schunk (2008) described self-efficacy as the individual's level of confidence and self-judgment regarding their ability to organize and implement actions to perform effectively. Leigh (2008) reported that several researchers on self-efficacy use the terms self-efficacy, confidence, and self-confidence interchangeably.

**Academic Self-Efficacy**

The research on the concept of self-efficacy in academia is robust. Lane and Lane's (2001) examination of postgraduate students suggested that self-efficacy has utility in academic settings. A significant proportion of the studies investigated instructional strategies as sources of self-efficacy information and development (Dunlap, 2005; Fencl & Scheel, 2005; Holden, Barker, Rosenberg, & Onghena, 2007; Rishel & Majewski, 2009). Research reviewed by Pajares (2002) identified a strong positive influence of efficacy beliefs on various aspects of student motivation and achievement. Hodges' (2008) review of the research on self-efficacy in academic settings revealed a focus on prior performance, modeling, goal setting, and characteristic feedback in traditional learning environments. The principal finding from the reviewed studies was that students' self-efficacy beliefs are significantly and positively related to academic performance (Hodges, 2008).

Self-efficacy and motivation were examined by Moos and Azevedo (2009) who analyzed research related to computer self-efficacy. Consistent with prior research on self-efficacy and computer-based learning (Cassidy & Eachus, 2002; Shapka & Ferrari, 2003; Torzadek & Van Dyke, 2002), Moos and Azevedo identified the inherent flaws of examining computer self-efficacy as a one-dimensional construct. They suggested further studies to measure computer self-efficacy and learning with different hypermedia and multimedia. They recommended that future research should account for relationship between computer self-efficacy and self-regulatory processes (Moos & Acevedo, 2009).

Other research has focused increasingly on self-efficacy of students and teaching methods that develop self-efficacy and confidence (Leigh, 2008). The argument that technology enhanced learning environment is effective in promoting academic self-efficacy is well documented (Demiralay & Karadeniz, 2010; Heaperman & Sudweeks, 2001; Piccoli, Ahmad, & Ives, 2001; Shriner, Clark, Nail, Schlee, & Libler, 2010; Sitzmann, Bell, Kraiger, & Kanar, 2009). While Lee and Witta (2001) reported that self-efficacy with online technologies was a poor predictor of student success, several researchers suggest that Internet self-efficacy might foster preferences of constructivist learning environments (Hsu & Huang, 2006; Joo, Bong, & Choi, 2000; Liang & Tsai, 2008; Usher & Pajares, 2008b; Wang, Ertmer, & Newby, 2004).

Subsequent inquiries reviewed by Hodges (2008) highlighted the development of self-efficacy beliefs in online environments as well as self-efficacy assessment issues. Studies revealed that developments in technology offer an opportunity to enhance the way students learn and teachers teach (Girasoli & Hannafin, 2008). Technology-enhanced learning environments that deliver instructional content that support

independent student learning may intentionally promote academic self-efficacy (Girasoli & Hannafin, 2008).

Research on self-efficacy and self-concept by Pajares (2002) reinforced Bandura's conviction that self-efficacy beliefs play an important role in human agency (Bandura, 2001). General trends are apparent in the studies Pajares cited and implied that students' self-beliefs about their academic capabilities are essential components of motivation, self- regulation, and academic achievement. Self- efficacy is reported to be a robust and consistent predictor of achievement and retention in academic settings (Fencl & Scheel, 2005; Lauder et al., 2008; Majer, 2009; Pajares & Schunk, 2001; Vuong, Brown-Welty & Tracz, 2010; Zajacova, Lynch, & Espenshade, 2005; Zimmerman, 2000).

**Self-Efficacy and Confidence in Nursing Education**

Bandura's (1977) learning theory continues to be applicable for educators as Gore (2006) conceded that self-efficacy plays a significant role in explaining students' motivation and learning. Alfaro-Lefevre (2009) acknowledged that self-confidence is a positive characteristic of critical thinkers, while low self-confidence can lead to a reduction of mental and physical stamina necessary for learning. The concept of self-efficacy supports the notion that an individual's belief on their ability to be successful in an endeavor has a direct influence on performance (Peterson & Arnn, 2005). Confidence affects efficacy expectations and behaviors based on the individual's success, failures, and comfort in performing that task (Bandura, 1994). White (2009) presented a clear explanation of self-confidence and its importance for both students and professional nurses; and Zulkosky (2009) provided a detailed analysis of performance

accomplishment as it relates to feelings of increased self-efficacy. In nursing, the lack of self-efficacy in students attempting to learn new skills necessary for their development as competent practitioners continues to be a concern for nurse educators and administrators (Myers et al., 2010).

Several studies have addressed students' level of self-efficacy as a significant predictor of self-rated confidence skills (Babenko-Mould, Andrusyszyn, & Goldenberg, 2004; Gonzalez, Groom, Spalding, Colin, & Johnson, 2009; Wagner, Bear, & Sander, 2009). Self-confidence is an essential component for transitioning nursing students into adept proficient nurses (Almada, Carafoli, Flattery, French, & McNamara, 2004). Studies addressing self-efficacy and nursing students have investigated student outcomes, mentoring relationships, research education, teaching strategies, and communication (Halcon, Chlan, Kreizer & Leonard, 2005; Raica, 2009; Roberts, Vignato, Moore, & Madden, 2009; Swenson-Britt & Reineck, 2009). Others have advanced that clinical strategies may enhance students' self-efficacy and impact their educational performances (Chlan, Halcon, Kreitzer, & Leonard, 2005; Lundberg, 2008; Moscaritolo, 2009; Theobald & Mitchell, 2002). Several researchers have noted a number of approaches to measure self-efficacy and competence (Babenko-Mould et al., 2004; Cheraghi, Hassani, Yaghmaei, & Alavi-Majed, 2009; Fereday & Muir-Cochrane, 2006; Freiburger, 2002; Opacic, 2003).

**Self-Efficacy and Confidence and Simulation**

Investigations of self-efficacy in relation to simulation strategies are sparse. Various researches indicate that simulation has a positive effect on nursing students' self-efficacy (Hoffmann, O'Donnell, & Kim, 2007; Jeffries, Rew, & Cramer, 2002; Leigh,

2008; McWha, 2008; Reilly & Spratt, 2007). Pike and O'Donnell (2010) explored simulation as a learning strategy to enhance students' self-efficacy. They measured learner self-efficacy before and after a clinical simulation session. Responses to questions on the post-test questionnaire yielded questions that were further explored in focus group interviews of nine participants (Pike & O'Donnell, 2010). Themes of low self-efficacy in communication and the need for authentic clinical simulations were highlighted. Although limited in scope, the study substantiated the need for learning experiences within clinical simulation to be more authentic, to improve the theory to practice gap (Pike & O'Donnell, 2010).

A study by Bambini, Washburn, and Perkins (2009) evaluated simulated experiences as a method to increase the self-efficacy of nursing students during their initial clinical course in a prelicensure program. Their results indicated that students experienced a significant increase in self-efficacy ($p < .01$) (Bambini et al., 2009). Wagner et al. (2009) supported the use of simulation as an approach to assist nursing students to acquire confidence and competence in the specialty area of maternal and infant care situations. Prior to their clinical experience, 64 nursing students were exposed to a simulated discharge teaching session in addition to lectures and independent reading assignments (Wagner et al., 2009). At the conclusion of the course, 64 nursing students completed a survey designed by the clinical faculty to determine students' level of confidence in implementing postpartum and newborn teaching as well as satisfaction with this teaching experience. The ratings of the experience were overwhelmingly positive (Wagner et al., 2009).

In a mixed-methods study, Sinclair and Ferguson (2009) used simulation to assess students' perceptions of self-efficacy for nursing practice. After being exposed to a combination of lecture and simulation, nursing students rated their perceptions of self-efficacy, satisfaction and effectiveness of this teaching strategy. Within the context of Bandura' s self-efficacy theory, the authors report data to suggest that students' self-confidence for nursing practice may be increased through the use of simulation (Sinclair & Ferguson, 2009).

In a quasi- experimental study, Blum, Borglund, and Parcells (2010) underscored the paucity of data supporting high fidelity simulation's effectiveness on nursing students' self confidence and competence. Blum et al. (2010) studied the relationship between simulation and student's self-confidence and competence with the Lasater Clinical Judgment Rubric as the measurement tool. They reached similar conclusions of positive effect of simulation on student's confidence and competence (Blum et al., 2010).

Not all studies reported positive findings. Scherer, Bruce, and Runkawatt (2007) compared the efficacy of controlled simulation mannequin (SM) assisted learning and case study presentation on knowledge and confidence of 23 nurse practitioner (NP) students in managing a cardiac event (Scherer et al., 2007). They found no differences in knowledge test scores, although the control group scored higher on post-test confidence (p=. 040) (Scherer et al., 2007). Additionally, Feingold, Calaluce, and Kallen (2004) reported no statistically significant increased level of confidence following simulation in (n=65) undergraduate students. The research on self-efficacy and simulation is significant in its scarcity, and highlights the need for further study and clarification.

## Simulation in Nursing Education

Nursing education is an evolutionary process that has experienced a metamorphosis through different pedagogies from an apprenticeship model in the exclusive clinical setting to a holistic model in the college setting (Allen, 2010). When the education of nurses shifted from a hospital-based apprenticeship model to collegiate programs, the knowledge required for effective nursing practices continued to expand and increase in its complexity (Hood, 2009). The goal of nursing education is to produce confident practitioners who can think critically to make safe patient care decisions (Becker, Rose, Berg, Park, & Schatzer, 2006). Nurse educators have the obligation to balance student learning and patient safety (Oermann, Yarbrough, Saewert, Ard, & Charasika, 2009). To maintain that balance in clinical settings, nursing students often are not allowed to follow their clinical judgment but must adhere to the expert clinical decisions of the nurse or their instructors. Walsh and Seldomridge (2006) cautioned that too often faculty members interrupt students' critical thinking processes out of a need to maintain and advocate for patient safety.

With diminishing clinical practice encounters, student nurses face entry level to the profession with less than adequate skills for safe practice. DelBueno (2005) found that "35 percent of new RN graduates, regardless of educational preparation and credentials, meet entry expectations for clinical judgment" (p. 278). Clinical nursing education must align with changing health care needs and give future nurses the opportunities to enhance their practical and critical thinking skills (Wolff et al., 2010). The advent of clinical simulation offers a clear opportunity to augment clinical practices

with simulated patients as an adjunct to working with live patients (Jarzemsky, McCarthy, & Ellis, 2010).

