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The Effects of Simulation on Junior Level Baccalaureate Nursing Students' Self-Efficacy and Intrinsic Motivation

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THE EFFECTS OF SIMULATION ON JUNIOR LEVEL BACCALAUREATE NURSING STUDENTS' SELF-EFFICACY AND INTRINSIC MOTIVATION

by

MICHELLE E. DYKES

(Under the Direction of Dan Rea)

ABSTRACT

Nursing education is experiencing a generational phenomenon with student enrollment spanning three generations. Classrooms cultures are changing today and include some Baby Boomers and large numbers of Generation X, Generation Y, and second-degree seeking students. These culturally diverse groups of students have unique sets of learning characteristics. Given the current challenges of growing student diversity, balancing budgets, and meeting faculty shortages, nursing schools are pressed to find alternative teaching methods that are not only cost and labor saving but also effective and equitable for the diverse student groups.

This quantitative, experimental research design study explored the effects of the alternative teaching methods of human patient simulation (HPS) and virtual clinical excursion (VCE) on self-efficacy and intrinsic motivation of 126 culturally diverse junior level nursing students. The purpose of this study was to determine if these simulation activities were motivationally effective and equitable teaching methods for students of culturally diverse generation and degree.

The *Intrinsic Motivation Inventory* (IMI) group mean score of the HPS group revealed significantly higher IMI scores than the VCE group. While many HPS subscale scores were higher, VCE scores were still on the higher end of the Lickert scale. The results did not consistently confirm that any one particular cultural demographic group benefitted more or less from either HPS or VCE experience.

None of the main effects were significant for any of the general self-efficacy change scores. Only one interaction was significant: simulation type/degree status for the GSE score with midlevel degree type HPS students experiencing a largely higher mean gain in GSE between the first two assessments than those in the VCE experience.

Culturally competent educators may use the findings of this study to begin a dialogue regarding appropriate simulation activities for the changing culture of nursing students. Results of this study indicated that, while overall IMI scores were higher for HPS than for VCE, both types of simulation were motivationally appropriate and effective teaching methods for all types of students, regardless of cultural demographic factors. In addition, GSE scores remained relatively constant, indicating that both types of simulation were appropriate and effective for all groups in this study.

INDEX WORDS: Simulation, Culture, Self-Efficacy, Generation X, Generation Y, Intrinsic Motivation, Second-Degree

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COMMONLY USED ABBREVIATIONS

Abbreviation	**Term**
AACN	American Association of Colleges of Nursing
BSN	Bachelor of Science in Nursing
CFT	Cognitive Flexibility Theory
CON	College of Nursing
GSE	General Self-Efficacy Scale
HPS	Human Patient Simulation/Simulator
IMI	Intrinsic Motivation Inventory
IRB	Institutional Review Board
NCLEX	National Council Licensure Examination
NLN	National League for Nursing
RN	Registered Nurse
VCE	Virtual Clinical Excursion
VSU	Valdosta State University

CHAPTER 1

INTRODUCTION

Higher education is faced with many new social and economic demands, including budget cuts and increased student diversity. Institutions are being challenged with decreasing funds from both state and federal sources yet are expected to provide adequate educational experiences for students (Skiba & Barton, 2006). Nursing education is no different. Nursing education faces the challenges of drastic budget cuts and an ever increasing culturally diverse student population (Jeffries, 2005), yet nursing education is also faced with the challenges of faculty shortages, limited clinical placement sites and experiences, nursing shortages that demand more nursing graduates, and higher expectations from employers (Jeffries, 2005).

In 2002, the National League for Nursing (NLN) projected a shortfall of the 20,000 faculty members needed across the nation to accommodate these larger numbers of students. A second report released in 2010 reported that nurse faculty vacancies continued to grow even as the numbers of full-time and part-time educators increased (NLN, 2010). The study showed that nationwide there were more than 1,900 unfilled full-time faculty positions, in 2007 affecting over one-third of all nursing schools. A survey done by the American Association of Colleges of Nursing (AACN) (2006) indicated that 409 nursing schools reported 817 faculty vacancies. The AACN and the NLN both report that the average age of retirement for nurse faculty is 63, which is not promising since the average age of faculty is 51.5 (Tanner, 2006). As faculty increase in age, they tend to possess less stamina needed to engage in the harshness of 8 to 10 hour clinical workdays with students (Curl, Smith, Chisolm, Hamilton, & McGee, 2007).

Employers who receive new graduate nurses are raising their expectations and are demanding that educators do a better job of preparing students for the real world of nursing

(Jeffries, 2005). This is especially challenging due to the increasing faculty shortage and limited availability of clinical placement sites. To address the demand for new nurses, many states are implementing new nursing programs. The increase in the numbers of nursing students has placed significant strain on clinical agencies with regards to student placement. In addition, these institutions must limit the faculty to student ratio during each rotation.

To address these demands, the National Advisory Council on Nurse Education and Practice wrote a recommendation that simulation technology be implemented (Health Resources and Services Administration, 2002). The American Federation of Teachers' (2005) Nurse Faculty Shortage Task Force followed with a recommendation that simulation be investigated as a creative way to teach clinical skills. Given, these recommendations, along with the increased demand for nurses, the limited clinical and faculty resources available for nursing students, and the higher expectations from employers, teaching simulations have become a necessary alternative for nursing clinical education. Simulations are safe and efficient teaching strategies that mimic the reality of the clinical nursing environment (Rothgeb, 2008). Using devices such as interactive videos and mannequins, simulations demonstrate relevant nursing procedures and train nurses in critical decision-making (Jeffries, 2005).

Nursing students often report lack of self-confidence and apprehension when they are expected to meet performance criteria (White, 2003). In nursing, developing confidence as a nurse can influence clinical decision-making (White, 2003). Self-efficacy, often referred to as self-confidence, is essential to nurses' ability and performance in the clinical setting. Many studies have shown that simulation is an effective method for improving student self-efficacy (Bantz, Dancer, Hodson-Carlton, & Van Hove, 2007; Bremner, Aduddell, Bennett, & VanGeest, 2006; Eaves & Flagg, 2001; Henneman & Cunningham, 2005; Kuznar, 2007; Lasater, 2007; Leigh, 2008; McCausland, Curran, & Cataldi, Reilly & Spratt, 2007).

Shifts in the economy and the desire of many adults to make a post-September 11 differences in their work have brought a change in the nursing student population (AACN, 2010). Recent events have triggered a desire in many individuals to find greater meaning in their work and to help others (Miklancie & Davis, 2005). These individuals are reevaluating their priorities and are seeking careers that involve caring for people in need. In addition, the unpredictable economy has also contributed to changing priorities. With the Bureau of Labor Statistics projecting the need for more than 580,000 new and replacement registered nurses by the year 2018, people are seeking stable careers.

To address the increasing nursing shortage, nursing schools around the country began exploring creative ways to increase student capacity and reach out to new student populations (AACN, 2010). While the numbers of the new generation of "Millennial" students are increasing in the traditional BSN programs, the creation of accelerated BSN programs has dramatically brought an increased interest in the nursing profession among "second-degree" students because they offer the quickest route to becoming a registered nurse (AACN, 2010).

With the increasing diversity in the nursing student population and because simulation equipment is expensive and requires additional space, faculty, and time, this study proposes to answer questions regarding the instructional value and equity of simulation education. As nursing schools are faced with increasing student cultural diversity in enrollment while cutting costs, schools may jump on the simulation bandwagon to accommodate larger numbers of students. Currently there is no information to determine if schools are considering the motivational and learning differences of the students from the various generations and from those with previous bachelor's degrees.

This study adds new information to an existing knowledge base regarding simulation and nursing education by investigating the effects of simulation on the self-efficacy and intrinsic motivation of culturally diverse students. More specifically, this study explores the effects of two forms of simulation on diverse students' self-efficacy and intrinsic motivation. Using a pre-test/post-test, experimental design, this study measured student self-efficacy beliefs related to specific junior level clinical objectives prior to and after a scripted simulation experience and after one two-day hospital clinical rotation. Two forms of simulation; human patient simulation (HPS) and virtual clinical excursion (VCE) were used to determine if one form is more or less effective than the other in relation to student self-efficacy beliefs. In addition, descriptive statistics were used to describe student intrinsic motivation related to the specific simulation experience.

The theoretical framework encompasses concepts from Knowles's Andragogical Theory of Adult Learning, social constructivism, cognitive flexibility theory, Bandura's social cognitive theory, and simulation as alternative instruction. While constructivism establishes that, as learners, we reflect on our personal experiences to develop our own understanding of the world we live in (Brooks & Brooks, 1999), social constructivism and the work of Lev Vygotsky propose that students learn differently based on their socio-cultural interactions and backgrounds. The main goal of cognitive flexibility theory is to understand how learners are able to transfer their learning across different contexts and situations (Spiro, R., Coulson, R., & Anderson, D., 1988). Bandura's social cognitive theory maintains that a learner's behavior both influences and is influenced by personal factors and the social environment. Learners proactively engage in their own development and are able to make learning happen by the social actions they take. It is their self-beliefs that allow them to take control over their own actions, feelings, thoughts, and the environment (Pajares, 2002).

Statement of the Problem

The landscape of nursing education has changed dramatically in the past two decades, resulting in a transformation of how nurse educators "educate," (Revell & McCurry, 2009). Due to the severe nursing shortage along with a declining economy and increasing unemployment rate, schools of nursing are instituting creative ways to increase student enrollment (Cangelosi & Moss, 2010). As enrollment continues to increase, educators are faced with a more culturally diverse student population. Educators are faced with educating multigenerational students and students with previous educational experience. After an extensive literature search and attendance at many simulation conferences, no literature or research has been found that considers demographic cultural factors such as generational type or previous degree in relation to various simulation exercises. Knowledge gained from this study is currently needed to determine the appropriateness of various forms of simulation to the changing culture of nursing students.

Technology is rapidly being integrated into nursing education as a way to bridge the difference between faculty and students (Black & Watties-Daniels, 2006). Technology, in the form of simulation, is a rapidly expanding research area in the field of nursing. According to Sinclair and Ferguson (2009), the majority of research about simulation is described as either a stand-alone exercise or as part of a clinical course. Currently, literature related to self-efficacy and simulation has become more readily available; however, studies comparing effects of various forms of simulation, especially high-fidelity simulations, on culturally diverse groups of students are still needed. For example, various studies have reported that students, in general, who participated in simulation claim an improvement in clinical performance, increased confidence when attempting skills, and lower levels of stress in the clinical setting (Alinier, Hunt, Gordon, & Harwood, 2006; Bremner, Aduddell, Bennett, & VanGeest, 2006; Chang, Chung, & Wong, 2002). Another study done by the Singapore Institute of Technical Education also reported that students, in general, believed using human patient simulation (HPS) increased their critical thinking skills and confidence (Kiat, Mei, Nagammal, & Jonnie, 2007).

Research Questions

The specific purpose of the study was to evaluate and compare the effectiveness of virtual clinical excursion (VCE) simulation and human patient simulation (HPS) as teaching strategies on perceived clinical self-efficacy and intrinsic motivation for culturally diverse, first-year Junior II nursing students enrolled in NURS 3211: Health Promotion of Adults. The following research questions framed the analysis in this study:

1. Based on the demographic cultural factors of generational type and previous degree, to what extent, if any, do post-simulation and post-clinical intrinsic motivation scores differ between students exposed to virtual clinical excursion (VCE) and human patient simulation (HPS)?
2. Based on the demographic cultural factors of generational type and previous degree, to what extent, if any, do nursing pre-simulation, post-simulation and post-clinical self-efficacy scores differ between students exposed to virtual clinical excursion (VCE) and human patient simulation (HPS)?

Delineation of Variables

The variables investigated in this study are students' responses to the Pre-Simulation General Self-Efficacy Scale (Appendix D), Post-Simulation Intrinsic Motivation Inventory (Appendix E), Post-Simulation/Pre-Clinical General Self-Efficacy Scale (Appendix F), and Post-Clinical General Self-Efficacy Scale (Appendix G). These responses represented the measures of the research variables of general self-efficacy and intrinsic motivation of the participants. Student demographic information was determined by answers provided on the author-developed demographic form (Appendix C).

Definition of Terms

The definitions of terms used in this study are:

Simulations: activities that mimic the reality of a clinical environment and are designed to demonstrate procedures, decision-making, and critical thinking through techniques such as role playing and the use of devices such as interactive videos or mannequins (Jeffries, 2005).

Human Patient Simulation: a simulation experience in which a high-fidelity human patient simulator is used to provide students with a realistic recreation of a patient clinical scenario

Virtual Clinical Excursion: a simulation experience using a computer software program that presents students with patient clinical scenarios.

Perceived Self-Efficacy: people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave (Bandura, 1994).