**Emergence of Simulation**

A growing interest in using simulation for purposes of improving patient safety and patient care has emerged over the past few decades (Gaba, 2007). Simulation has been used in training and risk management of professionals in settings such as aviation, military, space, maritime industries, nuclear power production, and medicine since 1930 (Gaba, 2004; Galloway, 2009). In health care education, simulation is described as a tool for learning and practicing skills in a safe and interactive environment (Issenberg & Scalese, 2008). The authors surmised that educational programs that integrate simulation into the culture of learning tended to run successful programs. Issenberg and Scalese (2008) expound that simulation can span the continuum of educational levels and bridge multiple health care professions. They concluded that simulations are increasingly finding a place among health educators as tools for training (Issenberg &Scalese, 2008). In medicine, simulation is an integral part of the undergraduate, postgraduate, and continuing medical education curriculum (Lane, Slavin, & Ziv, 2001). Computer-based simulations have been developed in clinical areas of neurology, nephrology, rheumatology, and anesthesiology (Lane et al., 2001). Galloway (2009) proposed using simulation techniques to bridge the gap between novice and competent healthcare professionals. Several authors attest to the utility and value of simulation as an adjunct to medical education (Carroll & Messenger, 2008; Fort, 2010; Hunt et al., 2006; Issenberg, McGaghie, Petrusa, Gordon, & Scalese, 2005; Ziv, Small, & Wolpe, 2000).

**Simulation in Nursing**

The development of computer technologies and the need to prepare clinically safe nursing practitioners are compelling reasons to weave conventional pedagogical clinical practices with emerging teaching tools that support students' internalization of critical information (Tuoriniemi & Schott-Baer, 2008). The diminishing availability of appropriate clinical sites is also cited as a convincing incentive to explore clinical simulation as an adjunct to other nursing teaching (Bearnson, & Wiker, 2005; Jeffries, 2008; Medley & Horne, 2005). State regulatory boards have begun to allow schools of nursing to substitute clinical simulations for a percentage of total traditional clinical hours (Nehring, 2008). Five states and Puerto Rico have made regulation changes to permit such substitution, and Florida has allowed no more than 25% as clinical simulation time. Sixteen states approve simulation substitution while 17 states are considering regulation changes concerning simulation (Nehring, 2008). These trends in clinical education imply a necessity and commitment from the healthcare simulation community to validate the credibility of this tool as an adjunct to clinical education (Gaba, 2007). Hicks, Coke, and Li (2009) reinforced using simulation as an adjunct to clinical education. Their study reported inconclusive findings of the efficacy of using simulation. They recommended clinical experience in combination with simulation training to provide the best performance outcomes (Hicks et al., 2009).

A number of studies sought to explore clinical safety and quality matters in conjunction with the use of simulation. A multisite study by Ironside, Jeffries, and Martin (2009) analyzed the impact of multiple-patient simulation experiences on the development of nursing students' patient safety. Using the Jeffries Simulation Model,

they investigated students' tolerance for ambiguity, grade point average (GPA), and age as they relate to simulation. The study showed those students' safety skills increased significantly from the first to the second simulation (Ironside et al., 2009). The researchers declared that the outcomes of the study were significant because they added credence to the impact of multiple-patient simulations on improving students' patient safety competencies prior to entering the workforce (Ironside et al., 2009).

The problems of quality and safety were illustrated by Sullivan, Hirst, and Cronenwett (2009) in their descriptive study of students' perspectives of quality and safety content in their nursing programs. Graduating students (n = 565) from 17 United States schools of nursing completed an evaluation survey to assess Quality and Safety Education for Nurses (QSEN) competencies in their curriculum (Sullivan, et al., 2009). The authors conveyed that students reported more exposure to QSEN knowledge areas in didactic learning than in clinical settings. The authors also emphasized that students embraced the importance of quality and safety competencies to professional practice (Sullivan et al., 2009)

Clinical simulation to reduce medical errors was explored by Sears, Goldsworthy, and Goodman (2009) who considered whether the use of clinical simulation could help reduce medication errors. Fifty-four students were randomly assigned to an experimental (treatment) group (24 students) or a clinical control group (30 students) (Sears et al., 2009). The treatment replaced clinical placement hours with a simulated clinical experience. Treatment occurred prior to medication administration. Sears et al. (2009) reported "compelling evidence that collectively, students in clinical placement generate

fewer medication errors if they have had prior exposure to a related, simulation-based experience" (para 11).

A connection between simulation based training and patient safety practices was established by Berkenstadt et al. (2008). Six to 8 weeks after implementing a simulation-based teamwork communication strategy, Berkenstadt et al. (2008) examined the effect of the intervention. They reported an increase in the incidence of nurses communicating crucial information during handoffs. While Bearnson and Wiker (2005) and Nehring (2008) examined the use of HPS as a substitute for clinical time in an acute care facility, several researchers investigated student and faculty satisfaction with simulation as a teaching tool (Bremner, Aduddell, Bennett, & VanGeest, 2006; Childs & Sepples, 2006; DeCarlo, Collingridge, Grant, & Ventre, 2008; King, Moseley, Hindenlang, & Kuritz, 2008). Other investigators used quasi-experimental pre/post-test designs to study skills performance of students using the HPS (Alinier et al., 2006; Hoffman et al., 2007; Kuiper, Heinrich, Mattias, Graham, & Bell-Kotwall, 2008).

A growing number of publications that advocate the use of simulation in nursing education and the social, behavioral and educational consequences of this new technology evolved in the nursing literature (Cato et al., 2009; Childs & Sepples, 2006; Dearman et al., 2001; Decker et al., 2008; Feingold et al., 2004; Goldenberg, Andrusyszyn, & Iwasiw, 2005; Horan, 2009; Medley & Horne, 2005; Nehring & Lashley, 2004; Rush, Dyches, Waldrop, & Davis, 2008; Scherer et al., 2007; Zsohar & Smith, 2006). Among the pivotal milestones were Jeffries and Rizzolo's (2006) National League for Nursing (NLN)/Laerdal Project Summary Report, which summarized a national multisite study on designing and implementing the use of simulation to teach

nursing care. Results of the study supported the use of high-fidelity patient simulators in providing active ways of learning, and providing opportunities for problem solving (Jeffries & Rizzolo, 2006).

Within the realm of medical and health education, several authors explored strategies for integrating simulator-based applications as adjunct to traditional teachings (Bremner et al., 2006; Bruce et al., 2009; Carroll & Messenger, 2008; Corbridge, Robinson, Tiffen, & Corbridge, 2010; Dayal et al., 2009; Gantt & Webb-Corbett, 2010; Owen, Mugford, Follows, & Plummer, 2006). Nehring and Lashley (2009a) compiled a chronological and comprehensive examination of many forms of simulation used in nursing education with a focus on the future of simulation in health care education. They gave a thorough overview of the issues plaguing simulation mingled with the highlights of the hopeful applications simulation has to offer. Nehring and Lashley (2009b) concluded that while the future of simulation in nursing is promising, the issues of student and faculty competencies in simulation remain ripe areas for future research.

Several researchers proposed that simulation, as opposed to other education and training methods, increased students' clinical skills. Those methods included standardized patients, traditional psychomotor skills laboratory sessions with task trainers, computer-based programs, and lecture classes (Alinier et al., 2006; Cioffi, Purcal, & Arundell, 2005; Clark, 2006; Curran, Aziz, O'Young, & Bessell, 2004; Feingold et al., 2004; Jamison, Hovancsek, Clochesy, & Bolton, 2006; Owen et al., 2006; Scherer et al., 2007). Findings of earlier studies generally agree with the notion of paucity of research correlating the use of simulation and self-efficacy. Leigh's (2008) review of the simulation literature yielded similar conclusions. Although there exists a

curious excitement about the use of simulation, the evidence to its effectiveness is lacking. Leigh's review revealed research is still needed to determine if participating in patient simulation improves self-efficacy and lead to safer and more efficient practitioners.

In an extensive and broad review that focused on the effectiveness of using high-fidelity patient simulators as an education tool for clinical skills and performance of simulation, Harder (2010) established that simulation, as opposed to other education and training methods, increased the students' clinical skills in the majority of the studies she reviewed. She further elaborated that students who engage in high fidelity simulation were also better able to manage scenarios, compared with groups that did not engage in a high-fidelity simulation. In a similar fashion, Sanford (2010) reviewed the simulation research from 2005 to 2009 and reported her disenchantment with the quality and lack of rigor of the simulation studies. She maintained that human simulation has found a place in nursing education; however, she stated "there is a void of concrete research in this area" (Sanford, 2010, p. 1010)

In addition to these reviews, the literature exposed a diversity of opinions on the use of simulation in nursing education in its many forms. Diverse investigators have analyzed didactic and clinical format with concentration on various elements of the simulated medium. Sleeper and Thompson (2008) highlighted communication as an essential component in providing therapeutic care in simulated psychiatric dimension, whereas Henneman and Cunningham (2005) presented evidence of integrating simulation as part of a critical care clinical course. The authors described the process they used to develop, implement, and evaluate high fidelity simulation experiences for senior nursing

students in a critical care elective. They concluded that simulation could be successfully integrated into an existing nursing course (Henneman & Cunningham, 2005).

Embedding simulation in nursing curricula was convincingly demonstrated by Starkweather and Kardong-Edgren (2008). Using the Diffusion of Innovation theory as a framework, the authors concluded that simulation could be successfully integrated into nursing curricula with the appropriate resources and supportive roadmaps (Starkweather & Kardong-Edgren, 2008). On the other hand, Lasater (2007) explored the use of simulation in developing clinical judgment in junior nursing students. In this qualitative study, Lasater provided insight into students' experiences and the implications for further investigation.

Faculty application of the Lasater Clinical Judgment Rubric (LCJR) was assessed by Dillard et al. (2009) in a collaborative effort to evaluate students' clinical judgment skills during clinical simulation. Faculty and students' perception transference from the simulation to the clinical setting were also assessed. From the quantitative and qualitative data collected from faculty and student evaluations and students' reflective statements, Dillard et al. (2009) reported conclusions to support the importance of simulation's contribution to clinical judgment development. They were cautious in acknowledging needed improvement in the integration of clinical judgment with the use of a conceptual framework and evidence-based rubric (Dillard et al., 2009).

In a rare investigation of student learning outcomes and simulation instruction, Elfrink, Kirkpatrick, Nininger, and Schubert (2010) presented an evaluation research focused on methods for improving simulation instruction. Using a pretest-posttest approach, NCLEX-style questions pertaining to the simulation content were administered

to nursing students from two pre-licensure nursing courses before the simulation, immediately following the simulation, and then again at their final examinations (Elfrink et al., 2010). The authors suggested that the findings have helped faculty determine the effectiveness of their simulation instruction. This study was one of the few investigations that evaluated student learning outcomes and simulation (Elfrink et al, 2010). A few studies that systematically examined the effect of simulator based instruction and traditional clinical teachings failed to demonstrate any differences between the two (Alinier, Hunt & Gordon, 2004; Clark, 2006; Gordon et al., 2006); however the studies lacked uniformity in assessing clinical performance.

Researchers using the traditional critical thinking tools to measure the concept in nursing students were limited. Using a pretest-posttest research design, Ravert (2008) administered the California Critical Thinking Disposition Inventory (CCTDI) and the California Critical Thinking Skills Test (CCTST) to two cohorts of 64 BSN students to assess critical thinking measures. Ravert explored whether measures of critical thinking showed differences between three groups (simulator, non-simulator, control) of baccalaureate nursing students. She reported that all three groups experienced a moderate to large effect size in critical thinking scores. Additionally, the moderating effect of students' preferred learning style did not corroborate any significant effect (Ravert, 2008).