Intrinsic Motivation: involves people doing an activity because they find it interesting and derive spontaneous satisfaction from the activity itself (Gagne & Deci, 2005).

Junior II - Level Nursing Student: a student who has completed the first semester, junior I, of the baccalaureate nursing program and who is currently enrolled in second semester, junior II, coursework for the first time.

Second-Degree Student: a student who has already graduated with a previous bachelor's degree or higher and is returning to school to obtain a second bachelor's degree in a different field of study.

Baby Boomer: a student born between the years of 1943-1960

Generation X: a student born between the years of 1961-1981. Often referred to as the Digital Immigrant

Generation Y: often referred to as the Net Generation, Digital Native, or Millennial Student, this student was born between 1982-1991.

Hospital Practicum: one day of a hospital clinical rotation on a medical-surgical unit under the supervision of a clinical instructor.

Significance

Given the pressing social need to effectively train a growing number of student nurses coming from diverse backgrounds, it is important to investigate the possible differential effects of various types of simulation on the self-efficacy and intrinsic motivation of diverse groups of student nurses. This research may help nurse educators to improve the design of learning experiences to effectively meet the cultural needs of diverse student nurses.

Self-efficacy and the motivation to initially attempt and master a skill are essential variables in a successful nursing education. Unfortunately, developing these attributes requires exposure to situations in which skills may be attempted and mastered. Using simulation for skill acquisition prior to nursing student clinical rotations may increase student self-efficacy and, in turn, strengthen the belief that they have control of their learning environment (Rockstraw, 2006). Learning in a simulation environment that allows for errors while protecting the patient gives the learner a real world practice setting that should improve confidence and reduce errors (Nehring, Ellis, & Lashley, 2001). However, with the increasing diversity in nursing students, no research has been done to determine its effectiveness on students with demographic cultural factors such as generational type or previous degree.

This study is important to curriculum studies, especially nursing education, for a number of reasons. First, simulation centers are becoming the new centers of teaching excellence (Grenvik, Schaefer, Devita, & Rogers, 2004) yet no study has explored simulation effectiveness and equity among students with diverse cultural backgrounds. Second, with the limited hospital clinical resources available, simulation environments are needed to supplement the traditional clinical environment. Third, simulation allows students to develop nursing skills needed for nursing practice in a safe, non-threatening environment. The findings of this study may validate and emphasize the role of self-efficacy and its influence on human behavior, particularly in the process of preparing a graduate nurse who can critically think with good clinical judgment leading to sound clinical reasoning (Michael, 2005).

Assumptions and Limitations

For the purpose of this study, the following assumptions are made:

1. The students to be surveyed in this study will understand the questions on the *General Self-Efficacy Scale* (GSE) and the *Intrinsic Motivation Inventory* (IMI).
2. Student self-efficacy and intrinsic motivation regarding clinical objectives can be measured.

The predicted limitations of this study include:

1. The possibility of social desirability influencing answers on the *General Self-Efficacy Scale* (GSE) and the *Intrinsic Motivation Inventory* (IMI) does exist.
2. A research sample taken from one educational institution limits the generalization of findings.

Summary

Due to a shortage of nurse educators and nurses in the United States, there is an urgent social need to effectively train more student nurses. Hence, simulation exercises have become a necessary alternative to clinical education. There is documentation that simulation provides a safe, non-threatening learning environment, which allows for the development of student self-efficacy and confidence when attempting skills in the actual clinical environment. Limited documentation exists comparing the effects of various types of simulation on nursing student self-efficacy and intrinsic motivation and no research was found that examined simulation effectiveness and equity on students from various demographic cultural backgrounds.

The theoretical framework explores concepts from Knowles's Andragogical Theory of Adult Learning, social constructivism, cognitive flexibility theory, Bandura's social cognitive theory, and simulation as alternative instruction. Using an experimental design, this study compared student self-efficacy scores prior to a simulation experience, after a simulation experience, and after a hospital clinical rotation. It also explored post-simulation intrinsic motivation scores, taking into consideration diverse student demographic cultural factors such as generational type and previous degree. Within group comparisons of self-efficacy and intrinsic motivation scores were made as well as between group comparisons using two different types of simulation, Human Patient Simulation and Virtual Clinical Excursion.

CHAPTER 2

REVIEW OF LITERATURE

This chapter provides a review of literature relevant to curriculum studies by discussing simulation, self-efficacy and intrinsic motivation, and nursing students' changing demographics and cultural context. Literature related to the changing cultural context of nursing students and educational implications related to these changes is explored. Three generations of nursing students, baby boomers, generation X, and generation Y are described and learning implications are discussed. Second-degree seeking students are then further described.

The theoretical framework of the study includes four theoretical perspectives: Knowles's andragogical theory of learning, social constructivism, cognitive flexibility theory, and Bandura's social cognitive theory. Using the knowledge from these four theoretical perspectives, the reader may gain a general understanding of how culture, self-reflection, self-efficacy, and real-world learning apply to nursing education and the simulation experience.

Following the theoretical framework, self-efficacy is explored in more detail. Self-efficacy as it relates to academic and task performance and self-efficacy in real-life situations are discussed. This section bridges the gap between self-efficacy and the simulation experience as it relates to student clinical success in a baccalaureate nursing program.

The conclusion of this chapter briefly discusses the cost of the various types of simulation. In addition to effectiveness and equity, understanding and comparing costs of simulation experiences is important for the reader as they begin to weigh the costs versus benefits of simulation experiences.

Cultural Context of Nursing Education

A widely publicized national nursing shortage has resulted in a surge of interest in the nursing profession. To address the increasing nursing shortage, nursing schools around the country began exploring creative ways to increase student capacity and reach out to new diverse student populations (AACN, 2010). Educators are now being faced with the challenge of adapting their teaching styles to accommodate new types of learners (Skiba & Barton, 2006). As Prensky (2001) stated, “Our students have changed radically. Today’s students are no longer the people our educational system was designed to teach” (p. 1). Nursing education is experiencing a generational phenomenon with student enrollment now spanning three generations (Delahoyde, 2009). The three generations are often referred to as the baby boomer generation, generation X, and generation Y.

Baby Boomers

The baby boomers are a generation of students who were born between the years of 1943-1960 (Strauss & Howe, 1991). A product of a “boom” in births after World War II, they quickly became the largest generation of their time and their values and beliefs were shaped by important events in their lives such as the Civil Rights Movement, the advent of the birth control pill, Woodstock, and the Korean and Vietnam Wars.

Because this generation grew up during a time of economic prosperity and educational expansion, a large number of them were given opportunities to attend college. With the large number of individuals going to college, this group was motivated to do whatever they could to become successful and stand out in the crowd (Coates, 2007). As a result of increased motivation, this generation is often labeled as competitive and strong-willed. They exhibit good work ethic in the classroom and often become frustrated with younger generations who have a different set of values.

Baby boomers in 21st century classrooms are often seeking a second career. They are often accustomed to traditional pedagogy and prefer lecture, handouts, and taking notes (Johnson & Romanello, 2005). In addition, this group tends to like interactive activities such as group discussions and is very concerned with grades. They often struggle with technology but are willing to learn it to continue to be competitive and successful. According to Weston (2001), their adaptations to technology are likely due to their motivation to be more productive as well as have more free time.

Generation X

Generation Xers were born between the years of 1961-1981 and are the smallest generational cohort in history (Strauss & Howe, 1991). Those who grew up in this generation grew up in a time where 50% of all marriages ended in divorce and record numbers of children were being raised by single parents and coming home after school to an empty house (Coates, 2007). This generation is the most independent and resourceful group of individuals as a result of being left to fend for themselves. They typically do not take anything for granted due to the uncertainty of their future. This group generally adapts well to change and is assertive and self-directed (Weston, 2001).

Generation X does not show the same commitment to organizations in the workforce as previous generations. Since they watched their parents give up spending time with their families in order to get ahead in their careers, this generation seeks more balance in their lives and values spending time with family (Coates, 2007). They expect work to be fun as they balance leisure and work time (Kupperschmidt, 2000). They often have little regard for corporate life and frequently challenge authority and status quo.

This generation has been studied extensively since they have been on the college scene for over twenty years and continues to be a dominant force in college classrooms since many are seeking second careers. Collins and Tilson (2006) found that these students like to perform tasks independently and prefer a variety of teaching methods such as self-directed activities, online courses, and activities with visual aids.

The NLN estimates that in 2009, students over 30 years old constituted 14% of BSN students, 49% of Associate Degree Nursing students, and 69% of RN-BSN students (NLN, 2010). This group of students is also known as “digital immigrants.” They were not born into the digital world and have had to adapt to the changes in technology that have occurred throughout their lives. Some are able to adapt better than others and many feel as though they have been “socialized” differently from the younger digital natives and are now trying to learn a new language.

Having grown up with technology, members of Generation X are fairly technologically literate and are good at multi-tasking. Since they use technology on a daily basis, they are comfortable with technology and adapt well to change (Johnson & Organelle, 2005). They expect the use of technology in the classroom along with instant response and satisfaction. Time is a precious commodity for this generation and they prefer the easiest and quickest way to learn. They have little regard for wasted time or non-relevant information (Coates, 2007; Johnson & Organelle, 2005).

Generation Y

Generation Y, often referred to as the Millennial or the Net Generation, are now entering colleges and universities. Classified into age groups based on the time period in which they were born, Oblinger and Oblinger (2005) describe millennials as students who were born between 1982-1991. Howe and Strauss (2000) classify the millennial student as one who was born between 1982 and the present. The millennials are three times larger than the baby boomers and are the most culturally diverse and globally mobile generation in our nation's history. Millennials were raised during a time when terrorism, violence and drugs were realities in their everyday lives (Sherman, 2006).

According to the National League for Nursing (NLN), 86% of students enrolled in BSN program in 2009 were less than 30 years old (NLN, 2010). This group of students is representative of the typical tradition BSN student of today. Tapscott (1998) described the millennial student as an assertive, self-reliant, curious person who is enmeshed in an interactive culture that centers around themes of fierce independence, emotional and intellectual openness, greater inclusion of diversity, free expression and strong views, innovative in pushing technology to its next level, preoccupied with maturity, views the world as 24/7 and demands real time and fast processing, like customization and want to have options and to try before they buy, and they know and need to verify and check resources and authenticate people. Howe and Strauss (2000) describe the millennial student as being fascinated with new technologies, needing group activities, emphasizing extracurricular activities, and focusing on grades. Being smart is cool for the millennial student. They are often close to their parents and are one of the most ethnically diverse groups of students in academia.

Today's young millennial nursing students are also known as digital natives, representing the first generations to grow up with digital technology (Prensky, 2001). These students have spent their entire lives surrounded by and using computers, videogames, digital music players, video cameras, cell phones, and all the other tools of the digital age. Many are accustomed to rapid sensory stimulation as a result of exposure to these digital tools (Rothgeb, 2008).

Accelerated BSN Programs and Second-Degree Students

While the numbers of the new generation of "Millennial" students are increasing in the traditional BSN programs, the creation of accelerated BSN programs has dramatically brought an increased interest in the nursing profession among "second-degree" students because they offer the quickest route to becoming a registered nurse. Accelerated programs are now offered in 43 states plus the District of Columbia and Puerto Rico (AACN, 2010). In 2007 there were 205 accelerated baccalaureate programs enrolling 9,938 students, a significant increase over the 90 programs available in 2002 (AACN, 2008b). At four-year colleges and universities, new accelerated baccalaureate programs far outpace all other types of new entry-level nursing programs (Raines & Taglaireni, 2008).

The typical second-degree student is motivated, older, and has higher academic expectations than high school entry baccalaureate students (AACN, 2010). They tend to excel in class and are eager to gain clinical experiences. Faculty find them to be excellent learners who are not afraid to challenge their instructors, in fact Vinal and Whitman (1994) reported that these students often give faculty poor evaluations. Rodgers and Healy (2002) warned about the problem of faculty resistance to teaching second-degree nursing students. Anderson (2002) described the problematic relationship between these students and their faculty. The possible problem for this relationship may be due to the fact that the life experiences of second-degree students may be richer than those of faculty. These issues are becoming more relevant as the student population changes and education becomes more focused on students' learning as opposed to how they are taught.

Theoretical Framework

Knowles's Andragogical Theory of Adult Learning

Andragogy, according to Malcolm Knowles (1980), is the "art and science of helping adults learn" (p. 43). Knowles's theory sought to explain the characteristics of adult self-directed learning under the following assumptions: the need to know, the learner's self-concept, the role of the learner's experience, readiness to learn, orientation to learning, and motivation (Knowles, 1984).