Other researchers (Sullivan-Mann, Perron, & Fellner, 2009) have demonstrated that simulation can enhance the quality of nursing education by providing clinical experiences that increase critical thinking skills. They investigated 53 students from an associate degree nursing program using the Health Sciences Reasoning Test to determine

if critical thinking scores improved after exposure to multiple clinical simulation scenarios. Control participants received two simulation scenarios, and experimental participants received five scenarios (Sullivan-Mann et al., 2009). The experimental group showed a greater increase in critical thinking scores (Sullivan-Mann et al., 2009).

One of the challenges facing nursing education is the necessity to find meaningful and safe learning opportunities to prepare student nurses to function in an ever-increasing complex and technical clinical realm (NLN, 2003). This challenge underscores the importance of the proposed study to the field of nursing instruction as educators strive to prepare nurses to think critically and function with confidence. Because the critical skills of clinical confidence and critical thinking could be imparted via simulation (Horan, 2009), validating the impact of the human patient simulator on those critical skills could offer a vital educational strategic tool. As current use of simulation in nursing education increases, future research to establish its utility will decide how the technology will become embedded in nursing and healthcare education (Cannon-Diehl, 2009).

A gap is evident in the nursing literature concerning the impact of human patient simulation on baccalaureate junior nursing students' critical thinking and confidence skill. The lack of homogeneity in explicating outcomes of simulation teaching seemed evident throughout this review. Assumptions that can be extracted from the current research literature are that simulation technology has been determined to be a practical and successful vehicle to use in teaching a variety of skills, both psychomotor and clinical reasoning skills (Issenberg & Scalese, 2007). However, very few studies have assessed the outcomes of simulation use in nursing education objectively (Issenberg & Scalese, 2007). Equally apparent is the lack of uniformity in measurement tools to assess

the variable constructs under study. As increasing numbers of nursing programs acquire high fidelity simulators, additional research is needed to determine best practices with this teaching strategy (Sole & Guimond, 2010). Data are based on small and variable sample sizes, different instruments with questionable validity and reliability testing, measuring a variety of constructs.

This review of the literature on simulation and its advent in nursing education indicates that this teaching/learning modality may be a valuable asset to nursing education. The literature clearly calls for more innovation in nursing education (Bellack, 2008; Coonan, 2008; Dreher, 2008; Ironside & Valiga, 2007; Tanner, 2006b; Unterscheutz et al., 2008). What is also evident is the need for further exploration of simulation's impact on critical skills needed for safe clinical practice. Simulation technology demands for not only further study, but also the innovation requires a student-centered examination that is actively participative and conducted in a manner in which the constructs are defined clearly and measured objectively.

## Summary

This chapter included a review of the pertinent literature related to the use of simulation and its impact on critical thinking and self-confidence of nursing students. Constructivism as the theory that will serve as the theoretical framework for the study was presented and the dependent and independent variables were discussed. An abundant body of literature on the emergence of simulation in nursing education as a teaching modality (Cato et al., 2009; Childs & Sepples, 2006; Dearman et al., 2001; Decker et al., 2008; Feingold et al., 2004; Goldenberg et al., 2005; Horan, 2009) and the gaps identified in this chapter provide the background for evaluating human patient

simulation's (HPS) impact on junior student nurses' critical thinking and confidence skills. In Chapter Three, a quasi-experimental methodology, with a pretest- posttest design will be discussed. The instrumentation, procedures for conducting the study, and processes for presenting the data will also be described in Chapter Three.

# CHAPTER THREE: METHODOLOGY

## Introduction

For the baccalaureate nursing graduate core quality and safety competencies are considered basic skills needed to meet essential curricular objectives (AACN, 2008). Traditionally, hospital clinical experiences were the primary approaches used to acquire and cultivate those critical skills (Forbes & Hickey, 2009). Clinical simulation offers a clear opportunity to augment clinical practices with simulated patients as an adjunct to working with live patients (Jarzemsky et al., 2010). Educational research in nursing to study newer, non-traditional pedagogies, such active learning strategies, and their effects on student learning is lacking (Brown, Kirkpatrick, Mangum & Avery, 2008). If the research supports the use of simulation as comparatively effective as that of traditional clinical in fostering confidence and critical thinking in graduate nurses, then simulation's use in nursing education would be justified.

The purpose of this chapter is to describe the research design, including considerations to the possible threats to the internal and external validities of this study. The research questions, sampling concepts, diagnostic instruments, study procedures, and data analysis are also described. The purpose of this study was to evaluate the use of human patient simulation's (HPS) impact on junior nursing students' critical thinking and self-confidence skills. The following research questions served to guide the study:

Research Question 1: What effect does the use of human patient simulation have on junior nursing students' critical thinking skills?

Research Question 2: What effect does the use of human patient simulation have on junior nursing students' clinical confidence skills?

Research Question 3: Is there a correlation between junior nursing students' critical thinking skills and confidence scores?

**Hypotheses**

$H_0$1 – Human patient simulation has no significant effect on junior nursing students' critical thinking skills.

$H_0$2 – Human patient simulation has no significant effect on junior nursing students' confidence skills.

$H_0$3 – There is no significant correlation between junior nursing students' critical thinking and confidence skills.

These hypotheses were tested at a 0.05 significance level.

## Research Design

The research design, the blueprint for conducting the study, maximizes control over factors that could interfere with the validity of the findings (Burns & Grove, 2007). This study used a quasi-experimental between group pretest and post-test design. The purpose of a quasi-experimental research is to examine causal relationships or to determine the effect of one variable on another (Burns & Grove, 2007). Quasi-experimental studies involve introducing a treatment and examining the effects of the treatment using specific measurement methods (Marczyk, DeMatteo, & Festinger, 2005). Whereas a quasi-experimental design has the advantage of utilizing existing groups in educational settings, it introduces several threats that need to be addressed (Creswell, 2008). Following are the descriptions of the design, measurement, sample, data collection, statistical analysis, threats, and weaknesses of the study.

**Quantitative Research**

In quantitative research the investigator decides what to study; asks specific, narrow questions; collects numeric data; analyzes these numbers using statistics; and conducts the study in an unbiased manner (Creswell, 2008). As noted by Mills (2003), quantitative research is the study of problems "requiring a description of trends or an explanation of relationship among variables" (p. 33). To evaluate the outcomes of an educational intervention such as clinical simulation, a quasi-experimental quantitative design may help explain the relationship among simulation and critical thinking and self-confidence of junior nursing students. In the study, the investigator explored the effect of the independent variable (simulation) on the dependent variables critical thinking and self-confidence of junior nursing students. Although qualitative research is used to explore and understand phenomenon (Mills, 2003), a quantitative approach is suitable for the proposed inquiry because the research questions can be investigated using tools that quantify the variables being studied. Therefore, the design in quantitative research becomes the vehicle for hypothesis testing and answering research questions (LoBiondo-Wood & Haber, 2006).

Using a quantitative approach requires a formal, objective, rigorous, and systematic process whereby "the researcher's values, feelings and personal perceptions cannot enter into the measurement of reality" (Burns & Grove, 2005, p. 23). Striving for rigor in the process demands discipline, adherence to detail, and strict accuracy (Burns & Grove, 2007). The quantitative approach imposes rules and disciplined procedures designed to control the research situation, minimize bias, and maximize validity (Polit & Beck, 2010).

This study utilized a quasi-experimental between group pretest and posttest design to test cause and effect relationships of the variables of interest in this study. In the pretest/posttest design, the dependent variable is measured both before and after the intervention. This design has the advantage of establishing a temporal precedence of the independent variable to the dependent variable (Marczyk et al., 2005). Two group pre- and posttest design helped to provide insight into the relationship between critical thinking and self-confidence skills of baccalaureate junior nursing students after exposure to clinical simulation. Marczyk et al. (2005) suggested that the use of a pretest allows the researcher to measure between-group differences before exposure to the intervention and could substantially reduce the threat of selection bias by revealing if the groups differed on the dependent variable prior to the intervention.

**Design Validity**

Four types of validity exist in quantitative research design: statistical conclusion, internal validity, construct validity, and external validity (Shadish, Cook, & Campbell, 2002). Threats to these validities may jeopardize the study so that the conclusions reached provide a false reading about probable cause and effect between the treatment and the outcome (Creswell, 2008). The researcher must therefore consider these threats and minimize them.

**Statistical Conclusion**

Threats to statistical conclusion validity occur when poor choices are made in the selection of statistics to use in the data analysis (Vogt, 2007). These statistical analyses may result in incorrect deductions and misleading inferences and yield errors in concluding research findings. Polit and Beck (2010) described two types of errors

researchers construct when making incorrect conclusions. First, a Type I error—a false positive—occurs when the researcher concludes there is a difference between the groups studied when, in fact, there is no difference (Polit & Beck, 2010). Second, a Type II error —a false negative—emerges when the researcher concludes there is no difference between the groups being studied when, in fact, there is a difference (Polit & Beck, 2010). The risk of making a Type II error in this study was more likely because of the small sample size, the level of significance of .05, and the diagnostic measurement tools. Burns and Grove (2007) ascribe this inherent flaw in making a Type II error when researchers reach erroneous decisions from their statistical analysis.

**Internal Validity**

Internal validity of a research study is the extent to which its design and the data it yields permit drawing accurate conclusions about cause-and-effect and other relationships (Leedy & Ormrod, 2010). The most commonly encountered threats to internal validity are history, maturation, instrumentation, testing, statistical regression, selection biases, and attrition (Vogt, 2007). Testing, maturation, and history may be significant threats to the internal validity of this study. The students were exposed twice to the measuring tests of confidence and critical thinking. Taking the tests repeatedly creates the opportunity for memorization or familiarization of the contents of the diagnostic instruments (Marczyk et al., 2005). In this study, the threat of testing was minimized because the self-report measurements were only taken once.

Attrition was another threat considered. Students may not be able to continue with the study because of various uncontrollable reasons typical to the educational experience. Burns and Grove (2007) acknowledge that a loss of subjects prior to the end

of the study may have an impact on the findings. Attrition could cause observed disparities in outcomes to be questioned because the differences could be attributed to individual divergence in the group rather than by the intervention itself (Polit & Beck, 2010). Threats of maturation and selection were minimized by selecting participants in the same cohort who were exposed to similar clinical experiences except for the treatment of simulation in the experimental group. The threat of history was minimized by keeping the intervals from pre- to posttesting to a minimum of 5 weeks.

**Construct Validity**

Statistics and practical procedures are used to construct validity, which is the extent to which the practical components of a test relate to an underlying psychological construct (Salkind, 2003). Threats to construct validity are associated with the researcher's selection of instrument to measure the variables under study (Burns & Grove, 2007). In this study, two primary instruments were used to quantify the students' critical thinking and confidence skills: Facione and Facione's California Critical Thinking Skills Test (CCTST) and Grundy's Confidence Scale (CS). These two instruments were selected because they may measure the variables being studied.

To minimize the threat of inadequate preoperational explication of constructs, the concepts of critical thinking and confidence have been defined to establish a clear explanation of the variables being measured. The threat of hypothesis guessing whereby participants try to figure out what the study is designed to prove (Cook & Campbell, 1979) can also impact the construct validity of this study. Students involved in the study may not provide accurate responses to the diagnostic instruments. To avoid such a threat, students were advised of the security and confidentiality of their responses.

**External Validity**

The external validity of a research study is the extent to which the conclusions drawn can be generalized to other contexts (Leedy & Ormond, 2010). Threats to external validity affect the generalization or the ability to draw correct inferences from the sample data to other persons, and settings (Cook & Campbell, 1979). This study was limited to a convenience sample of junior nursing students at a proprietary college of nursing in south Florida in the third quarter of their nursing education. The results attained may not be readily generalized to any other group unless the study is replicated in other populations with similar characteristics of the sample studied in this investigation.

## Sampling Concepts

Convenience sampling as defined by Creswell (2008) is " a nonprobability method of selecting subjects who are accessible or available" (p. 274). The subjects for this study were selected using nonprobability-sampling techniques whereby the sample is chosen by nonrandom methods (Macnee, 2004). With this method of sampling, the likelihood of producing representative samples is diminished and the generalizability of the findings is limited to similar settings (Polit & Beck, 2010). The target population participating in this study was a non-probability convenience sample enrolled in a nursing course titled Caring for Adults I. A convenience sample of third-quarter junior baccalaureate nursing students was assigned to two groups utilizing intact group assignment. This procedure was used to minimize disruptions to the learning environment. Creswell (2008) explained that studies with convenience samples are useful for documenting that a particular characteristic or phenomenon occurs within a given group and for detecting relationships among different phenomena. Although the

primary purpose of the research may not be to generalize but to understand better relationships that may exist, methodical bias must be considered because of the size of the non-random sample.

**Sample Size**

The subjects, composed of 26 (N=26) baccalaureate junior nursing students, are identified as Cohort 16. They were invited to participate in the study formally in a letter describing the research (Appendix E). The sample size should be determined when selecting the participants for the study and be based on the statistical procedures of the research design (Creswell, 2008). Statistical conclusion validity may be threatened when samples are too small; however, when expected differences are large, it is not necessary to have a large sample to ensure that the differences will be revealed in a statistical analysis (Polit & Beck, 2010).

In this study, the available 26 students in this convenience sample were placed in two groups based on their clinical simulation rotation. They were labeled as Group 1 and Group 2. The groups were matched to eliminate known sources of bias; however, potential bias from hidden sources still remained (Creswell, 2008). Group 1 participated in clinical practice with simulation, and Group 2 participated in clinical practice only. Group 1 participants using simulation were expected to perform appropriate nursing actions consisting of assessing the simulated patient, determining the correct interventions, and administering medications though the correct routes. Both groups were expected to participate in clinical practice at an acute care facility for a 5-week period. Group 1 participants were also expected to evaluate their actions by a debriefing

session with video playback. This sampling process and study design is congruent with the sample size used for this research.

**Sample Setting**

This research was conducted at a moderately sized proprietary College of Nursing (CON) in south Florida. The Bachelor of Science in Nursing (BSN) program is designed to provide students with an educational foundation that prepares them for entry into the nursing profession. The community is racially diverse, and the student body reflects that diversity. The nursing curriculum is divided into seven quarters; each quarter consists of 10 weeks. Since opening in 2000, the College of Nursing has admitted 17 cohorts of student nurses and has graduated a total of 358 future nurses. This setting was chosen because of the convenience sample and the necessity to capture the perspectives of the population who are actively adopting the teaching strategies described in the study. Additionally, the evidence for using the technology of simulation in this setting needs to be corroborated with relevant research.

**Sample Survey**

The student body is racially diverse, multicultural, and 95% female. This mix of student gender, race, and nationality is reflective of the national demographics in nursing education (National Sample Survey of Registered Nurses, 2008). Inclusion criteria for the study included 26 third-quarter junior baccalaureate-nursing students enrolled in the clinical course Caring for Adults I. A survey composed of questions such as age, gender, cultural background, marital status, and work experience yielded demographics data to describe this convenience sample (Appendix F). As part of their clinical practice, students in the Caring for Adults I Practice course provide care for adult patients

experiencing cardiovascular, pulmonary, gastrointestinal, endocrine, cancer, and immunological disorders. The emphasis is placed on nursing roles used to meet the needs of ill adults and their families.

## Instrumentation

Measurement is defined as a process through which "researchers describe, explain, and predict the phenomena and constructs of daily existence" (Marczyk et al., 2005, p. 95). Measurement enables the quantification of abstract constructs to measure the behavior being studied (Neutens & Rubinson, 2010). When selecting a diagnostic tool, it must be inspected with scrutiny toward authenticity because the measuring instrument will influence the findings of the research (LoBiondo-Wood & Haber, 2006). In this study, two primary instruments were used to quantify the students' critical thinking and confidence skills, the California Critical Thinking Skills Test (CCTST) and Grundy's Confidence Scale (CS). In addition, a student survey developed by the researcher aggregated demographics data from the subjects being studied.

### California Critical Thinking Skills Test

The Facione and Facione's California Critical Thinking Skills Test (CCTST) was used to assess critical thinking skills of the junior nursing students. Critical thinking is defined by the Delphi experts as "purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based" (Facione, 1990, para. 4). Based on that definition of critical thinking, the CCTST is designed specifically to assess core critical thinking skills essential to persons in college education programs (Insight Assessments, 2010). A 34-item multiple-

choice test, the CCTST is available in three forms (A, B, and 2000). The test contains five subscales and can be administered via paper-and-pencil or an Internet connection in a 45-minute setting (Insight Assessments, 2010). The first three sub-scales are analysis, inference, and evaluation. The fourth and fifth sub-scales represent a characterization of reasoning as either inductive or deductive (Lambert, 2008). Form A of the CCTST was used for this study.

**Reliability and Validity**

According to Lambert (2008), content, construct, and criterion validity measures were used to assess the validity of the CCTST. Facione and Facione (1990) acknowledged that each of the items was judiciously selected for its theoretical relationship to the Delphi group's construct of critical thinking. Lambert (2008) confirmed that content validity was established from a pool previously analyzed for their ability to discriminate well between individuals in terms of critical thinking skills and by high inter-item correlations. Kuder-Richardson 20 coefficients are presented as measures of internal consistency of the CCTST. Kuder-Richardson 20 (KR-20) is a measure of internal consistency reliability for measures with dichotomous choices (Streiner, 2003). The Kuder-Richardson is comparable to Cronbach's α whereas alpha applies to any set of items regardless of the response scale (Streiner, 2003). A high KR-20 coefficient (e.g., >0.90) indicates a homogeneous test (Streiner, 2003).

Three groups produced coefficients of .68, .69, and .70 for Form A (Lambert, 2008). In two groups, Form B showed KR-20 coefficients of .71 and .75. Form 2000 generated coefficients of .78 and .80 in two additional groups studied (Lambert, 2008).

For a separate group of graduate nursing students who completed Form B, the Kuder Richardson 20 estimate was .75. Alternate form reliability between Form A and Form B was .78 for students who took both forms. Thus, Lambert (2008) concluded that the CCTST has demonstrated adequate internal consistency and alternate form reliability. Significant correlations ranged from .20 for college grade point average to .72 for Graduate Record Examination total score (Lambert, 2008).

Various studies using the CCTST attested to its utility, reliability, and validity in assessing the construct of critical thinking in academic settings (Denial, 2008; Sorensen & Yankech, 2008; Spelic et al., 2001). The tool was chosen for its specificity to the population being studied and its reported validity and reliability to measure the variable of critical thinking

**Confidence Scale**

Grundy's (1993) Confidence Scale (CS) was used to measure the confidence levels of the baccalaureate junior nursing students' ability to perform a holistic physical assessment on patients they care for during their simulation and clinical experience. Grundy (1993) explained the importance of confidence in performing a physical assessment as an integral aspect of the nursing process. She stated that confidence is fundamentally intrinsic in developing basic skills for patient care decisions. To prepare new nurses to function in their professional roles, confidence in their assessment skills must be a core competency educators foster in students prior to their entry into professional practice (American Nurses Association [ANA], 2004).

**Reliability and Validity**

Developing confidence is an important component of clinical nursing practice (Grundy, 1993). She further asserted that the Confidence Scale offers a valid and reliable tool to study the phenomenon. Polit and Beck (2010) declare that a quantitative instruments' validity is an important criterion for instrumentation evaluation. The CS is composed of five performance statements on a 5-point Likert-type scale assessing the self-efficacy of clinical competence of the participants' assessment skills. Its validity was determined by a group of nursing experts (Hayes, 1998).

Instrument reliability refers to the consistency of measurement, or the extent to which the scores are similar over different forms of the same instrument (McMillan & Schumacher, 2006). The Cronbach's alpha of the CS conducted on nursing students post-test correlation coefficients ranged from 0.84 to 0.89 with report of high reliabilities and internal consistency of 0.84 (Grundy, 1993). Cronbach's alpha is a correlational measure of the reliability or consistency of the items in a scale. Cronbach's alpha ranges from 0 to 1.0. The usual cutoff point for a reliable scale is .70 or higher (Vogt, 2007). Several published articles and studies have corroborated the reliability and validity of Grundy's Confidence Scale for nursing students as well as nurse practitioners (Hayes, 1998; Roslien & Alcock, 2009; Seldomridge, 1997).

## Ethical Considerations

Prior to gathering data and in compliance with the guidelines of the Institutional Review Boards at Argosy University, written consent was obtained from individuals who agreed to participate in the study. As stated in the Argosy University (AU) Institutional Review Board guidelines (2008), "Every investigator at Argosy University must obtain

the informed consent of any potential human participant of research before involving that person in the research itself" (p. 18). Permission was requested formally in a letter that described the purpose of the study, the amount of time needed to collect data, the time required of participants, and how the data and results will be used. The letter also informed the participants that their participation is voluntary and that they have the right to withdraw at any time from the study without penalty or negative consequences of any kind. The participants were accessed through the nursing department chair with written permission. As the gatekeeper to the nursing students, the department chair was acquainted with this research proposal informally and formally in writing.

The following measures were taken to ensure that the human subjects who volunteered to participate in this study were protected:

1. Written permission was obtained from the Dean of Academic Affairs and the Chair and Dean of the Nursing Program to obtain permission to engage the junior students as subjects in this study (Appendix A).
2. Permission for using the Confidence Scale in this study was obtained from Dr Susan Grundy (Appendix B).
3. Permission for using the California Critical Thinking Skills Test (CCTST) was obtained from Insight Assessment (Appendix C).
4. Permission was obtained from the Institutional Review Board of Argosy University prior to conducting any data collection (Appendix D).
5. A cover letter to explain the confidentiality and voluntary nature of the study was distributed to the participants and a consent form to participate was also obtained (Appendix E).

## Assumptions

Assumptions are beliefs held to be true but have not necessarily been proven (Nieswiadomy, 2008). For this study, the following assumptions were:

1. Students would respond honestly to the questions posed in the measuring instruments.
2. Simulated experiences influence students' critical thinking and confidence skills.
3. The investigator would maintain an objective deportment throughout the conduct of the research.