The need to for adults to know why they are learning something is the first assumption of Knowles's theory. This assumption states that adults need to understand the relevance of learning before they partake in the learning experience. Adults tend to learn best when information has meaning and when the information can be applied to real-life experiences. Since simulation is intended to mimic real-life experiences, it is essential that students are able to understand the relevance of the simulated activity before they partake in it.

The second assumption refers to the learner's self-concept. It is implied that adults need to be responsible for their own learning and decisions. Since adults need to be self-directed, educators of adult students should attempt to assist learners to be responsible for their own learning. This often involves the transition from dependent to self-directed learners.

The third assumption in Knowles's theory is taking into account the role of the learner's experience. Adult learners present a wide variety of experience and differences, and Knowles (1984) emphasized the need to individualize teaching and learning strategies. Knowles stated, "in any situation in which adults' experience is ignored or devalued they perceive this as not rejecting just their experience, but rejecting them as persons" (p. 58). Using this assumption, for simulation to be an effective teaching strategy it must allow adult learners to connect their prior experience with the information being learned.

Readiness to learn, orientation to learning, and motivation are the fourth, fifth, and sixth assumptions in Knowles's theory. The importance of the timing of the educational experience is critical and adults will have a stronger desire to learn and will choose to learn when they are ready or have a need or interest to learn. In addition, adults tend to be more life oriented when they learn and often are motivated by the internal pressures of life situations, including job satisfaction, quality of life, and self-esteem. In a time of economic crisis and high unemployment rates, adult learners realize that the time to learn is now. Often life pressures are significant motivators for the adult learner.

Since college students are assumed to be adult learners based on their biological age, it is the responsibility of the educator to determine which assumptions are realistic for a learner in a given situation (Knowles, 1984). With the current use of various forms of simulation in nursing education, it is important to determine if simulation is an equitable teaching style for the various types of adult learners.

Constructivism

Constructivism is a theoretical view of learning based on the notion that, by reflecting on our experiences, we develop our own understanding of the world in which we live (Brooks & Brooks, 1999). Learners make sense of experiences based on individual perceptions and thoughts and, in order to learn effectively, the learner must adjust their mental perceptions and models to accommodate new experiences. von Glasserfield (1993, p. 201) stated, “the only world we can know is the world of our experience.”

Constructivism adds to the idea of cognitivism. In cognitivism, the instructor is the giver of knowledge and guides learners to reach the same conclusion. Constructivism permits the instructor to give or present the information but allows the learner to construct their own meaning, therefore, various individual ideas and perceptions of reality (Savoy, 2007). This means that in constructivism information cannot simply be passed from one individual to another. Instead, each individual must process the information. According to Savoy, (2007):

> Constructivism stresses learner inquiry, natural curiosity, engaging in dialogue with other students and the teacher to help provide multiple representations, cooperative learning, real world situations in context, beliefs and attitudes of the learner, and authentic experiences. (para. 6)

There are many different forms of constructivists. This study will discuss the radical constructivist and the social constructivist (Gredler, 2001). The radical constructivists believe knowledge is only in the individual’s head; therefore, the individual must create what he or she knows based on past experiences. Because experiences are subjective there can be no absolutes and we can only know our own subjective reality. The typical radical constructivist classroom uses problem-based learning instead of instructor-led instruction (Gredler, 2001).

The social constructivist, like the radical, believes that knowledge is based on individual experience; however, the social constructivist adds that many, if not most, of the experiences involves social interaction (Gredler, 2001). Students in the social constructivist classroom work in interactive groups and must discuss their thoughts.

This study focuses on the social constructivist philosophy of learning. Because students are not seen as blank slates or empty vessels to be filled with knowledge, prior knowledge and experiences are important to learning (Savoy, 2007). In fact, the social cognition learning model asserts that culture is the prime determinant of individual development. According to Vygostky (1987), students learn differently based on their cultural and historical experiences and their heredity. Past cultural experiences shape the individual and social roles affect the way they learn. Vygotsky's theory of social constructivism explains that students' construction of knowledge and experience is influenced by the cultural context of their historical generation. Hence, students of different generations are likely to know and experience the world in ways unique to their generations. Social constructivism may help educators to understand generational differences in nursing students and how to better meet their learning and motivational differences.

Nursing students are required to use critical thinking skills to solve problems rather than to simply give correct or incorrect answers. Constructivism stresses that the reasoning behind a given answer is necessary to understand why the answer is given. Understanding why a particular response or answer is given will help the learner identify when their thinking is not correct or adequate and why change in thought is necessary.

Using human patient simulation supports a constructivist environment by allowing unusual and unexpected paths in knowledge construction. Constructivists believe that an instructor should simply guide a student rather than force the student to give the correct answer. Simulation allows learners to choose their own paths for learning based on previous knowledge and experiences. Decisions made by the student determine simulation outcomes and students are allowed to struggle with problems, only receiving feedback when absolutely necessary or after the simulation is completed. According to Fosnot (2005), the philosophy of constructivism is highly pertinent to the feedback role that the nurse educator might use in the simulation model and many studies using simulation have used a constructivist approach in the simulation design.

Cognitive Flexibility Theory

Developed in the early 1990’s by Spiro and colleagues, the Cognitive Flexibility Theory (CFT) is a constructivist instructional theory that was designed mainly for ill-structured learning situations, which represent most situations in real life, and complex knowledge areas such as history, medicine, and law (Spiro, Feltovich, Jacobson, & Coulson, 1991). CFT is centered around the following principles: instructions should avoid oversimplification, learning activities must use multiple representations of the content, emphasis should be placed on case-based instruction, advanced knowledge must be acquired in a real-world context, emphasis should be based on knowledge construction rather than simple information transmission, and knowledge sources should be highly interconnected rather than compartmentalized.

Helping learners build their own knowledge and be able to transfer that knowledge into various situations beyond the initial learning experience is the main goal of CFT. In their work, Spiro and colleagues developed an interest in “advance knowledge acquisition,” learning beyond the introductory stage for a subject area, but before the achievement of practiced expertise that comes with massive experience (Spiro, Coulson, & Anderson, 1988). This theory applies to nursing students and the simulation experience in that nursing students have already had introductory exposure to many of the subject areas or clinical areas in nursing school, yet they are certainly not yet experts. The goal of nursing school is advanced knowledge acquisition, and the simulation experience allows for experiences centered on the previously discussed principles of CFT.

Bandura's Social Cognitive Theory

Recognizing that early learning theories did not take into account the principles of observational learning and explicit reinforcement, Bandura began working on his view of social learning theory (Pajares, 2002). In 1986 he published *Social Foundations of Thought and Action: A Social Cognitive Theory* (Parajes, 2002). According to Bandura (1986):

> …people are neither driven by inner forces nor automatically shaped and controlled by external stimuli. Rather, human functioning is explained in terms of a model of triadic reciprocality in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other. (p. 18)

This triad of personal, behavioral, and environmental influences is the foundation for Bandura's conception of reciprocal determinism. Bandura believed that the three influences all work interactively as determinants of each other rather than independently of each other.

Understanding each component of the triad will lead to a better understanding of reciprocal determination. For example, while behavioral theories claim that human functioning is a direct result of external stimuli, Bandura believed that one must first understand how the individual signifies their own psychological processes. Analyzing how the environmental effects influence behavior must be preceded by analyzing how the individual thinks about and interprets those effects.

Social cognitive theory is based on the notion that individuals proactively engage in their own development and are able to make things happen by the actions they take (Pajares, 2002). Individuals possess self-beliefs that allow them to employ a measure of control over their actions, feelings, and thoughts. "What people think, believe, and feel affects how they behave" (Bandura, 1986, p. 25). Also of importance was the fact that humans typically do not live in isolation; therefore, collective agency, the fact that people work together, is a factor. Working together with shared beliefs and aspirations brings a social aspect to Bandura's theory.

Within the social cognitive theory, human behavior is not directly affected by dynamics such as socioeconomic status, economic conditions, education, and family structures. These factors affect human behavior by influencing aspirations, self-efficacy beliefs, emotions, and personal standards. Bandura's social cognitive theory also documents the notion that humans have the means to be influential in creating their own destiny. Capabilities such as symbolizing, planning alternative strategies, learning through vicarious experiences, self-regulating, and self-reflecting are important and will be discussed further.

Being able to symbolize means that an individual can "similarly give meaning, form, and continuance to the experiences they have lived through" (Bandura, 1986, p. 18). These experiences are then stored and may be used to guide future behaviors. Symbolizing an experience contributes to forethought and the ability to plan courses of action, predict what may result from these actions, set goals and challenges, and guide and regulate the activities. Forethought allows an individual to plan an alternative strategy related to a consequence on an action without actually performing the action (Pajares, 2002).

Vicarious learning involves learning by watching the experiences of others. Again, by symbolically coding information learned from observation of others, individuals can often learn and avoid mistakes without actually having to perform an action. If an individual observes another individual experience desired results, the first individual will symbolize the experience as positive and may opt to take up the behavior and duplicate it in the future.

Because individuals do not usually perform a behavior merely to appease others, much of human behavior is motivated and regulated by standards from within the individual. Selfregulation, through self-observation and self-monitoring, enables an individual to make judgments about their own actions and choices. Being able to analyze these judgments, actions, and choices is the process of self-reflection. For Bandura (1986), self-reflection is a characteristic that is unique to humans and allows for reflection of themselves, their capabilities, and on experiences allowing for the development of new knowledge regarding oneself and the world around them.

Self-Efficacy

Social cognitive theory looks at human functioning and, at the heart of human functioning are self-efficacy beliefs. Bandura (1986) defines perceived self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). This does not mean that the individual is judging their skills, but what they can do with the skills they possess. Two individuals who possess similar skills may perform differently based on perceived self-efficacy. In addition, the same person may perform very differently on the same task on different occasions based on their perceived self-efficacy at the time the task was completed. In order to function competently, one must possess not only skills but the self-beliefs of efficacy to use those skills.

Self-efficacy is often used to describe one's general sense of competence and effectiveness (Smith, 1989). The terms self-efficacy and self-confidence are often used interchangeably. Bandura (1997), however, argues that the term self-efficacy differs from confidence in that confidence is a non-specific term that refers to a belief but does not specify what the belief is about. Self-efficacy refers to a belief about one's capabilities related to a specific goal.

According to Maddux (1995), self-efficacy is most useful when it is “defined, operationalized, and measured to a behavior or set of behaviors in a specific context (p. 8). Many generalized self-efficacy scales have been developed but research indicates that these scales have not yielded much data on specific types of behavior change (Tipton & Worthingon, 1984); therefore, scales for specific behavior types must be developed or general self-efficacy scales must be adapted to specific behavior types to be measured.

It is important to differentiate between self-efficacy and outcome expectations. Self-efficacy is a judgment that involves the evaluation of one’s capability to accomplish a certain standard of performance. Outcome expectation involves what the individual believes will happen as a result of a behavior. For example, an individual may believe that he or she can do well on an exam; that is self-efficacy. However, the fact that the individual may expect high praise from instructors and an increased grade point average describe the outcome expectations. In addition, individuals may believe an outcome expectation is desirable but fail to execute the action simply because they feel that they are not capable of doing so.

According to Pajares (2002), there is much empirical evidence to support Bandura’s contention that self-efficacy beliefs are evident in nearly every area of human functioning. In fact, Bandura (1997) contends, “people’s level of motivation, affective states, and actions are based more on what they believe than on what is objectively true” (p. 2). In the previous example, a student may possess the knowledge and skills to do well on an exam but fail to believe that they are capable of doing so. It is possible that this student will fail to perform to their maximum capability simply because of the belief that they are less than capable. This phenomenon can work in the opposite way as well. Here is another example. If a student believes that he can do surgery on a patient, yet is fairly new to medical school and has no surgical skills, fatal consequences may result from his belief that he possesses the capability to perform surgery and follows through with the action of performing the surgery. It should be noted that self-efficacy beliefs are very important factors in how well knowledge and skills are obtained in the first place.

Self-efficacy is not only an individual concept. Individuals work together as groups, making efficacy a social construct as well. When individuals work together in a group, a sense of collective efficacy develops. Collective efficacy is a group's common belief in its capability to attain goals and carry out desired tasks (Pajares, 2002).