## Procedures

Statistical procedures are used to test the relationship between two or more variables and to determine if an observed statistical effect is a true reflection of a causal relationship (Creswell, 2008). Sample technique, methodological steps, instruments used for data collection and analysis techniques are the essential procedures the researcher uses to describe, summarize, and interpret the study's data (Neutens & Rubinson, 2010). In this study, the following procedures were used to collect the data:

1. Arrangements were made with the course facilitator for a specific date and time to address the junior nursing students regarding the purpose of the study.
2. The investigator delivered and distributed the consent forms to the junior nursing students enrolled in the Caring for Adults I Practice course.
3. All junior nursing students in Cohort 16 were asked to participate in this study and were also given the option to refuse if they so desire.
4. A cover letter was distributed first, followed by the consent form.

5. The students were given time to read and sign the consent forms which were placed in an envelope.
6. Students who had consented to participate in the research study were asked to complete a demographics survey. The survey was used to graph the participants' demographics, such as age, gender, cultural background, marital status, and work experience.
7. The diagnostic instruments were administered and collected by Dr. France, the coordinator for the course Research in Nursing Practice.

The Caring for Adults I Practice course focuses on caring for persons with cardiovascular, pulmonary, gastrointestinal, endocrine, cancer, and immunological conditions (South University Catalog, 2010). Students enrolled in the course are expected to meet course objectives that include the identification of patient problems based on holistic health care assessments and the application of critical thinking to provide care to persons with health issues. The course is offered during the third quarter of the nursing program curriculum.

The Simulation clinical course is a student-focused learning experience that supports successful transition of clinical learning by beginners and advanced practitioners. National League of Nursing (NLN) and American Heart Association (AHA) clinically accurate simulations are used to provide students the opportunity to assess common patient problems and implement appropriate interventions. Students enrolled in Caring for Adults I practice course participate in a 6-hour clinical simulation experience where the focus is on three patients' case scenarios. The case scenarios include a focused assessment of a patient with angina, one with congestive heart failure,

and a patient with myocardial infarction requiring cardiopulmonary resuscitation. After the simulation experience, students participate in a debriefing session that provides them with immediate feedback and a reflective critical thinking analysis of the simulation session.

The 26 students in this convenience sample were placed in two groups: Group 1 and Group 2. The groups were matched to eliminate known sources of bias; however, potential bias from hidden sources may still remain (Creswell, 2008). Group 1 participated in clinical practice with clinical simulation, but Group 2 participated in clinical practice only. Group 1 participants were expected to perform appropriate nursing actions consisting of assessing the simulated patient, determining the correct interventions, and administering medications though the correct routes. Group 1 participants were also expected to evaluate their actions by a reflective debriefing session with video playback.

## Data Processing and Analysis

The data collection methods were used to obtain information that answer the research questions and measures the parameters being studied. Two validated instruments were used to collect quantitative data: the California Critical Thinking Skills Test (CCTST) and Grundy's Confidence Scale. A student survey describing the demographic attributes of the subjects were used to collect data to describe the sample in terms of age, gender, cultural background, marital status, and work experience.

At the beginning of the third quarter, prior to any simulation experiences, all participants were assessed for critical thinking skills and confidence by using Grundy's Confidence Scale and California Critical Thinking Skills Test. The scores from the

Grundy's CS were tabulated and recorded in a secure password- protected database for future analysis. Under strict security procedures, the CCTST score sheets were tabulated and mailed to Insight Assessments for scoring. After the pretest has been administered, Group 1 had 5 weeks of clinical experience at an acute care facility plus one 6-hour session of clinical simulation. Group 2 had 5 weeks of clinical experience at the acute care facility and no simulation.

For the clinical simulations, the students were exposed to three National League of Nursing clinically accurate situations that mirror common patient problems that reflect the Joint Commission of Hospital accreditation patient safety standards. After those 5 weeks of clinical experience and simulation, both groups were reassessed by re-administering Grundy's CS and the CCTST. The CCTST post-treatment response sheets were sent to Insight Assessments for scoring, and the CS data were tabulated for comparison to the pre-treatment scores.

Upon receipt of the critical scores from Insight Assessments, the quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS) program to compare the two groups. The data was analyzed with a non-parametric independent samples Mann-Whitney U test. Marczyk et al. 2005 suggested that the analysis of covariance or ANCOVA is a statistical approach that can minimize the impact of extraneous variables. Creswell (2008) elaborated that the ANCOVA adjusts for participants' scores so that they are equalized on the measured variable of interest. In other words, this statistical technique controls for individual differences and adjusts for those differences among nonequivalent groups (Marczyk et al., 2005). The collected data from the sample did not meet assumptions of homogeneity; therefore the desired

ANCOVA analysis was replaced with an appropriate test of analysis. After analyzing the data from the student survey, both the survey and the signed consent forms will be kept in a locked file for 3 years and destroyed unopened. The completed diagnostic instruments used in this study, the CCTST and CS collected by the investigator will be placed in an envelope and stored in a locked file drawer when not being used for data analysis. After 3 years, all instruments will be destroyed.

Pretests may affect aspects of the experiment by sensitizing the experimental group to the treatment; therefore they are often statistically controlled by using the procedure of covariance rather than by simply comparing them with post-test scores (Marczyk et al., 2005). In most cases of a pretest/posttest design, the ANCOVA would be a more appropriate analysis in providing a more powerful test of the hypothesis that will be measured because the pretest serves as a true co-variate (Duggard & Todman, 1995).

To answer the third research question, a Pearson correlation was used to analyze if a correlation existed between the students pre and post confidence and critical thinking skills. "A correlation is a statistical test to determine the tendency or pattern for two or more variables to vary consistently" (Creswell, 2008, p. 356). Descriptive statistics was used to present the demographic representation of the participants.

## Limitations

One limitation of this study design is that participants in both groups attend classes and clinical experiences together; therefore, contamination between the groups may occur. To minimize the inability to draw suitable conclusions from the research, the following threats to internal validity were controlled. Threats of maturation and selection

were minimized by carefully selecting participants in the same cohort who were exposed to similar clinical experiences except for the treatment of simulation in Group 1. The threat of history was minimized by keeping the intervals from pre- to posttesting to a minimum of 5 weeks.

## Delimitations

This study focused on a sample of junior nursing students at a moderately sized college of nursing in south Florida. The convenience of access and the small sample size in a limited geographical area are presented as delimitations of the study. The convenient sample from this specific college of nursing may not be representative of most nursing students. Those characteristics limit the scope and the generalizability of this research study's findings.

## Summary

Chapter Three included the quantitative methodological approach that is used to support or refute the null hypotheses presented in this study. The research design, the reliability and validity of the diagnostic instruments, and the sampling concepts were explored. The procedures, data collection, and analysis process to help investigate the null hypotheses were explained in this chapter. Chapter Four will describe the data analysis of the research findings of the impact of simulation use on junior nursing students' critical thinking and confidence skills.

# CHAPTER FOUR: FINDINGS

## The Purpose

The purpose of this study was to evaluate the impact of human patient simulation (HPS) on junior student nurses' critical thinking and confidence skills. The following questions were posed to direct the study:

Research Question 1: What effect does the use of human patient simulations have on junior nursing students' critical thinking skills?

Research Question 2: What effect does the use of human patient simulation have on junior nursing students' clinical confidence skills?

Research Question 3: Is there a correlation between junior nursing students' critical thinking skills and confidence scores?

The subsequent null hypotheses were formulated to address the stated purpose.

$H_0$1 – Human patient simulation has no significant effect on junior nursing students' critical thinking skills.

$H_0$2 – Human patient simulation has no significant effect on junior nursing students' confidence skills.

$H_0$3 – There is no significant correlation between junior nursing students' critical thinking and confidence skills.

These hypotheses tested at a 0.05 significance level.

To answer the three research questions, two diagnostic tools, the CS and the CCTST, were administered to a cohort of junior nursing students registered in their first medical surgical nursing course, Caring for Adults 1. The findings are presented, following a description of the sample.

## Description of the Sample

After receiving approval from Argosy's Institutional Review Board, a convenience sample of third-quarter junior baccalaureate nursing students was invited to participate in this study. Twenty-eight students consented to partake in the study; however, only 26 returned to proceed with the administration of the CS and the CCTST. Most of the members in this cohort belong in the 23 to 26 age group and possessed a variety of clinical experiences ranging from practical nursing, patient care assistant to physical therapist. A few noted they had no clinical experience. Out of the 26 participants, the majority are married or partnered, and employed. These students were enrolled in the class Caring for Adults I Practice, which is their first medical surgical nursing clinical course. The group's demographics, listed in Table 1, are reflective of those in nursing education (National League for Nursing, 2009).

Table 1

*Participants' Characteristics*

| Characteristics | Number | Percentage |
|---|---|---|
| *Cultural Background* | | |
| Black/African American | 11 | 42.0 |
| Caucasian | 9 | 35.0 |
| Hispanic | 3 | 11.0 |
| Asian | 2 | 8.0 |
| Native American | 1 | 4.0 |
| *Total* | 26 | 100.0 |

*(continued)*

Table 1 *(continued)*

| Characteristics | Number | Percentage |
|---|---|---|
| *Gender* | | |
| Male | 4 | 15.0 |
| Female | 22 | 85.0 |
| *Total* | 26 | 100.0 |
| *Marital Status* | | |
| Single | 11 | 42.0 |
| Married/Partnered | 12 | 46.0 |
| Divorced | 2 | 8.0 |
| Widowed | 0 | 0 |
| Other/Separated | 1 | 4.0 |
| *Total* | 26 | 100.0 |
| *Age Group* | | |
| 18-22 | 1 | 4.0 |
| 23-26 | 7 | 27.0 |
| 27-30 | 6 | 23.0 |
| 31-30 | 5 | 19.2 |
| 36-40 | 4 | 15.3 |
| 41+ | 3 | 11.5 |
| *Total* | 26 | 100.0 |
| *Employment Status* | | |
| Employed | 14 | 54.0 |
| Non-employed | 12 | 46.0 |
| *Total* | 26 | 100.0 |

*(continued)*

Table 1 *(continued)*

| Characteristics | Number | Percentage |
|---|---|---|
| *Clinical Experience* | | |
| Patient Care Assistant | 6 | 23.0 |
| License Practical Nurse | 3 | 11.0 |
| No Clinical Experience | 8 | 31.0 |
| Other [medical field related] | 9 | 35.0 |
| *Total* | 26 | 100.0 |

*Note.* Group characteristics reflect national nursing school norms.

**Course Description**

The Caring for Adults I Practice course focuses on caring for persons with cardiovascular, pulmonary, gastrointestinal, endocrine, cancer, and immunological conditions (South University Catalog, 2010). Students enrolled in the course are expected to meet course objectives that include the identification of patient problems based on holistic health care assessments and the application of critical thinking to provide care to persons with health issues. The course is offered during the third quarter of the nursing program curriculum.

The Simulation clinical course is a student-focused learning experience that supports successful transition of clinical learning by beginners and advanced practitioners. National League of Nursing (NLN) and American Heart Association (AHA) clinically accurate simulations are used to provide students with the opportunity to assess common patient problems and implement appropriate interventions. Students enrolled in Caring for Adults I practice course participate in a 6-hour clinical simulation experience where the focus is on three patients' case scenarios. The case scenarios include a focused assessment of a patient with angina, a patient in congestive heart

failure, and a patient with myocardial infarction requiring cardiopulmonary resuscitation. After the simulation experience, students participated in a debriefing session that provided them with immediate feedback and a reflective critical thinking analysis of the simulation session.