Self-Efficacy versus Self-Esteem

It is not uncommon to hear the terms self-efficacy and self-esteem used interchangeably. Many believe that these two concepts mean the same thing when they actually represent two entirely different ideas. As previously discussed, self-efficacy is concerned with the judgments of personal capability regarding knowledge and skills. Self-esteem, on the other hand, is primarily concerned with judgments of self-worth (Bandura, 1997). Maddux (1995) considered self-concept in relation to self-esteem:

> …self-concept - the sum total of beliefs about the self, or self-esteem - the sum total of the evaluation of these beliefs, how one feels about these beliefs and oneself, or one's assessment of one's worth or value as a person. (p. 8)

Bandura (1994) notes that no predetermined correlation between beliefs about one's capabilities and whether one likes or dislikes oneself has been identified. For example, if an individual claims low self-efficacy in salsa dancing it may not lower their self-esteem if they have no interest at all in salsa dancing. Conversely, a person may feel highly self-efficacious about an activity but develop low self-esteem from engaging in the activity. Take into consideration a dogcatcher who is very skilled at catching stray dogs. His self-efficacy regarding being able to catch any stray dog may be positive; however, knowing that he has to deliver them to the animal shelter where they may not find a home may lower his self-esteem.

Another distinguishing factor between self-efficacy and self-esteem is that in ongoing pursuits, perceived personal efficacy forecasts goals and performance attainments that people set for themselves. Self-esteem does not affect personal goals or performance goals (Mone, Baker, & Jeffries, 1995).

Literature Related to Self-Efficacy and Simulation

Linking Theory and Practice

Traditionally, nursing curriculum has been a combination of didactic theory and clinical practice. According to Childs and Seeples (2006):

> …during the course of their education, students are expected to acquire knowledge, incorporate critical thinking and psychomotor skills, develop self-confidence in their abilities, and then transfer this knowledge to the clinical setting where they have the opportunity to care for patients. (p. 154)

Despite efforts to prepare nurses to provide safe and effective care, a significant gap exists between theories taught in the classroom and realities practiced in the clinical setting (Henneman & Cunningham, 2005).

Simulation has been used in nursing curriculum since the 1950s (Peteani, 2004). Originally developed to serve as a teaching aid for clinical skill acquisition, simulation has established its place in nursing education. Many early simulation experiences included practicing injections using a piece of fruit, inserting Foley catheters using a model, and enhancing CPR skills using a mannequin (Ward-Smith, 2008).

Nurse educators realize that as technology changes, creating, thinking, and planning of instruction must change with the technology (Tyler, 2004). Simulation now allows for more than skill acquisition. Current simulators along with corresponding computer programs engage students in learning through simulation of physiologic events. Used as an adjunct to the clinical experience, Hanberg and Brown (2006) reported that high-fidelity simulation may be the missing link between knowing the theory taught in the classroom setting and performing the skills in a real-life situation. Gaba (1992) believes that the most beneficial aspect of simulation is in its ability to present crisis scenarios with no human risk. It is through research that this idea may be addressed.

Self-Efficacy Related to Academic and Task Performance

According to Dewey, an effective educational experience occurs when an individual with an active mind interacts with the world to solve actual problems that relate to but are still different from previous experiences (Reed & Johnson, 2000). Simulation provides opportunities for active participation and, according to Tomey (2003), students learn best through exercises that require active participation.

According to Reed and Johnson (2000), Aristotle believed that “every acorn has the potential to be actualized as a giant oak tree” (p. 17). A wide variety of factors may help determine whether or not acorns fulfill their potential. Bandura’s social cognitive theory discusses the notion that humans have the means to be influential in creating their own destiny (Bandura, 1997). Bandura (1997) discovered that an individual’s perceived levels of efficacy play a major role in the amount of effort the individual will utilize on a task and the degree to which the individual persists in the face of complications:

People’s beliefs in their efficacy have diverse effects. Such beliefs influence the

> courses of action people choose to pursue, how much effort they put forth in given endeavors, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishment they realize. (p. 3)

Students who have low levels of perceived efficacy are unlikely to persist when they are faced with obstacles (Bandura, 1986). Those with a resilient sense of efficacy tend to view difficult tasks as challenges to be overcome instead of problems to be avoided.

Relating self-efficacy to academic performance in nursing, Laschinger (1996) found that when students come across difficulties in their program, those with higher self-efficacy beliefs made more effort to overcome the obstacles and persisted longer than those who doubted their capabilities. Harvey and McMurray (1994) discovered that students with lower academic self-efficacy were more likely to withdraw from a nursing program when compared to those with higher academic self-efficacy.

For as long as academic performance has been evaluated, there have been studies to determine what, if anything, affects it. New ways to improve student outcomes are continuously being sought. Limited research has been done to determine what effect simulation has on student self-efficacy (Rockstraw, 2006). Numerous studies, however, have indicated that students with low self-efficacy are at a higher risk for poor academic performance than are those with adequate or high levels of perceived efficacy (Andrew, 1998; House, 2006; Kalm & Naura, 2001; Lent, Brown, & Larkin, 1986, 1987; Vrugt, Langereis, & Hoogsraten, 1997). In addition, studies have shown that self-efficacy is a significant predictor of a student's final grades (McLaughlin, Moutray, & Muldoon, 2007). With this in mind, one goal of the present study is to investigate further how simulation affects self-efficacy and task performance.

Self-Efficacy in Real-Life Situations

In the late 1600s, John Locke wrote *Some Thoughts Concerning Education*. In his writings, Locke noted four things important to education: virtue, wisdom, breeding, and learning (Locke, 2000). While reading and writing were indeed important to Locke, he warned that a scholar must first be virtuous and wise. He urged parents to seek out tutors who teach knowledge but also to teach manners, good habits, and civility (Reed & Johnson, 2000). Dewey believed that school is primarily a social institution and education is a social process (Reed & Johnson, 2000). School should represent present life in relation to the student, and the student should be able to gradually learn from activities and relate them to his or her own world. While Locke wrote about education over 300 years ago and Dewey was specifically talking about children in his writings, these writings are still valuable and pertain not only to children but to learners in post-secondary institutions as well, especially nursing students.

Nursing is a profession deeply embedded in ethics, virtues, good habits, and civility. Chan (2006) found that students with greater perceived self-efficacy indicated they felt they demonstrated greater strengths in social skills, utilization of emotions, and in practical abilities. White (2003) found that graduates who believe themselves to be better prepared are better able to care for their patients and will make an easier transition into the workforce. Since studies have shown a direct relationship between confidence in the clinical setting and job satisfaction, it is imperative that nursing schools employ measures to produce graduates who are better prepared to meet the demands of real-life clinical situations (Meretoja, Leino-Kilpi, & Kaira, 2004).

Literature Related to Simulation

Simulation as Alternative Instruction

Nursing education throughout history has relied on clinical placements and real patients as the primary means by which clinical skills have been taught. As educators study more about students' individual learning styles and preferences, it is essential to explore alternative measures to clinical instruction.

However institutions are faced with insufficient numbers of faculty. Clinical resources are becoming scarce due to healthcare reimbursement efforts to reduce acute care admissions and lengths of stay. New strategies are being considered to educate professional nurses to assume increasingly complex roles that require higher levels of critical thinking. In 2003, the National League for Nursing (NLN) declared that nurse educators must provide "learning environments that facilitate students' critical thinking, self-reflection" and prepare "graduates for practice in a complex, dynamic health care environment" (pp.1–2).

Nursing students today are changing as technology changes. Educators must adapt teaching styles to fit this new generation of learners. Simulation is an innovative teaching and learning tool that may fit into the rapidly changing world of nursing education.

Used as an alternative method of instruction, simulation in nursing education attempts to address the gap that occurs as a result of increased enrollment, decreasing and competitive clinical times, shorter hospital stays, increased patient acuity during hospital stays, and the need for students to practice providing care that is complex and requires a high level of skill (Rhodes & Curran, 2005). According to Ward-Smith (2008), teaching skills in the clinical setting may not always provide the best atmosphere for learning because not being proficient in the skills necessary to function in a clinical setting can make the clinical experience less satisfying to the student. The simulation experience allows the student to remediate and practice skills, therefore increasing confidence, before entering the clinical setting.

Results of a 2004 study by Feingold, Calaluce, and Kallen indicated that while all the surveyed faculty members believed that the simulated learning would transfer with the students into the clinical setting, only slightly over half of the surveyed students believed that working with the simulators increased their confidence, clinical competence, and prepared them to work in real clinical settings. In addition, faculty commented on how much extra time and resources it took to implement simulation.

Ravert (2004) suggests that simulation "should help students learn necessary cognitive and psychomotor skills and allow them to develop the confidence or self-efficacy needed to perform appropriate and correct nursing actions when similar conditions in real patients are encountered" (p. 2). Gaba (2004) found that the ability to provide real-time human physiology and responses using a manikin that mimics reality provided a higher level of learning for the student. By relating simulation activities to real-life situations that the student may have already encountered or will encounter in the clinical setting and in life in general, students build necessary skills to handle situations as they arise.

Simulation and Self-Efficacy

Bandura (2006) describes measuring self-efficacy in degrees of confidence. Often self-efficacy surveys ask subjects to "rate your degree of confidence by recording a number…" (Bandura, 2006, p. 312). Nursing students often report lack of self-confidence and apprehension when they are expected to meet performance criteria (White, 2003). In nursing, developing confidence as a nurse can influence clinical decision-making (White, 2003). Because self-efficacy is directly related to self-confidence, self-efficacy, like self-confidence is essential to nurses' ability and performance in the clinical setting.

Over 400 articles have been published in nursing journals related to self-efficacy and confidence (Leigh, 2008). Most of the research, however, has been focused on clients with chronic health problems and participation in health-promoting activities (Resnick, 2004). In recent years, research has begun to focus on various methods of teaching that develop students' self-efficacy and confidence. Using methods other than traditional lecture have been shown to increase self-efficacy and/or confidence of nursing students (Leigh, 2008). These methods include working with preceptors, internships, computer assisted instruction, simulations, and online videos (Alinier, Gordon, Harwood, & Hunt, 2006; Bland & Sutton, 2006; White, 2007). Yet, with all of the research, the most effective teaching method to improve self-efficacy has not been established. In fact, some studies have shown no significant difference in students' self-efficacy when comparing methods such as online video clips and intermediate fidelity simulation with traditional methods such as lecture (Alinier et al., 2006; McConville & Lane, 2006).

For any type of teaching method to be effective, students must perceive it as beneficial and of value. Research has been done on various types of simulation activities related to student self-efficacy. In one study, third year baccalaureate students participated in case studies where role-playing was done. Students played characters such as nurse, client, family member, observer, or coach and assumed different roles in different cases (Goldenberg, Andrusyszyn, & Iwasiw, 2005). Students were questioned about their perception of their confidence related to health teaching prior to and after the simulation experience. Overall, students reported higher levels of confidence related to health teaching after the simulated experience and more than half of the students rated the simulation experience as effective.

Another study done using role-playing involved nursing students and postpartum teaching. Students were given the opportunity review materials such as textbooks, websites, a lactation consultant, various pieces of equipment, including baby dolls and blankets, and videos related to postpartum teaching (Wagner, Bear, & Sander, 2009). The simulation exercise involved students interacting with faculty members playing the roles of newly postpartum mothers. Students were asked to interact with the faculty and provide postpartum teaching. After the exercise, students were debriefed and given feedback. When asked about how the simulation experience, students strongly agreed the experience increased their confidence in nursing abilities.

Some studies have been done using a combination of didactic instruction and simulation experiences. Jeffries (2001) compared satisfaction levels in students given a traditional lecture versus those given an interactive CD demonstrating oral medication administration techniques and found greater levels of satisfaction in students who were exposed to the interactive CD versus those exposed to lecture. Another study by Sinclair and Ferguson (2009), sampled 250 students enrolled in the second year of a baccalaureate nursing program. The control group received two hour lectures on five topics while the intervention group received one hour lectures and one hour simulation scenario experiences using mannequins and role playing for the same topics. Over 90% of the students in the intervention group found the activity to be effective while only 68% of the control group found the activity effective. Students involved in the combined lecture/simulation experience reported greater levels of clinical confidence while students in the control group requested more interaction and interactive activities with hands-on learning.

Human patient simulation or high-fidelity simulation is of maximum benefit when the participant perceives it as legitimate, authentic, and realistic (Childs & Sepples, 2006; Jefferies &

Rizzolo, 2006). The Singapore Institute of Technical Education conducted a study of 234 first year nursing students who had completed year one of their two year education without exposure to simulation based training (Kiat, Mei, Nagammal, & Jonnie, 2007). At the beginning of their second year, students were exposed to 20 hours of simulation training over a period of six months. Results of the study indicated that an overwhelming majority of the students viewed simulation as a learning approach with many benefits such as being an enjoyable way to learn, allowing them to analyze patient conditions and think on their feet, allowing them to realize areas where they needed to improve, increasing their confidence, and allowing them to make mistakes without causing harm to real patients.