Group 1 participated in five clinical sessions on a telemetry unit at their clinical site with a clinical instructor for 5 weeks. During those 5 weeks, students in Group 1 also attended a simulation session at the clinical simulation lab with the simulation instructor. The 6-hour clinical simulation experience consisted of three parts: (a) an initial introduction where the students received reports on the patient diagnosis, history, doctors' orders, laboratory values and medications; (b) discussion of a plan of care to include nursing diagnoses, interventions, and possible complications; and (c) scenario performances. During the scenario performance, students worked in teams of five members. As teammates, they partnered to perform full and focused physical assessments on the simulated patient (HPS), carry out doctors' orders, and perform necessary procedures such as intravenous, nasogastric, and urethral catheter insertions. Based on their assessments and available resources, the students managed the simulated patient using interventions they deemed appropriate to treat the patients' conditions. At the completion of the scenario, the students were debriefed and received feedback on their performances.

## Study Design

The two group/control group experimental design was used to provide the control needed to explore the cause and effect of the variables in this study (see Table 2). This quasi-experimental quantitative design may help explain the relationship among

simulation and critical thinking and self-confidence of junior nursing students. Both groups were pretested, and both were posttested, the difference being that Group 1 was administered the simulation treatment.

Table 2

*Two Group/Control Group Experimental Design*

| Group | Pretest | Treatment | Posttest |
|---|---|---|---|
| Group 1 | X | Y | X |
| Group 2 | X | | X |

*Note.* Group 1= Junior nursing students with simulation; Group 2=Junior nursing students without simulation. X= CCTST and CS, Y= Simulation.

The pretests were administered to both groups prior to clinical practice. After five weeks of clinical practice, both groups received the post-tests. The only difference between the groups is that Group 1 received six hours of clinical simulation.

## Data Analysis

The data analysis was performed using IBM ® SPSS ® Statistics version 19.0. The CCTST were collected and mailed to Insight Assessment for analysis of the critical thinking components. Within one week of receiving the CCTST forms, Insight Assessment reported their results, which were then entered into SPSS by the researcher. The primary investigator tabulated and analyzed the CS scores, which consist of five category items, 5-point Likert scale response format to sum a single score of 25. Dr. France, the coordinator of the Research in nursing course, proctored the administration of the diagnostic instruments.

**Critical Thinking Skills**

At the beginning of the third quarter, April 2011, the California Critical Thinking Skills Test version 00.2.10 and Grundy's Confidence Scale were administered as pre-tests to 26 (*N*=26) student nurses who had consented to participate in the study. After 5 weeks of clinical education at the hospital and at the simulation lab, the students were posttested with the same instruments in May 2011. Of the original 26, only 22 students (*N*=22) completed the CCTST and the CS post-intervention. For the purpose of this research, 22 (*N*=22) participants are considered for the analysis of the data since they completed both pre- and posttest of the measuring instruments.

The first null hypothesis was tested using non-parametric independent-samples to determine if there were any difference between the distribution of critical thinking pre-test and posttest scores of the participants at the .05 level of significance. The collected data from this sample did not meet assumptions of homogeneity necessary to evaluate the covariates; therefore, the proposed ANCOVA analysis was replaced with a more appropriate test of analysis. Deviations from assumptions of normalcy in the distributions of means in the study's small sample prompted the use of non-parametric analyses. Table 3 depicts the statistics for the CCTST scores.

Table 3

*California Critical Thinking Skills Test Scores Statistics*

| Test | Students | *n* | *M* | *SD* |
|---|---|---|---|---|
| CT-pre | Group 1 | 10 | 14.20 | 3.584 |
| | Group 2 | 12 | 12.00 | 5.576 |
| CT-post | Group 1 | 10 | 14.60 | 3.239 |
| | Group 2 | 12 | 12.67 | 5.821 |

*Note*. The group statistics showed that Group 1's mean scores were higher than Group 2's mean scores before and after the treatment.

To determine if human patient simulation has a significant effect on junior nursing students' critical thinking skills, the following null hypothesis was formulated: $H_0$: μgroup1 = μ group 2. Using a non-parametric independent samples Mann-Whitney U test, the distribution of critical thinking scores of the junior nursing students were compared pre- and posttest. The test summaries revealed that the distribution of the scores were the same across categories both pre- and posttest. The distribution of critical thinking scores is the same across categories of junior students using the Independent Samples Mann-Whitney U test at a significance level of .083 > .05 (pretest) and at a significance level of .228 >.05 (posttest). Therefore the null hypothesis was retained. The results suggest that human patient simulation has no significant effect on junior nursing students' critical thinking skills.

**Confidence Skills**

The second null hypothesis was tested using non-parametric independent-samples test to determine if there were any differences between the distribution of confidence pre-

test and posttest scores of the participants at the .05 level of significance. Table 4 depicts the group's confidence scores statistics.

Table 4

*Group Confidence Scores Statistics*

| Test | Students | *n* | *M* | *SD* |
|---|---|---|---|---|
| CS-pre | Group 1 | 10 | 20.20 | 2.821 |
| | Group 2 | 12 | 18.67 | 3.025 |
| CS-post | Group 1 | 10 | 19.20 | 2.974 |
| | Group 2 | 12 | 18.00 | 2.486 |

*Note*. The group statistics showed that Group 1's mean scores were higher than Group 2's mean scores pre- and posttest. Both groups pretest mean scores were higher than their posttest mean scores.

To determine if human patient simulation has a significant effect on junior nursing students' confidence skills, the following null hypothesis was formulated: $H_0$: μgroup1 = μ group 2. Using a non-parametric independent samples Mann-Whitney U test, the distribution of confidence scores of the junior nursing students were compared pre- and post test. The test summaries revealed that the distribution of the scores were the same across categories both pre- and posttest. The distribution of confidence scores is the same across categories of junior students using the Independent Samples Mann-Whitney U test at a significance level of .217 > .05 (pretest) and at a significance level of .201 >.05 (posttest). Therefore the null hypothesis was retained. The results suggest that human patient simulation has no significant effect on junior nursing students' confidence skills.

**Correlation Between Critical Thinking and Confidence Skills**

The third research question sought to explore whether or not there was a correlation between junior nursing students' critical thinking skills and confidence scores. The notation for the hypothesis of the correlation to be tested is $H_0$: $r = 0$ and H1: $r \neq 0$. A Pearson correlation procedure was used to determine if a relationship existed between the two variables. Of the 22 ($N$=22) students tested prior to simulation, the confidence scores yielded ($M$=19.36, $SD$ =2.9) and ($M$=13, $SD$ = 4.8) for critical thinking skills scores. After the simulation experience, the confidence scores had ($M$= 18.55, $SD$= 2.7) and critical thinking skills revealed ($M$= 13.5, $SD$ = 4.8).

A Pearson $r$ data analysis shows no correlation ($r$ = - .027, $p$=. 45) between the two variables prior to simulation. In the posttest data, the Pearson $r$ shows a moderate correlation of ($r$=. 412, $p$= .02) between confidence and critical thinking skills. This moderate relationship is statistically significant at 0.02; therefore, the null hypothesis is rejected. There is a moderate correlation between junior nursing students' confidence and critical thinking skills after exposure to simulation.

**Summary of Findings**

This study sought to evaluate the impact of human patient simulation (HPS) on junior student nurses' critical thinking and confidence skills. A sample of $N$=22 student nurses in their junior year at a college of nursing participated in the study. The majority of the students are female, aged between 18 and 26, African-American, partnered or married, and in active employment as they pursue their nursing education. The students were enrolled in their first medical-surgical clinical rotation at an acute care setting. The

clinical rotation included a 6-hour simulation experience as an adjunct to their clinical course. The study answered the following questions:

1. The first null hypothesis was tested using non-parametric independent-samples test. The results suggest that there was no significant difference between the pre- and posttest California Critical Thinking Skill Test scores of junior nursing students exposed to a clinical simulation experience.

2. The results of the non-parametric independent samples test for the second null hypothesis suggest that there was no significant difference between the pre- and posttest Confidence Scale scores of junior nursing students undergoing clinical simulation.

3. The results obtained from the Pearson correlation revealed no relationship between the two variables before simulation and a moderate correlation between critical thinking and confidence after clinical simulation.

In Chapter Five, the study is summarized. A discussion of the findings and appropriate conclusions are drawn. Finally, implications for nursing education and future research are offered.

# CHAPTER FIVE:

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to evaluate the impact of human patient simulation (HPS) on junior student nurses' critical thinking and confidence skills. Three research questions directed the study:

Research Question 1: What effect does the use of human patient simulations have on junior nursing students' critical thinking skills?

Research Question 2: What effect does the use of human patient simulation have on junior nursing students' clinical confidence skills?

Research Question 3: Is there a correlation between junior nursing students' critical thinking skills and confidence scores?

To answer the stated questions, the study used a two-group/control group experimental design to evaluate changes in the critical thinking and confidence skills of baccalaureate junior nursing students after exposure to clinical simulation. In this chapter, a summary of the purpose and findings from the data analysis are offered. Interpretations of the findings and conclusions, implications for the use of simulation in nursing education, and recommendation for future research will also be presented.

## Summary of Findings

The study's results suggest that critical thinking skills and self-confidence of baccalaureate junior nursing students were not influenced after a clinical simulation experience. The study's outcomes suggest that a correlation exists between the students' critical thinking and confidence skills. These findings deserve further examination as they fail to support accepted norms of clinical simulation's utility in nursing academia.

Upon closer inspection, the results can be justified, as certain limitations were clearly apparent during the course of this research. The small sample size of students in this baccalaureate-nursing program limits the generalization of these findings to larger groups of students. Another limitation that has particular relevance to the outcome of the study is the participants' engagement in taking the CCTST and the CS tests. The students were instructed to ascribe full importance in approaching these tests; yet taking part in this study contained no extrinsic reward. The difficulty lies in differentiating the value students placed on the research with the accuracy of their answers reflecting the skills being assessed.

Another aspect of the investigation that may have limited the study is the essential dimension of the simulation experience. The students were exposed to one simulated experience. This decision was made to maintain the integrity of the clinical course and to not disrupt the established prototypes of the simulation experience. This limited exposure to clinical simulation may not be sufficient to influence the thinking patterns of the students as reflected in the CCTST and CS. The measurement of the expression of newly acquired skills may be incompatible within the complexities of the clinical educational process. Repetitive and chronic contact with the simulation technology may prove to be more productive in obtaining the desired results in the dynamic processes being studied.

**Simulation and Critical Thinking**

The first null hypothesis was tested using non-parametric independent-samples to determine if there were any difference between the distribution of critical thinking pre-test and posttest scores of the participants at the .05 level of significance. The

independent samples Mann-Whitney U test was used to compare the distribution of critical thinking scores of the junior nursing students' pre- and posttest. The test summaries revealed that the distribution of the scores were the same across categories both pre- and posttest. The formulated null hypothesis: $H_0$: μgroup1 = μ group 2 was retained. The results suggest that human patient simulation had no significant effect on junior nursing students' critical thinking skills.

To substantiate the effect of human patient simulation on critical thinking skills, the California Critical Thinking Skills Test was administered to 26 students in the third quarter at the beginning of the course Caring for Adults I. After 5 weeks of clinical sessions at an acute care setting and clinical simulation, 22 students completed the CCTST as a post-intervention measurement. Based on a mean score of 13.32, the average test-taker in this group of 22 students scored between the 23rd and 31st percentiles compared to an aggregated sample of 4-year college students. These low total scores are regarded as true scores that indicate that the test takers have very weak critical thinking skills. Possible reasons for these low scores may be student disengagement due to language deficiency and distraction in the testing center. The latter was not an observable factor, yet a reasonable argument could be advanced that the complicity of participant's disengagement due to language barriers may have been worthwhile distracters deserving further examination. Chabeli and Mangena (2005) suggested that culture has a particular relevance to language acquisition and comprehension because they attest that reasoning is fueled through language and culture.

Language barriers of the students taking the CCTST were not taken into consideration based on the assumption that these students are part of the mainstream

college of nursing. Admission to the college has a functional requirement of reading skills that are suitable to scholastic work at the baccalaureate level. This admission criterion does not emphasize English language proficiency. Based on the cultural composition of the student sample, linguistic proficiency may have been a factor in obtaining accurate critical thinking assessment. As noted by Caputi, Englemann, and Stasinopoulos (2006), when English is not the student's primary language, the student requires more time to think and process information. This fundamental aspect of thinking which requires more time for all academic and clinical work was not taken into account when the CCTST was administered. This study's findings substantiate DelBueno's (2005) assertion of a crisis in critical thinking of new nurses. She found that the majority of new graduates do not possess entry-level clinical judgment ability. This observation further corroborates the need for creative modality for teaching the skills necessary for entry into nursing practice..

**Simulation and Confidence**

The second null hypothesis was tested using non-parametric independent-samples to determine if there was any difference between the distributions of confidence skills pre- and post simulation. The independent samples Mann-Whitney U test summaries revealed that the distribution of the confidence scores were the same across categories both pre- and posttest. Therefore the null hypothesis was retained. The study suggests that human patient simulation had no significant effect on junior nursing students' confidence skills. Inspection of the data reveals that self- confidence scores decreased after clinical practice and exposure to simulation. The results differ from current evaluations of the use of simulation and nursing students' level of self-confidence (Alfes,

2011; Shinnick, Woo, & Mentes, 2011). These studies found that students who participated in simulation were statistically more self-confident following simulation.

Self-efficacy demands that a person must believe in their ability to perform a behavior (Bandura, 2001). The decrease in self-confidence scores may be a true appraisal of the students' ability to perform physical assessments once they are confronted with the reality of their perceived ability at the clinical site. There is some basis for concluding that the students' self-report of confidence skills is directly related to their perception of being unprepared for the actual clinical setting. Prior to their first clinical course the students reported an inflated sense of confidence until they were confronted with the reality of bedside nursing. A practical consideration may be that the students' perception of their confidence is clarified by the realization of their lack of skills once they enter the clinical arena. Although not statistically significant, these findings suggest important opportunities for educational interventions to improve students' confidence in their ability to perform critical nursing functions over time. As Brown and Chronister, (2009) suggest, students who are further along in the curriculum have higher self-efficacy scores. Therefore, the chronic and consistent exposure to clinical simulation may be a more critical intervention in facilitating the attainment of confidence in junior nursing students.

**Critical Thinking and Confidence**

A Pearson *r* data analysis was used to test the third null hypothesis. The hypothesis stated that there is no significant correlation between junior nursing students' critical thinking and confidence skills. A Pearson *r* data analysis showed no correlation between the two variables prior to simulation, and a moderate correlation between

confidence and critical thinking skills after simulation. This moderate relationship is statistically significant at 0.02 therefore the null is rejected. The results suggest that there is a moderate correlation between junior nursing students' confidence and critical thinking skills after exposure to simulation. Contrary to this study, Hoffman and Elwin (2004) found a negative correlation between critical thinking and confidence in new nurses' decision-making skills. Their findings suggest that critical thinkers are more hesitant to make decisions and are more likely to take time to research a problem before making a decision. These findings are diametrically opposed to Kaddoura's (2010) qualitative study of new graduates' perceptions of the clinical simulation's effects on their critical thinking and confidence skills. The students reported that simulation significantly influenced their confidence and critical thinking skills. Although not a correlation study, Kaddoura (2010)'s themes indicated that simulation aids in developing critical thinking and confidence skills. The validation of the association between confidence and critical thinking is further recognized by Phan (2009) who analyzed those relationships with deep processing strategies. He found evidence that relationships between self-efficacy, critical thinking, and deep processing strategies exist. Phan (2009) further advocated that those relationships give credence to the intricacies of the learning processes over time. In view of the moderate correlation between critical thinking and confidence after exposure to simulation found in this study, it is conceivable to consider a state of dynamic interaction between the two processes and to exploit educational strategies that enhance them.

## Implications for Practice

Ten years ago, the Institute of Medicine (2001) called for academic reform to educate future nurses to render safe care in complex healthcare systems. Nursing organizations have collaborated to identify core competencies for the preparation of safe practitioners (QSEN, 2010). Patient safety remains a deliverable commodity that can only be attained when healthcare professionals practice in a persistently competent manner. The application of this simplistic truism to clinical practice requires a deliberate assessment of accepted norms with honesty and detachment so that the limitations that can obstruct the paths to educational improvement are acknowledged.

Simulation, as a technology, is being adopted as a teaching strategy in several schools of nursing to achieve core educational outcomes in nursing curricula. Yet, the research to document simulation's efficacy remains in an early stage. The Institute of Medicine (2011) recognizes that "there is perhaps no greater opportunity to transform practice than through technology" (p. 165). Although the adoption of the new technology is encouraging, the lack of empirical evidence to support its efficacy continues to plague its legitimacy. The implications for nursing practice are wide yet intriguing. With so many questions waiting to be answered and validated, nurse educators and leaders are in the enviable position of transforming these challenges into opportunities. The rapid growth of knowledge and technology creates a distinct opportunity for faculty to embrace this technology through faculty development and education, and maintain their currency in the educational process.

Just as critical thinking is an expected outcome in nursing education, technology is becoming a common expectation among the youth of this nation (Eberwein, 2011).

Convergence of both expectations creates a potential for educational leaders to transform nursing curricula that is responsive to the needs of the healthcare industry. Based on sound teaching principles, nursing faculty can facilitate learner-focus lessons that integrate simulation technology and create richer fields of data for empirical studies. As nursing faculty embrace simulation as an adjunct to clinical practice, they may be able to demonstrate through ongoing research specific learning goals that can be achieved with the modality.

## Implications for Research

The major implications of this study suggest the need for further studies. As indicated by Issenberg, Ringsted, Østergaard, and Dieckmann, (2011), research will be a "dynamic entity in advancing the field of simulation to the benefit of patients and healthcare professionals"(p. 155). Given the preceding context, Issenberg et al. (2011) appeal for continuing research to improve the simulation community's understanding of conceptual issues surrounding the teaching method. They maintain that future inquiry in simulation needs to optimize the effectiveness of simulation with the interplay of healthcare professionals, technology, organizational systems, and patients.

## Recommendations

Given the findings of this research and the limitations previously identified, several recommendations for future inquiry are identified:

1. A larger sample from a more diverse population with control for linguistic proficiency.
2. A longitudinal study over the course of the curriculum to explore the insinuation that critical thinking improves with simulation over time.

3. Qualitative or mixed methods approaches to study the concepts of confidence and critical thinking with clinical simulation.

4. Evaluation of clinical simulation's effect on critical thinking skills and confidence of graduate nurses using all five campuses of the College of Nursing located throughout the southeastern United States.

## Conclusion

Recognition of the value of simulation in clinical teaching raises the possibility of its advancement through evidence-based practice. The Institute of Medicine (2010) reaffirms that clinical simulation "will play an important role in the development of skill-based training for students" (p. 39). Nurse educators are in the desirable position to embrace simulation as a trajectory to curricular reform. Nursing faculty also have a responsibility to create communities of learning where scholastic practices are amenable to research that advances the study of critical thinking and confidence as outcomes to nursing education. Simulation is an attractive tool of instruction that offers the prospect of collaborative and evidence-based clinical training. In pursuing these objectives, nurse educators may establish the ultimate effectiveness of simulation as a viable adjunct to clinical teaching.

New health care reforms have the potential of making healthcare more complex (Davis & Somers, 2011). As direct care givers nurses play an integral part in maintaining the quality of care that is rendered within that industry. To sustain excellence in the workplace nurses must be prepared with adequate skills in caring for clients in need of health care services. The preparation of future nurses requires rigorous preparation from experienced faculty equipped in diverse methodological approaches conducive to

teaching future generations. Simulation offers a promising model for transitioning future nurses to the realities of the multifaceted healthcare system.

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# APPENDICES

# APPENDIX A

## Correspondence for Institutional Permission

Yanick D. Joseph, MPA, MSN, RN

Priscilla Bartolone, DNS, RN
Department Chair Nursing Program
South University College of Nursing
9800 Belvedere Ave
West Palm Beach, Florida 3341109

November 1, 2010

Dear Dr Bartolone:

The purpose of this letter is to seek your permission to conduct a research study with the junior nursing students during the Clinical Simulation Practice course in Quarter 3. As a partial fulfillment of the requirements for doctoral degree in Higher Education at Argosy University, I am researching the "*effect of human patient simulation's (HPS) impact on junior student nurses' critical thinking and confidence skills*". Two diagnostic instruments will be given to junior nursing students in quarter 3 before and after the clinical simulation experience during the spring of 2011. The California Critical Thinking Skills Test and Confidence Scale tests can be completed about 60 minutes. Additionally the students will complete a short demographic survey. All information gathered during this study will be kept confidential and will become part of the data for determining the critical thinking skills and self-confidence of the students before and after the simulation experience. No connection from specific reports or publications will be identified in the research linking with the university or the nursing program. The participation of the junior nursing students will be voluntary and they may choose to withdraw from the study at any time without penalty.
Your consent to conduct this study will be greatly appreciated. I look forward to your response at the earliest possible time.

Sincerely,

Yanick D. Joseph, MPA, MSN, RN
Associate Professor, South University Nursing Program

Yanick D. Joseph, MPA, MSN, RN

Jeffrey B. Willens, Ph.D.
South University – West Palm Beach|
Dean of Academic Affairs and Operations
9801 Belvedere Road, Royal Palm Beach, FL 33411

November 1, 2010

Dear Dr. Willens:

I am requesting permission to conduct my dissertation research at South University College of Nursing at Royal Palm Beach. The purpose of this study will be to investigate the "*effect of human patient simulation's (HPS) impact on junior student nurses' critical thinking and confidence skills*".