Many nursing students say that they learn best when they actually perform something on a real patient, which indicates that most students prefer experiential learning (Medley & Horne, 2005). According to Lamb (2007), students' clinical confidence can increase with simulator experiences as they practice skills before actually working with patients. Participation in a human patient simulation experience allows for the most realistic hands-on practice outside of the actual clinical setting. Numerous studies show that self-efficacy in nursing students increases after participation in human patient simulation HPS (Bantz, Dancer, Hodson-Carlton, & Van Hove, 2007; Bremner, Aduddell, Bennett, & VanGeest, 2006; Eaves & Flagg, 2001; Henneman & Cunningham, 2005; Kuznar, 2007; Lasater, 2007; Leigh, 2008; McCausland, Curran, & Cataldi, Reilly & Spratt, 2007).

When comparing various types of simulation, studies have shown that students participating in high-fidelity simulation and static mannequin simulation demonstrated a higher increase in levels of self-confidence than the students who completed written case studies (Jefferies & Rizzolo, 2006). According to Smith (2009), after the integration of simulation into a senior-level course, faculty learned that their students were intrigued by real-life, real-time scenarios and noted that using simulation as an adjunct to acute care clinical assignments promoted confidence and comfort. Students reported increased confidence when working with patients after participating in a simulation experience.

One qualitative study done by Bambini, Washburn, and Perkins (2009) found that after participating in an obstetrics human patient simulation experience, students reported increased confidence in what to expect and how to function in a clinical setting. Additional data analysis reported that clinical simulation experiences can be effective in increasing student self-efficacy related to the performance of clinical skills. Specific student comments stated that they felt better prepared to solve problems when faced with similar situations and felt the simulation experience was enjoyable and effective in preparing them for the clinical setting.

It should be noted that not all research studies reveal results of increased confidence levels after the human patient simulator experience. In one study by Brannan, White, and Bezanson (2008), medical-surgical students were divided into two groups. One group was given the traditional lecture related to treatment of a myocardial infarction, while the other group was given a simulation experience. The researchers hypothesized that the students who received instruction with the HPS method would demonstrate greater levels of cognitive skills and confidence in their ability to care for patients compared to those who received traditional classroom instruction. The findings revealed that while the HPS group did demonstrate greater levels of cognitive abilities, their confidence levels were not significantly different from those who received the traditional lecture.

Costs of Virtual Clinical Excursions and Human Patient Simulators

Experiential learning outside the clinical setting may take place with various types of simulation activities (e.g., the HPS, models of specific body parts, computer-based simulation, case studies, role playing) (Brannan, White, & Bezanson, 2008). According to Jeffries (2007), simulation types of activities continue to provide benefits depending on the objectives and cost constraints of the institution. With budget cuts significantly impacting nursing institutions, significant documentation regarding outcomes of simulation experiences is necessary to justify their costs. Costs of two very different simulation experiences, the virtual clinical excursion and the human patient simulation, are discussed.

Virtual clinical excursions, a form of low-fidelity computer-based simulations, are significantly less expensive than high-fidelity human patient simulation. Instead of purchasing expensive, high-fidelity simulation equipment, students purchase simulation workbooks that contain software and web-based simulation experiences. Simulation scenarios can be done on personal computers and/or in computer labs within the educational setting. Often these workbooks accompany textbooks used within the nursing curriculum. The average cost of this workbook is between $60 and $100.

High-fidelity simulation labs, when compared to computer-based simulations, can be very expensive when one considers the costs of manikins, creating and/or remodeling rooms for simulation labs, equipment, computers, faculty training, technology staff, etcetera. Many simulation labs contain high tech computer equipment, sound equipment, and video recording equipment as well (Rothgeb, 2008). Costs to implement and maintain a high-fidelity simulation lab are estimated to range from $200,000 to $1.6 million (Eaves & Flagg, 2001; Hravnak, Tuite, & Baldisseri, 2005).

Students in high-fidelity simulation laboratory often participate in simulation scenarios that are comparable to the scenarios of the virtual clinical excursion. While high-fidelity simulators offer actual breath sounds, heart sounds, palpable pulses, and intravenous access, students participating in virtual clinical excursion are limited to the capabilities of a desktop or laptop computer. The main difference in the two types of simulation is that in the simulation laboratory, students actually work hands-on with a simulated patient and are able to think critically, make decisions, and “act out” their responses. In the computer-based simulation experience, students must think critically and make decision as well but it is done in a computer lab setting with no interaction with human patient simulators.

While the diversity and number of students expected to continue to increase, institutions are being asked to become more financially efficient and more accountable for educational outcomes (Marcey, 2004). During a time of financial cutbacks and budget restrictions in nursing education, it is essential to examine the costs of the simulation laboratories that make simulation experiences possible. With the various types of simulation available, implementation costs compared to educational benefits must be considered.

Although much research has been done on patient simulators and clinical training, very little literature can be found related to simulator costs and little information is documented about the cost effectiveness and cost benefits of human patient simulation. In 2007, Harlow and Sportsman studied the economic viability of the use of a patient simulation center as an alternative to skills lab instruction for preparation of nursing students. Their goal was to determine if there were sufficient cash savings from the use of human patient simulators to offset the costs that were associated with purchasing equipment and setting up the simulation lab. Results of their study indicated that while there are substantial savings in instructional costs that occur as a result of the use of simulation laboratories, the savings are not sufficient to offset the investment costs. The authors suggested that with this type of data that additional research needs to be done on the effects of using patient simulators for nursing education on patient outcomes.

In another study, nursing students were taught advanced cardiac life support using either static mannequins or the human patient simulator (Hodley, 2009). While both groups demonstrated significant gains in knowledge on the posttest, the human patient simulator group did not score significantly higher than the control group. In addition, the human patient simulation teaching methods did not produce higher skill scores, satisfaction with simulation design features, or satisfaction with the learning experiences, which promoted self-confidence in performing resuscitation techniques. Again, this author suggested more research with more participants, using qualitative data, and further analysis of costs.

Summary

Limited literature exists discussing the changing demographics of the nursing student population. A short discussion of the three generations of nursing students, baby boomers, generation X, and generation Y, helps the reader understand how different generations of students differ and the challenges faced by faculty to provide beneficial and equitable learning activities to these populations. Second-degree students are further explored since this group of students presents a very different nursing population yet they span across multiple generations and may provide educational challenges for equitable learning opportunities.

To understand how self-efficacy and simulation are related and how they are important in nursing education, it is important to begin by fully understanding the theoretical framework chosen for this study. Due to the various levels of this research, multiple theoretical perspectives were explored. Constructivism, the notion that by reflecting on our experiences we develop our own understanding of the world in which we live (Brooks & Brooks, 1999), begins to lay the groundwork for the simulation experience because the simulation experience allows the student to experience unusual paths in knowledge construction and allows them to reflect on their previous life experiences to understand the clinical environment. Cognitive Flexibility Theory adds that learners should build upon their own knowledge and be able to transfer that knowledge into various situations beyond the initial learning experience (Spiro, Coulson, & Anderson, 1988).

Social cognitive theory moves away from simple knowledge and begins to look at how individuals proactively engage in their own development and how they make things happen by the actions they take (Pajares, 2002). To help tie constructivism, cognitive flexibility theory, and social cognitive theory to this particular research study, Knowles's andragogical theory of learning described assumptions made to explain the self-directed adult learner.

At the heart of the idea of human functioning, is the concept of self-efficacy. Bandura (1986) defines self-efficacy as simply "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). Self-efficacy should not be confused with self-esteem, as self-esteem is concerned with judgment of self-worth.

This chapter then moves into literature pertaining to simulation and self-efficacy. It begins by discussing the idea of how simulation links nursing theory with nursing practice. Next, self-efficacy as it relates to academic and task performance and real-life situations is discussed. Numerous studies were cited that revealed students with higher levels of self-efficacy performed better on tasks, academically, and felt better prepared to transition into the workforce than those with lower levels of self-efficacy. With pressure being placed on nursing schools to increase retention, graduation rates, and NCLEX pass rates, this is an important finding.

As simulation begins to be discussed in detail, the idea of simulation as an alternative instructional method is presented. As schools are faced with the challenges of producing more, capable graduates, a variety of teaching methods must be introduced into the curriculum so that each learner has a chance to be engaged. As simulation is being introduced more frequently in nursing curricula, the idea of how simulation affects student outcomes and self-efficacy has become increasingly researched. The next section focused on simulation as it related directly to self-efficacy. Studies that resulted in increased self-efficacy after simulation and studies that did not result in increased self-efficacy after simulation are reviewed along with literature pertaining to the various types of simulation as they relate to self-efficacy.

This chapter concluded with a brief overview of the costs of the two types of simulation that were used in this study. The virtual clinical excursion, a relatively inexpensive simulation method, and the human patient simulation, a fairly costly simulation method were discussed. Because budget cuts are becoming more widespread in nursing schools, it is essential to understand the costs versus the benefits of simulated experiences.

CHAPTER 3

METHODOLOGY

Based on the demographic cultural factors of generational type and previous education this study investigated motivational differences in teaching strategies regarding intrinsic motivation and self-efficacy. More specifically, this quantitative study was designed to evaluate and compare the differences in pre-simulation/post-simulation/post-clinical self-efficacy and post-simulation intrinsic motivation scores of junior II nursing students enrolled in Health Promotion of Adults, NURS 3211, in the baccalaureate program at a university in Southern Georgia. Students were randomly selected to participate in one of two simulation methods, virtual clinical excursion (VCE) or human patient simulation (HPS).

Research Questions

1. Based on the demographic cultural factors of generational type and previous degree, to what extent, if any, do post-simulation intrinsic motivation scores differ between students exposed to virtual clinical excursion (VCE) and human patient simulation (HPS)?
2. Based on the demographic cultural factors of generational type and previous degree, to what extent, if any, do nursing pre-simulation, post-simulation, and post-clinical self-efficacy scores differ between students exposed to virtual clinical excursion (VCE) and human patient simulation (HPS)?

Research Design

Due to the timing of a new simulation program at the chosen site, data for this study was previously collected by the researcher using faculty status at the site. The researcher obtained

IRB approval at the institution prior to the beginning of data collection. For the purposes of this study, the previously collected data will be analyzed to answer the research questions.

This study used both within-group and between-group experimental designs. Both designs are based on pre- and post-test group measures. The independent variables are the two virtual simulation experiences and the hospital clinical rotation. The dependent variables are the measures of self-efficacy and intrinsic motivation.

Participants

Site Selection

The chosen site is a regional university in Southern Georgia. It offers undergraduate work leading to the following degrees: Associate of Applied Science in five major programs, the Associate of Arts, the Bachelor of Arts in 13 major programs, the Bachelor of Science in 12 major programs, the Bachelor of Science in Education in 8 major programs, the Bachelor of Business Administration in five major programs, the Bachelor of Fine Arts in seven major programs, the Bachelor of Music in two major programs, the Bachelor of General Studies, the Bachelor of Science in Nursing, the Bachelor of Science in Exercise Physiology, and the Bachelor of Applied Science.

Graduate degrees offered include the Master of Education in 12 major programs, the Master of Arts in two major programs, Master of Arts in Teaching, the Master of Science in five major programs, Master of Public Administration, Master of Business Administration, Master of Science in Nursing, Master of Music Education, Master of Music Performance, Master of Social Work, Master of Library and Information Science, the Education Specialist in nine major programs, and the Doctor of Education in three major programs, and the Doctor in Public

Administration. New baccalaureate and graduate degree programs are added from time to time to meet the needs of the population served by the University.

The School of Nursing was established in 1967 and graduated its first Bachelor of Science in Nursing (BSN) class in 1972. The RN to BSN program was initiated in 1979 and graduated the first graduates in 1981. The Master of Science in Nursing degree program was initiated and the first students were admitted in 1983. In 1994-1995 technology grants brought computers and instructional software to the School, federal training grants were obtained to provide funds for graduate students, and distance learning classes for the RN to BSN students were started in five locations in South Georgia. In addition, the nurse practitioner program was initiated. In 2005, in response to state initiative for nurses, the accelerated BSN program was implemented for students who already possess a previous bachelor’s degree.

In 1993, the college became a University, and, in 1994, the School of Nursing became a College. The College of Nursing is nationally accredited by the Commission on Collegiate Nursing Education (CCNE) until 2021. Undergraduate students seeking a BSN degree are admitted to the College of Nursing three times a year, during the spring, summer, and fall terms.

In Fall 2004, the College of Nursing purchased its first Human Patient Simulator (HPS) after a faculty member attended a simulation conference in 2002. After reviewing the literature available on simulation he convinced other faculty within the College of Nursing to collaborate to set up a simulation laboratory. An initial grant submitted in 2002 for funding of a simulation laboratory was denied. A subsequent grant, written in 2003, was also denied. Upon the arrival of a new dean, a final grant was written and finally funded in 2004 by the University System of Georgia.

The adult HPS became part of clinical makeup exercises in Spring 2005 and in Summer 2005; VSU received two more simulators, the pediatric HPS and a lower fidelity adult human patient simulator. In 2006, the school purchased pre-written patient scenarios and began sending faculty to specific HPS training. With the aid of a technology grant from the University System of Georgia, video equipment, laboratory renovations, and a ventilator were purchased. In 2007, the simulation laboratory was used for post clinical evaluation and as a preclinical readiness tool. Occasionally the simulation laboratory was used to support classroom teaching activities such as ventilator use and cardiac dysrhythmias.

As clinical outsourcing sites became more and more difficult to obtain locally, the simulation laboratory officially became a source for clinical outsourcing in 2009. Nursing students at the junior and senior level were scheduled for adult health clinical experiences 2-3 times per semester. As pediatric clinical experiences decrease, the pediatric HPS began to substitute for in-hospital pediatric rotations.

Currently, the college houses two human patient simulation laboratories, which allow students to rotate through and experience clinical simulations in a safe environment. All baccalaureate students have a least one rotation through the simulation laboratory as a clinical outsource. Many students get both pediatric and adult simulations. In 2010, a collaboration between the psychology department and the nursing department marked the first interdisciplinary nursing and psychiatric simulation activity.

The availability of the students as participants and the ability to utilize the human patient simulation laboratory for the human patient simulation (HPS) intervention as well a dedicated student computer laboratory for virtual clinical excursions (VCE) made this site an optimal research environment. Participants were chosen based on their enrollment in the NURS 3212 course and the simulation lab was available at the time the course was scheduled to meet.

Sample Selection

The population for this study was baccalaureate nursing students enrolled in Health Promotion of Adults, NURS 3211. This course is offered during the Spring and Fall terms of the academic year, during the junior II semester of nursing school and is the first course that allows student clinical rotations on a medical/surgical nursing floor in a hospital setting.

Each semester, junior II students were randomly divided into two simulation groups. Each group consisted of between 12-15 students, depending on enrollment each term. Students were either enrolled in the traditional two-year BSN program or the accelerated, second-degree BSN program.

A total of 126 students participated in this study. Demographic information is as follows:

Student sex:

Male – 20 (15.9%)
Female – 105 (83.3%)
Unknown – 1 (0.8%)

Generation:

Baby Boomer (48-65 yrs old) – 2 (1.6%)
Generation X (27-47 yrs old) – 23 (18.3%)
Generation Y (26 yrs old and under) – 97 (77%)
Unknown – 4 (3.2%)

Marital Status:

Single – 94 (74.6%)
Married – 28 (22.2%)
Divorced – 3 (2.4%)
Unknown – 1 (0.8%)

Employment Status:
Full time – 10 (7.9%)

Part time – 40 (31.7%)
Not employed – 75 (59.5%)
Unknown – 1 (0.8%)

Degree:
No degree – 78 (61.9%)
Associates – 16 (12.7%)
Bachelors – 26 (20.6)
Technical – 2 (1.6%)
Associates and technical – 1 (0.8%)
Bachelors and masters – 1 (0.8%)
Post masters – 1 (0.8%)
Unknown – 1 (0.8%)

Previous Experience with Simulation:
Yes – 111 (88.1%)
No – 12 (9.5%)
Unknown – 3 (2.4%)

Previous Experience with HPS:
No experience – 97 (77%)
1-4 hours – 7 (5.6%)
5-10 hours – 8 (6.3%)
10+ hours – 13 (10.3%)
Unknown – 1 (0.8%)

Previous Experience with VCE:
No experience – 59 (46.8%)
1-10 hours – 40 (31.7%)
11-20 hours – 20 (15.9%)
21-30 hours – 3 (2.4%)
31+ hours – 2 (1.6%)
No hours indicated – 1 (0.8%)
Unknown – 1 (0.8%)

Previous Clinical Rotations in the Hospital on a Medical/Surgical Floor
Yes – 16 (12.7%)
No – 108 (85.7%)
Unknown – 2 (1.6%)

Simulation Group:
HPS – 53 (42%)
VCE – 72 (57.1%)
Unknown – 1 (0.8%)

Interventions

VCE experiences took place in a dedicated computer lab. Students worked in pairs to complete the computer-based simulation experience. Each group was given one hour to complete the simulation. HPS experiences took place in a dedicated simulation laboratory with a human patient simulator. Students worked in pairs and were given one hour to complete the simulation activity. Both simulation groups worked on a simulation activity dealing with fluid and electrolyte imbalance.

Instrumentation

An author developed demographic data survey and two instruments were used for this study. The instruments consist of the *Intrinsic Motivation Inventory* (IMI) developed in 1982 by Ryan and his colleagues from the Rochester Motivation Research Group (Plant & Ryan, 1985; Ryan, Mims, & Koestner, 1983) and an adapted version of the *General Self-Efficacy* (GSE) scale developed by Schwarzer and Jerusalem (1995) in 1979 and later adapted in 1992.

General Self-Efficacy Scale

The 20 item, German version of the *General Self-Efficacy Scale* (GSE) was developed and used by Schwarzer and Jerusalem in 1979. In 1992, it was adapted to a 10-item scale (Schwarzer & Jerusalem, 1995). Designed for general adult populations, including adolescents, the scale has been translated into 26 other language and has been used in numerous published studies (Schwarzer & Jerusalem, 1995; Rimm & Jerusalem, 1999; Schwarzer & Scholz, 2000). The GSE, as a general measure, does not draw on specific behavior change. Therefore, in most applications, it is necessary to add a few items to cover the particular content of the survey or intervention (Schwarzer & Fuchs, 1996). Since the intent of the GSE is to evaluate a general sense of perceived self-efficacy with a goal of predicting ability to cope with daily hassles and adaptation after experiencing stressful life events (Michael, 2005) permission via electronic communication was received to use and adapt the General Self-Efficacy Scale for the purposes of this research from Ralph Schwarzer, co-author of the tool (Appendix I) and the GSE was modified to evaluate a general sense of perceived self-efficacy related to a specific nursing student event. Existing student clinical objectives and goals for satisfactory performance on a medical/surgical nursing floor in NURS 3211 replaced the generic self-efficacy content on the GSE. Because perceived self-efficacy reflects an optimistic self-belief, the foundation for any question related to self-efficacy is the "I can" idea (Schwarzer & Fuchs, 1996). In the following examples of original GSE questions versus revised GSE questions for this study, note that each question links "I can" to a specific objective:

Original GSE Question: *I can* always manage to solve difficult problems if I try hard enough.

Revised GSE Question: *I can* provide a safe environment for the implementation of the planned nursing care.

Original GSE Question: If someone opposes me, *I can* find the ways and means to get what I want.

Revised GSE Question: *I can* analyze the assessment data to formulate appropriate nursing diagnoses.

The GSE was designed for the general adult population, including adolescents (Schwarzer & Fuchs, 1996); therefore it is an appropriate instrument for a nursing student population. Criterion-related validity is documented in numerous correlation studies where positive coefficients were found with favorable emotions, dispositional optimism, and work satisfaction (Schwarzer & Jerusalem, 1995). For the current study, criterion-related validity is based on clinical objectives and goals established for NURS 3211. These objectives and goals are currently used to measure student performance in the medical-surgical clinical setting.

Reliability on the GSE has been documented in the literature numerous times. The GSE is one-dimensional and has been used in samples from 25 nations. Reliability measures from these samples using Chronbach's alphas ranged from 0.75 to 0.91 with the majority ranging in the high 0.80 range (Scholz, Gutierrez-Dona, Sud, & Schwarzer, 2002). Since the GSE was modified for this study, Chonbach's alpha was performed on all the GSE using the data from all three attempts: prior to simulation, after simulation, and after a clinical rotation to determine the instrument's reliability in its modified form. Reliability was determined as follows: prior to simulation = 0.91, after simulation = 0.939, after a clinical rotation = 0.927, and all three attempts combined = 0.948, above the recommended 0.80 for and aligning well with the reliability measure range noted for the original GSE.

Intrinsic Motivation Inventory

The Intrinsic Motivation Inventory (IMI) was developed in 1982 by Ryan and his colleagues from the Rochester Motivation Research Group (Plant & Ryan, 1985; Ryan, Mims, & Koestner, 1983). Basing intrinsic motivation on the underlying subsections of interest-enjoyment, perceived competence, effort, pressure-tension, perceived choice, value-usefulness, and relatedness, the IMI is a 45 item, Lickert-scale instrument that is easily modifiable to fit a wide variety of activities (McAuley, Duncan, & Tammen, 1989).

Rarely are all of the subscales given in a particular instrument and often researchers choose the subscales that are relevant to the studies they are conducting. "Past research suggests that order effects of item presentation appear to be negligible, and the inclusion or exclusion of specific subscales appears to have no impact on the others" (University of Rochester, Psychology

Dept, n.d.). Since the interest-enjoyment subscale is noted as the self-report measure of intrinsic motivation, it was used along with the perceived competence, effort-importance, pressure-tension, and value-usefulness subscales. Relatedness relates to ones thoughts and feelings regarding another person who participated in the experiment. Since this concept is not relevant to this study, the relatedness subscale was not administered.

The IMI has been used in a variety of settings such as reading, learning, writing, puzzle tasks, and competitive sports settings. Content validity for this instrument has been determined in previous studies (Ryan, 1982; McAuley, et al., 1989; Whitehead & Corbin, 1991; Rutherford, Corbin, & Chase, 1992; Dale, Corbin, & Cuddihy, 1998).

Item content on the IMI was not modified for this study. Instead, students were given specific instructions to answer each of the scales in relation to the specific activities in which they participate. Examples of questions in the subscales included in the IMI for this study are included below:

Interest/Enjoyment

I enjoyed this activity very much.

I would describe this activity as very interesting.

Perceived Competence

I think I am pretty good at this activity.

I think I did pretty well at this activity, compared to other students.

Effort/Importance

I put a lot of effort into this.

It was important to me to do well at this task.

Pressure/Tension

I felt very tense about doing this activity.

I was anxious while working on this task.

Value/Usefulness

I believe this activity could be of some value to me.

I believe doing this activity could be beneficial to me.

In addition to the ranked questions, the value/usefulness subscale questions include three open-ended questions. The participant is asked to answer what the activity is useful for, why the activity is important, and how the activity can help them. These questions will be used in this study to identify trends in answers. To determine instrument reliability and internal consistency, a Chronbach's alpha test was performed using data collected in this study. Results of the Chronbach's alpha are shown in Table 2 below.

Table 2

Results of Internal Consistency and Reliability of IMI

IMI Scale	Cronbach's Alpha	N of Items
Interest, Enjoyment	.919	7
Perceived Competence	.889	6
Effort, Energy	.739	5
Pressure, Tension	.873	5
Perceived Choice	.830	7
Value Usefulness	.953	4

Based on the data entered from the participants in this study, all scales of the IMI administered demonstrated an internal consistency and reliability above the recommended 0.80. In fact, five of the six scales ranged were either good or excellent, with only one scale—effort, energy—falling in the acceptable range.

Demographic Form

An author-developed demographic form (Appendix C) was used to gather demographic information about the research participants. Questions related to participant work status, marital status, and previous degree work were included as well as information related to previous experience with simulation activities, hospital clinical experience, number of times enrolled in NURS 3211, and any other information related to medical-surgical experiences.

Procedures

Initial, informal permission to participate in this study was sought from nursing instructors who teach NURS 3211. Initial IRB approval at the site institution was obtained prior to data collection and IRB approval from Georgia Southern Internal Review Board was obtained after the prospectus defense was completed.

Students were informed of the research purpose, procedure, design, and time commitment. Participation was voluntary and students who chose to continue in the research were given instructions on how to develop their own personal identification code on a student identification worksheet (Appendix B) and a demographic survey to fill out. To ensure the uniqueness and stability of student identification codes, students were asked to create a 4 digit code based on letters and numbers corresponding to the third letter of first name, second letter of their birth month, the number of letters in their last name, and the second letter of their last name.

On the first day of the NURS 3211 class during the junior II year, the second semester of the nursing program, participants were given the opportunity to participate in the study. The study's intent and purpose and participant expectations were explained to the participants. Informed consent to participate in the study was implied with the return of the first survey packet containing the consent form (Appendix A), student identification worksheet (Appendix B), demographic form (Appendix C), and the Pre-Simulation *General Self-Efficacy Scale* (GSE) (Appendix D) on the first day of class. Student responses on future surveys were matched using an individualized student identification number, using participant specific information, determined by a student identification worksheet attached to all subsequent surveys.

During the first week of class the participants were randomly assigned to one of two simulation experiences. The names of those students who chose to participate were placed into a hat. Half of the names were drawn and placed into the human patient simulation (HPS) group while the names remaining in the hat were placed into the virtual clinical excursion group (VCE). Participants were not told of their specific group assignment until the day of the experience.