The study is planned for the Spring 2011 quarter involving the junior nursing students who choose to participate in the research. The diagnostic instruments that will be used in this study are the California Critical Thinking Skills Test and the Confidence Scale. My dissertation committee at Argosy University/Online accepted my formal research proposal. A copy of my proposal will be forwarded to you as requested.

Prior to implement this study, it will be submitted for approval to the Institutional Review Board (IRB) of my educational institution at Argosy University/Online. A requirement of the IRB is to submit a letter of permission from South University on letterhead from high officers in the institution regarding this study. I am requesting a formal letter from you to conduct this study at the Royal Palm Beach College of Nursing campus.

I appreciate your attention to this matter, as I truly believe it will enhance the quality of education at South University College of Nursing.

Sincerely,

Yanick D. Joseph
Associate Professor, South University Nursing Program

# APPENDIX B

## Correspondence With Dr Susan Grundy

Yanick D. Joseph, MSN, RN

California State University
Division of Nursing
6000 J Street
Sacramento, California 95819-6096

March 16, 2010
Dr. Susan Grundy:

I am presently pursuing my doctoral degree in higher learning at Argosy University Department of Education. The purpose of my study is to evaluate the impact of human patient simulation on critical thinking skills and self-confidence levels in junior nursing students enrolled at the University.
I have found that the Confidence Scale (CS) to be an appropriate diagnostic tool to collect the necessary data for my research project. My target population will be junior nursing students enrolled in their first nursing course, and the number of subjects to be included in the study will be around 38 students. I plan to administer the CS before and after the junior nursing students' clinical simulation experience during their first semester in from October to December 2010.

Thank you for your consideration of this request and I look forward to hearing from you.

Sincerely,

Yanick D. Joseph, MSN, RN
Associate Professor, Nursing Program

SACRAMENTO STATE

**California State University, Sacramento**
**Division of Nursing**
6000 J Street•El Dorado Hall•Sacramento, CA 95819-6096
(916) 278-6525•(916) 278-6311 Fax • www.hhs.csus.edu/nrs

Susan Grundy Ed. D., R.N.

Division of Nursing

California State University, Sacramento

6000 J Street

Sacramento, CA 95819-6096

April 16, 2010

Yanick D. Joseph, MPA, MSN, RN
8023 120th Ave. North
West Palm Beach, Florida 33412

Dear Mr. Joseph:

You have my permission to use the Self-Confidence Scale in your dissertation research at Argosy University. Please feel free to modify the copy of the instrument enclosed. The C-Scale is under copyright protection but there is no fee attached to using it. I do ask that you credit me as the developer of the original instrument. In referencing the scale, use the January / February 1993 article published in *Nurse Educator*.

Good luck in your research. I would love to have a copy of the abstract of your results when you are finished.

Sincerely,

Susan Grundy, Ed.D., R.N.

grundys@csus.edu

# C-Scale

Code Number: _____

**Directions:** Circle the number which best describes how you perceive your current ability to perform a head-to-toe assessment on an adult in the hospital. (NOTE: Make sure that the circle encloses just ONE number.)

1. I am certain that my performance is correct:

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| not at all certain | certain for only a few steps | fairly certain for a good number of steps | certain for almost all steps | absolutely certain for all steps |

2. I feel that I perform the task without hesitation:

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| I have much hesitation | a fair amount of hesitation | a good part of it without hesitation | almost completely without hesitation | absolutely no hesitation |

3. My performance would convince an observer that I'm competent at this task:

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| not at all | agree, a little | for much of it | for almost all of it | for absolutely all of it |

4. I feel sure of myself as I perform the task:

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| not at all | very little | for much of it | for almost all of it | for absolutely all of it |

5. I feel satisfied with my performance:

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| not at all | very little | for much of it | for almost all of it | absolutely satisfied with all of it |

# APPENDIX C

## Correspondence With Insight Assessments

RE: Insight Assessment- Quote Request Clarification
From: James Morante jmorante@insightassessment.com

To: yjosephw@aol.com
Subject: RE: Insight Assessment- Quote Request Clarification
Date: Tue, May 4, 2010 5:21 pm)

Hi Joseph,

I've worked up your price quote for you. By the way, congratulations on being approved for doctoral dissertation research pricing. Your professor's letter and your application were received and approved.

As you'll see in the User Manual that comes with the Specimen Kit for the CCTST, there is no problem using this particular instrument for both pre and post testing. It has been used this way with hundreds of thousands of test takers. In some cases with as short a time as 3 or 4 weeks between taking the pre and the post test. I don't recommend such a short time since it's unlikely that an educational intervention could have much of an effect in such a small window of time, but that's a different question.

If you expect to pretest and then posttest 38 people, then you'll need 76 test administrations (uses) altogether. You can split your purchase into two parts, of course, and initially buy only the number you need for the pretest. Then some months or years from now, buy the post test uses.

I've attached a price quote for 38 test uses only, assuming that you'd want to save money at this point of time and buy the post testing uses later.

You did not indicate if you wanted paper-and-pencil testing or online testing. The price is the same either way, so you can make your decision based on the research parameters involved in gathering high quality data. A controlled, distraction-free testing environment with test-takers suitably motivated to give their best effort are two important factors.
Yours, James

James Morante,
Ph.D. Insight
Assessment
www.insightass
essment.com

*Measuring Critical Thinking Worldwide*

# APPENDIX D

## IRB From Argosy University

**Application for IRB**

**Argosy University-IRB#_____ Date Received ____/____/____**

**Human Subjects Review - Institutional Review Board**

**Application for IRB Review of Research Involving the Use of Human Subjects**

*Application Status and Chair
Exempt_____(Minimal Risk -Department Committee
Expedited _X_(Moderate Risk-Department Committee and Chair)
Full _____ (High Risk - Full HSRC Member Review)

Investigator's Name: Yanick Deltor Joseph

Email Contact: _____

Address: _____

Title of Research Project: Effect of Human Patient Simulation on Junior Nursing Students' Critical Thinking and Confidence Skills.

Name of Chair/Co-Chair: Dr Michael Marrapodi

College and Department: BUS_____ PSYCH_____
EDUC_X____ OTHER_____

Program and Degree of Study: Education Leadership Ed. D

Project Proposed Start Date: April 2011 Project Proposed Completion Date: May 2011

Dissertation Committee Chair Signature/Date _____/_____

Principal Investigator Signature/Date _____/_____

DO NOT COLLECT DATA PRIOR TO RECEIVING IRB APPROVAL

**Important Notice:**

- Please complete this form in detail, acquire signatures of the Principal Investigator and the Dissertation Chair, then submit the form to the HSRC Chairperson with attachments relevant to this project (letter of informed consent, questionnaires, test protocol, interview questions, observational charts, institutional permission from site where research is to be conducted, parental permission if subject is under 18, completed HSRC form, designated IRB category).
- Do not proceed with any research work with subjects until IRB approval is obtained.
- If any change occurs in the procedure, sample size, research subject, or other element of the project impacts subjects, the HSRC must be notified in writing with the appropriate form (see ancillary forms).
- **Please allow 30 days for processing Exempt and Expedited Forms, and 60 days processing for Regular**

HSRC contact:_____Date Logged In:_____Date Approved:_____Date Expires:___

# APPENDIX E

## Correspondence With Students

TO: Baccalaureate Junior Nursing Students

FROM: Yanick D. Joseph, MPA, MSN, RN, Associate Professor, South University Nursing Program

DATE:

RE: Consent Form for Participation in Research Study

I would like to invite you to assist me in conducting a research study for my doctoral degree in Higher Education at Argosy University. The purpose of my study will be to "evaluate human patient simulation's (HPS) impact on junior student nurses' critical thinking and confidence skills". The study will involve baccalaureate junior nursing students enrolled in the Clinical Simulation Practice course at the West Palm Beach Nursing Program in Quarter 3.

Before agreeing to participate in this research study, it is important that you understand that your responses and scores will be kept confidential and you will not be identified in the research in connection with any specific reports or publications.

To collect the appropriate data the California Critical Thinking Skills Test and the Confidence Scale in assessment skills will be used. If you choose to participate in this study, you will be asked to complete these two instruments at the beginning and at the end of your clinical simulation experience. These tests will take approximately 60 minutes to complete at the beginning of your clinical simulation and another 60 minutes at the end of your experience. Students who choose not to participate in this study will not be required to complete any of these instruments.

Your participation is voluntary and you have the right to withdraw at any time from this study without penalty or negative consequences of any kind. By choosing not to participate in this study will have no effect on your grade in the Clinical Simulation Practice course or standing in the nursing program.

You will not be awarded any extra credit or be given any special consideration if you choose to participate in the study. Although it may be inconvenient for you to participate in this study, there will be no anticipated foreseeable risks associated in your participation in this research. The expectation of this study is that the result may contribute to increasing knowledge in the nursing education field and the impact of clinical simulation on enhancement of critical thinking skills and self-confidence in assessment skills prior entry into professional practice.

If you have further questions regarding this study, you may contact me at yjosephw@aol.com or at 561-632-2234
This study is conducted under the direction and approval of the IRB Doctoral Committee at Argosy University.

Your signature below indicates that you have read or have had read to you the above and that you confirm all of the following:

- The primary researcher, Yanick D. Joseph, MPA, MSN, RN, has explained the study to you and answered all important questions you have about this study. You have been told the possible benefit of this study and that you will not have any risks when participating in this study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights of benefits.
- You understand that if you choose to participate in the study you will not be given extra credit towards any coursework's nor will you be given any special consideration or treatment while associated with South University Nursing Program.
- You understand that your only commitment to the study is approximately 1 hour of time at the beginning of your clinical simulation and another 60 minutes at the end of your clinical experience.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

I, _____, have read and understand the foregoing information provided explaining the purpose of this research and my rights and responsibilities as a participant of this study. By signing this consent, I agree to voluntary participation in this research and in return the researcher will abide to the terms and conditions stated above.

_____
Print Name of Participant

_____ _____
Signature of Participant Date

I, _____, certify that I have reviewed the contents of this for m with the subject signing above. I have explained all the terms and conditions for conducting this study. As participant in this study you understood the explanation given.

Yanick D. Joseph, MPA, MSN, RN_____
_____
Print Name of Principal Investigator

_____ _____
Signature of Principal Investigator Date

# APPENDIX F

## Student Survey

Student Survey

Spring 2011

Please help identify the demographics population of the participants completing this survey. The survey is anonymous requiring limited demographic information. Please place a check mark on the appropriate boxes of each category. After completing the survey, place in the accompanying sealed envelope. Thank you for your cooperation in completing this survey.

| | | |
|---|---|---|
| 1. | Cultural Background | Black/African American<br>Caucasian<br>Hispanic<br>Asian<br>Native American<br>Other/Specify_____ |
| 2. | Gender | Male<br>Female |
| 3. | Marital Status | Single<br>Married/Partnered<br>Divorced<br>Widowed<br>Other/Specify_____ |
| 4. | Age | 18-22 years<br>23- 26 years<br>27-30 years<br>31-35 years<br>36-40 years<br>41+ years /Specify_____ |
| 5. | Employment Status | Yes<br>No |
| 6. | Clinical Experience | Patient Care Assistant<br>License Practical Nurse<br>Other/Specify_____ |