The first simulation experience occurred on the second day of the NURS 3211 class. Participants were asked to fill out the Pre-Simulation *General Self-Efficacy Scale* (GSE) survey along with the demographic form. Immediately after the simulation experience, participants were asked to fill out the Post-Simulation *Intrinsic Motivation Inventory* (IMI) (Appendix E) and Post-Simulation/Pre-Clinical *General Self-Efficacy Scale* (GSE) (Appendix F) relating it to their specific simulation experience. Participants were scheduled to attend a two-day hospital clinical rotation within two weeks of their simulation experience. After the participants completed a two-day hospital clinical rotation experience they were given the Post-Clinical *General Self-Efficacy Scale* (GSE) (Appendix G) relating their responses to their perception of the hospital clinical rotation experience.

Analysis

Based on demographic cultural factors such as generational type or previous degree, the primary objectives of the within-group analysis of the study were to compare and evaluate differences in the group scores on the *General Self-Efficacy Scale* (GSE) at the following three learning periods: prior to a simulation experience, after a simulation experience but before a hospital clinical experience, and after a hospital clinical experience. Also, taking into account demographic cultural factors, group scores on the *Intrinsic Motivation Inventory* (IMI) were explored after a simulation experience. The *Intrinsic Motivation Inventory* is designed to measure student intrinsic motivation after completing a task; therefore, no pretest measure of intrinsic motivation can be taken.

Gain scores for the GSE were calculated for each participant by subtracting pre-simulation scores from post-simulation/pre-clinical scores and post-simulation/pre-clinical scores from post-clinical scores. A Repeated Measures Analysis of Covariance (ANCOVA) was conducted to determine if there is a significant change across the three periods of perceived self-efficacy.

Ethical Considerations

No names were returned with surveys to encourage honest responses. Students were asked to create an individualized code based on specific information and this code was used to match the sequence of surveys distributed for data collection purposes. Participation was voluntary, and confidentiality and anonymity was maintained. Participants were free from risk and harm during the investigation.

Summary

In summary, this quantitative, experimental research design uses both within-group and between-group designs to compare pre-test and post-test scores on the *General Self Efficacy Scale* (GSE) and post-treatment scores on the *Intrinsic Motivation Inventory* (IMI). Permission to adapt the GSE for this study was obtained. An author developed demographic form was used to identify population demographics.

Students were selected from a university in Southern Georgia, were in their Junior II nursing semester, and were currently enrolled in NURS 3211: Health Promotion of Adults. Students were randomly assigned to one of two simulation groups; one group experienced a human patient simulation while the other group experienced a virtual clinical excursion.

The GSE was administered prior to a simulation experience, after a simulation experience, and again after a hospital clinical experience. The IMI was administered after a simulation experience. Students were asked to create an individualized code for their surveys so that their identities were protected.

CHAPTER 4

RESULTS

This chapter will discuss the statistical tests used to analyze the data, results of the data analysis, and the significant findings of the research study for the two research questions. The research study included a total of 126 participants enrolled in a baccalaureate nursing program at a regionally accredited university in South Georgia.

Statistical Tests

The statistical program, SPSS, Version 19 was used to analyze all of the data in this research study. The nature of each statistical test used in the analysis of the data for each research question is discussed within the text in its respective section.

Student Demographics

Each student participant was asked to complete a demographic survey. The demographic survey included demographics such as student sex, age, marital status, number of dependents under the age of 18, employment status, previous degree(s), simulation experience, and hospital experience (see Appendix C for a copy of the demographic survey). Any student who responded to having had another degree was asked to specify in writing the title of their first degree.

Student Sex

The first question asked each student to identify his or her student sex as either female or male. The results of this study indicated a total of 83.3% (n = 105) of the student participants were female and 15.9% (n = 20) were male. One student participant did not include student sex in the survey; therefore, not included in these results.

Table 3
Demographics: Student Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	20	15.9	16.0	16.0
	FEMALE	105	83.3	84.0	100.0
	Total	125	99.2	100.0	
Missing	System	1	.8		
Total		126	100.0		

Student Generational Cohorts

The survey asked participants to write in their exact age. During the data analysis, each participant's age was categorized into a specific generational cohort based on Strauss and Howe's (1991) definition of a length of a generation: Baby Boomer, Generation X, or Generation Y. The results of the participant generations represented in the study are outlined in Table 4.

Table 4
Demographics: Student Generational Cohort

		Frequency	Percent	Valid Percent
Valid	AGE 48-65 (BABY BOOMER)	2	1.6	1.6
	AGE 27-47 (GEN X)	23	18.3	18.9
	AGE 26 AND UNDER (GEN Y)	97	77.0	79.5
	Total	122	96.8	100.0
Missing	System	4	3.2	
Total		126	100.0	

Four students did not indicate their ages on the survey and were therefore not included in the data for this category. Results of this survey found almost all students surveyed were from

Generation X (*n* = 23, 18.3%) or Generation Y (*n* = 97, 77%). Two participants represented the Baby Boomer generation.

Students' First Degree

All participants were asked if they had obtained a previous degree and, if yes, what type of degree it was. A total of 46 participants indicated they had obtained some type of degree prior to entering the BSN program. Two students did not respond to this question and are not included in the data for this category.

Table 5
Demographics: Degree Category

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No degree	78	61.9	62.9	62.9
	Associates or technical	19	15.1	15.3	78.2
	Bachelor's or higher	27	21.4	21.8	100.0
	Total	124	98.4	100.0	
Missing	System	2	1.6		
Total		126	100.0		

Research Questions

The study's primary independent variable was type of clinical simulation to which the subjects were exposed: virtual clinical excursion (VCE) or human patient simulation (HPS). In addition, several other variables were examined as potential moderators of any differences between the effects of the VCE and HPS simulation methods, including student sex, age category (i.e., Baby Boomer, age 48–65; Gen X, age 27–47; and Gen Y, age 26 and under), and educational degree type. Examination of the data revealed only two subjects in the Baby Boomer generation group. Consequently, it was decided to eliminate this category of subjects altogether.

The dependent variables were the six scales of the *Intrinsic Motivation Inventory* and the total score on the *General Self-Efficacy Scale*.

The IMI was administered to subjects after a simulation experience. The GSES was administered to subjects three times: prior to the simulation experience, after the simulation experience but before the hospital clinical experience, and after the hospital clinical experience. The descriptive statistics for the scores on each assessment for the overall sample and for each independent variable subgroup are presented in Table 6.

Table 6

Descriptive Statistics for the Dependent Variables for Overall Sample and by Independent Variable Categories

			Time 1			Time 2			Time 3		
Independent variable	Category	Scale	N	Mean	Std. Deviation	N	Mean	Std. Deviation	N	Mean	Std. Deviation
Overall Sample	All	IMI: Interest/Enjoyment	125.00	4.36	1.45						
		IMI: Perceived Competence	125.00	4.30	1.23						
		IMI: Effort/Importance	125.00	5.88	0.90						
		IMI: Pressure/Tension	125.00	4.05	1.67						
		IMI: Perceived Choice	125.00	3.02	1.38						
		IMI: Value/Usefulness	125.00	5.57	1.51						
		IMI: Overall Mean	125.00	4.53	0.80						
		General Self-Efficacy	125	3.14	0.42	117	3.14	0.51	123	3.49	0.37
Simulation Type	HPS	IMI: Interest/Enjoyment	53	5.40	1.01						
		IMI: Perceived Competence	53	3.94	1.22						
		IMI: Effort/Importance	53	6.00	0.70						
		IMI: Pressure/Tension	53	5.19	1.27						
		IMI: Perceived Choice	53	3.64	1.37						
		IMI: Value/Usefulness	53	6.59	0.72						
		IMI: Overall Mean	53	5.13	0.44						
		General Self-Efficacy	53	3.08	0.42	51	3.04	0.51	52	3.46	0.38
	VCE	IMI: Interest/Enjoyment	72.00	3.59	1.23						
		IMI: Perceived Competence	72.00	4.56	1.17						
		IMI: Effort/Importance	72.00	5.79	1.02						
		IMI: Pressure/Tension	72.00	3.21	1.42						
		IMI: Perceived Choice	72.00	2.56	1.21						
		IMI: Value/Usefulness	72.00	4.82	1.49						

Independent variable	Category	Scale	Time 1 N	Time 1 Mean	Time 1 Std. Deviation	Time 2 N	Time 2 Mean	Time 2 Std. Deviation	Time 3 N	Time 3 Mean	Time 3 Std. Deviation
		IMI: Overall Mean	72.00	4.09	0.71						
		General Self-Efficacy	72	3.18	0.42	65	3.22	0.49	70	3.51	0.36
Generation	Gen X	IMI: Interest/Enjoyment	23	4.18	1.27						
		IMI: Perceived Competence	23	4.09	0.88						
		IMI: Effort/Importance	23	5.55	0.92						
		IMI: Pressure/Tension	23	3.76	1.90						
		IMI: Perceived Choice	23	2.60	1.45						
		IMI: Value/Usefulness	23	5.21	1.43						
		IMI: Overall Mean	23	4.23	0.84						
		General Self-Efficacy	23	2.90	0.44	19	2.85	0.59	22	3.34	0.38
	Gen Y	IMI: Interest/Enjoyment	97	4.35	1.48						
		IMI: Perceived Competence	97	4.29	1.29						
		IMI: Effort/Importance	97	5.95	0.89						
		IMI: Pressure/Tension	97	4.10	1.66						
		IMI: Perceived Choice	97	3.06	1.31						
		IMI: Value/Usefulness	97	5.63	1.53						
		IMI: Overall Mean	97	4.57	0.76						
		General Self-Efficacy	97	3.20	0.39	93	3.19	0.47	95	3.52	0.36
Degree Type	No degree	IMI: Interest/Enjoyment	78	4.37	1.48						
		IMI: Perceived Competence	78	4.29	1.34						
		IMI: Effort/Importance	78	5.95	0.91						
		IMI: Pressure/Tension	78	4.22	1.73						
		IMI: Perceived Choice	78	2.95	1.31						
		IMI: Value/Usefulness	78	5.65	1.49						
		IMI: Overall Mean	78	4.37	1.48						
		General Self-Efficacy	78	3.25	0.34	75	3.19	0.47	76	3.54	0.35

Independent variable	Category	Scale	Time 1 N	Time 1 Mean	Time 1 Std. Deviation	Time 2 N	Time 2 Mean	Time 2 Std. Deviation	Time 3 N	Time 3 Mean	Time 3 Std. Deviation
	Associates or technical school degree	IMI: Interest/Enjoyment	19	4.23	1.56						
		IMI: Perceived Competence	19	4.24	1.20						
		IMI: Effort/Importance	19	5.99	0.84						
		IMI: Pressure/Tension	19	3.63	1.57						
		IMI: Perceived Choice	19	3.02	1.52						
		IMI: Value/Usefulness	19	5.21	1.39						
		IMI: Overall Mean	19	4.23	1.56						
		General Self-Efficacy	19	3.11	0.40	19	3.26	0.45	18	3.57	0.28
	Bachelor's degree or higher	IMI: Interest/Enjoyment	27	4.48	1.33						
		IMI: Perceived Competence	27	4.35	0.93						
		IMI: Effort/Importance	27	5.58	0.89						
		IMI: Pressure/Tension	27	3.89	1.60						
		IMI: Perceived Choice	27	3.26	1.49						
		IMI: Value/Usefulness	27	5.63	1.65						
		IMI: Overall Mean	27	4.48	1.33						
		General Self-Efficacy	27	2.84	0.51	21	2.83	0.58	27	3.29	0.41
Simulation Type HPS by Generation	Gen X	IMI: Interest/Enjoyment	7	5.20	0.98						
		IMI: Perceived Competence	7	3.83	0.64						
		IMI: Effort/Importance	7	6.00	0.59						
		IMI: Pressure/Tension	7	5.46	0.90						
		IMI: Perceived Choice	7	3.22	1.49						
		IMI: Value/Usefulness	7	6.54	0.59						
		IMI: Overall Mean	7	5.20	0.98						
		General Self-Efficacy	7	2.90	0.47	7	2.87	0.58	7	3.19	0.35
	Gen Y	IMI: Interest/Enjoyment	44	5.42	1.04						
		IMI: Perceived	44	3.91	1.29						

Independent variable	Category	Scale	Time 1 N	Time 1 Mean	Time 1 Std. Deviation	Time 2 N	Time 2 Mean	Time 2 Std. Deviation	Time 3 N	Time 3 Mean	Time 3 Std. Deviation
		Competence									
		IMI: Effort/Importance	44	6.00	0.72						
		IMI: Pressure/Tension	44	5.18	1.33						
		IMI: Perceived Choice	44	3.61	1.32						
		IMI: Value/Usefulness	44	6.60	0.75						
		IMI: Overall Mean	44	5.42	1.04						
		General Self-Efficacy	44	3.13	0.40	43	3.07	0.51	43	3.50	0.37
Simulation Type VCE by Generation	Gen X	IMI: Interest/Enjoyment	16	3.73	1.13						
		IMI: Perceived Competence	16	4.20	0.97						
		IMI: Effort/Importance	16	5.35	0.98						
		IMI: Pressure/Tension	16	3.02	1.74						
		IMI: Perceived Choice	16	2.33	1.39						
		IMI: Value/Usefulness	16	4.63	1.30						
		IMI: Overall Mean	16	3.73	1.13						
		General Self-Efficacy	16	2.90	0.44	12	2.83	0.63	15	3.41	0.38
	Gen Y	IMI: Interest/Enjoyment	53	3.47	1.18						
		IMI: Perceived Competence	53	4.61	1.20						
		IMI: Effort/Importance	53	5.92	1.01						
		IMI: Pressure/Tension	53	3.21	1.35						
		IMI: Perceived Choice	53	2.60	1.13						
		IMI: Value/Usefulness	53	4.83	1.55						
		IMI: Overall Mean	53	3.47	1.18						
		General Self-Efficacy	53	3.25	0.38	50	3.29	0.42	52	3.53	0.36
Simulation Type HPS by Degree Type	No degree	IMI: Interest/Enjoyment	33	5.34	1.10						
		IMI: Perceived Competence	33	3.75	1.29						
		IMI: Effort/Importance	33	6.00	0.74						

Independent variable	Category	Scale	Time 1 N	Time 1 Mean	Time 1 Std. Deviation	Time 2 N	Time 2 Mean	Time 2 Std. Deviation	Time 3 N	Time 3 Mean	Time 3 Std. Deviation
		IMI: Pressure/Tension	33	5.56	1.00						
		IMI: Perceived Choice	33	3.29	1.37						
		IMI: Value/Usefulness	33	6.53	0.84						
		IMI: Overall Mean	33	5.34	1.10						
		General Self-Efficacy	33	3.18	0.33	32	2.99	0.53	32	3.48	0.39
	Assoc/tech degree	IMI: Interest/Enjoyment	7	5.86	0.69						
		IMI: Perceived Competence	7	4.29	1.17						
		IMI: Effort/Importance	7	6.17	0.52						
		IMI: Pressure/Tension	7	4.06	1.80						
		IMI: Perceived Choice	7	4.59	0.80						
		IMI: Value/Usefulness	7	6.61	0.50						
		IMI: Overall Mean	7	5.86	0.69						
		General Self-Efficacy	7	3.01	0.56	7	3.38	0.44	7	3.67	0.21
	Bachelor's degree or higher	IMI: Interest/Enjoyment	13	5.32	0.89						
		IMI: Perceived Competence	13	4.23	1.03						
		IMI: Effort/Importance	13	5.92	0.71						
		IMI: Pressure/Tension	13	4.88	1.22						
		IMI: Perceived Choice	13	4.01	1.33						
		IMI: Value/Usefulness	13	6.73	0.47						
		IMI: Overall Mean	13	5.32	0.89						
		General Self-Efficacy	12	2.93	0.47	11	2.97	0.50	12	3.27	0.38
Simulation Type VCE by Degree Type	No degree	IMI: Interest/Enjoyment	45	3.66	1.31						
		IMI: Perceived Competence	45	4.68	1.24						
		IMI: Effort/Importance	45	5.92	1.03						
		IMI: Pressure/Tension	45	3.24	1.48						
		IMI: Perceived Choice	45	2.70	1.21						

Independent variable	Category	Scale	Time 1 N	Time 1 Mean	Time 1 Std. Deviation	Time 2 N	Time 2 Mean	Time 2 Std. Deviation	Time 3 N	Time 3 Mean	Time 3 Std. Deviation
		IMI: Value/Usefulness	45	5.01	1.54						
		IMI: Overall Mean	45	3.66	1.31						
		General Self-Efficacy	45	3.30	0.34	43	3.33	0.37	44	3.58	0.33
	Assoc/tech degree	IMI: Interest/Enjoyment	12	3.27	1.02						
		IMI: Perceived Competence	12	4.21	1.27						
		IMI: Effort/Importance	12	5.88	0.99						
		IMI: Pressure/Tension	12	3.38	1.45						
		IMI: Perceived Choice	12	2.10	0.97						
		IMI: Value/Usefulness	12	4.40	1.03						
		IMI: Overall Mean	12	3.27	1.02						
		General Self-Efficacy	11	3.16	0.30	11	3.17	0.48	10	3.49	0.33
	Bachelor's degree or higher	IMI: Interest/Enjoyment	14	3.71	1.20						
		IMI: Perceived Competence	14	4.46	0.86						
		IMI: Effort/Importance	14	5.26	0.94						
		IMI: Pressure/Tension	14	2.96	1.35						
		IMI: Perceived Choice	14	2.57	1.32						
		IMI: Value/Usefulness	14	4.61	1.70						
		IMI: Overall Mean	14	3.71	1.20						
		General Self-Efficacy	14	2.81	0.55	9	2.65	0.68	14	3.29	0.45

Research Question One

Based on the demographic cultural factors of generational type and previous degree, in what way, if any, do post-simulation intrinsic motivation scores differ between students exposed to virtual clinical excursion (VCE) and human patient simulation (HPS)?

This research question focused on the six scales of the *Intrinsic Motivation Inventory* (IMI), and seeks to determine whether differences exist on the IMI scales between the Generation and Degree Type subgroups. The assessments occurred immediately after the simulation experience, and the intent was to determine whether, within each of the Simulation Type subgroups (i.e., HPS and VCE), the Generation or Degree Type subgroups differed in their mean IMI subscale scores on this assessment. This question was addressed by performing independent group t-tests. Each subgroup on each of the 7 variables was checked for normality. For those that departed from normality, the nonparametric Mann-Whitney test was performed to ensure that the correct conclusion about significance was drawn in each case. Due to familywise error in these analyses, no p-value greater than 0.007 was considered to be significant. Results of the t-tests are listed in Table 7 below. Findings for each group overall IMI score are discussed in detail after the table.

Table 7

Results of Independent t-tests for IMI

		Independent Groups t-test				Mann-Whitney test		
Subgroup	IMI Scale	t	df	Sig. (2-tailed)	Mean Difference (HPS - VCE)	U	Z	Sig. (2-tailed)
Generation X	Interest/enjoyment	2.989	21	.007	1.48	*	*	*
	Perc. competence	-.906	21	.375	-.36	*	*	*
	Effort/importance	1.617	21	.121	.65	*	*	*
	Pressure/tension	3.480	21	.002	2.45	14	-2.824	.005
	Perceived choice	1.389	21	.179	.89	35	-1.414	.157
	Value/usefulness	3.698	21	.001	1.91	11	-3.027	.002
	Overall mean	5.363[a]	21	<.001	1.17	*	*	*
Generation Y	Interest/enjoyment	8.565	95	<.001	1.95	*	*	*
	Perc. competence	-2.752	95	.007	-.70	786.5	-2.753	0.006
	Effort/importance	.457	95	.649	.08	1148	-0.131	0.896
	Pressure/tension	7.195	95	<.001	1.97	*	*	*
	Perceived choice	4.061	95	<.001	1.01	*	*	*
	Value/usefulness	7.351[a]	78.1	<.001	1.78	355.5	-6.036	<.001
	Overall mean	9.074[a]	92.6	<.001	1.01	*	*	*
Degree: No degree	Interest/enjoyment	5.991	76	<.001	1.68	*	*	*
	Perc. competence	-3.189	76	.002	-.92	442	-3.043	0.002
	Effort/importance	.401	76	.690	.08	731.5	-0.112	0.911
	Pressure/tension	8.270[a]	75.5	<.001	2.32	*	*	*
	Perceived choice	1.997	76	.049	.59	*	*	*
	Value/usefulness	5.575[a]	70.8	<.001	1.52	279.5	-4.8	<.001

	Overall mean	6.030	76	<.001	.88	*	*	*
Degree: Associate or technical school	Interest/enjoyment	5.913	17	<.001	2.58	*	*	*
	Perc. competence	.132	17	.897	.08	*	*	*
	Effort/importance	.832[a]	16.9	.417	.29	*	*	*
	Pressure/tension	.896	17	.383	.67	*	*	*
	Perceived choice	5.753	17	<.001	2.50	*	*	*
	Value/usefulness	5.309	17	<.001	2.21	3	-3.33	.001
	Overall mean	6.222	17	<.001	1.39	*	*	*
Degree: Bachelor's or higher	Interest/enjoyment	3.935	25	.001	1.61	26	-3.158	.002
	Perc. competence	-.642	25	.527	-.23	*	*	*
	Effort/importance	2.056	25	.050	.67	*	*	*
	Pressure/tension	3.862	25	.001	1.92	*	*	*
	Perceived choice	2.813	25	.009	1.44	37	-2.628	.009
	Value/usefulness	4.490[a]	15.1	<.001	2.12	25.5	-3.296	.001
	Overall mean	5.379	25	<.001	1.25	*	*	*

* Distributions did not depart from normality; no nonparametric test necessary

[a] Levene's test for variance homogeneity significant; degrees of freedom correction applied

<u>Interest/Enjoyment</u>

The first significant finding was that all groups (generation X, generation Y, no degree, associate or technical degree, and bachelor’s or higher degree students) who experienced the HPS simulation setting had significantly higher scores on the interest/enjoyment IMI subscale than those who experienced the VCE simulation setting (significance ranges from p = 0.001–0.007). Scores are listed below in Table 8.

Table 8

HPS vs VCE Scores on Interest/Enjoyment IMI Subscale

Subgroup	HPS	VCE	Sig (2-tailed)
Generation X	5.20	3.73	0.007
Generation Y	5.42	3.47	<0.001
No degree	5.34	3.66	<0.001
Associate or technical school	5.86	3.27	<0.001
Bachelor's or higher	5.32	3.71	0.001

Perceive Competence

On the perceived competence subscale of the IMI, generation Y and those students who had no previous degree showed significant differences in scores when given the HPS simulation versus the VCE simulation (significance ranges p = 0.002–0.007). Those students who were given the VCE experience scored lower on the perceived competence subscale than those students exposed to the HPS simulation. This indicates that those students who were exposed to the computer based simulation rather than the hands-on simulation felt more competent while performing the task. Scores are listed below in Table 9.

Table 9

HPS vs VCE Scores on Perceived Competence IMI Subscale

Subgroup	HPS	VCE	Sig (2-tailed)
Generation X	3.83	4.20	0.375
Generation Y	3.91	4.61	0.007
No degree	3.75	4.68	0.002
Associate or technical school	4.29	4.21	0.897
Bachelor's or higher	4.23	4.46	0.527

Effort/ Importance

No significance was found in the scores on the effort/importance subscale of the IMI. This indicates that the level of perceived effort given to the activity and importance of performing well on the activity for each simulation activity was fairly equal among all of the groups of students. Scores are listed below in table 10.

Table 10

HPS vs VCE Scores on Effort/Importance IMI Subscale

Subgroup	**HPS**	**VCE**	**Sig (2-tailed)**
Generation X	6.00	6.00	0.121
Generation Y	6.00	5.92	0.649
No degree	6.00	5.92	0.690
Associate or technical school	6.17	5.88	0.417
Bachelor's or higher	5.92	5.26	0.50

Pressure/Tension

Significant differences in scores were found on all of the group scores on the pressure/tension subsection of the IMI, with the exception of the associate or technical degree group. For those groups with significant differences, p values ranged from $p < 0.001$ – $p = 0.002$. Groups that experienced the HPS simulation, except those in the associate or technical school degree group, indicated that they felt less pressure and tension than those who participated in the VCE simulation experience. For consistency with the IMI, some questions in this section are reversed during data entry. Therefore, a higher result indicates that a student felt more relaxed and less anxious or pressured during an exercise. Results are listed below in Table 11.

Table 11

HPS vs VCE Scores on Pressure/Tension IMI Subscale

Subgroup	**HPS**	**VCE**	**Sig (2-tailed)**
Generation X	5.46	3.02	0.002
Generation Y	5.18	3.21	<0.001
No degree	5.56	3.24	<0.001
Associate or technical school	4.06	3.38	0.383
Bachelor's or higher	4.88	2.96	0.001

Perceived Choice

On the perceived choice subsection of the IMI, generation Y, associate or technical degree students, and bachelor's degree or higher students in the HPS experience indicated that they felt that they had more of a choice in relation to completing the exercise than did those students in the VCE experience. While HPS group scores were low, overall scores were relatively low as well, with a total group average (both simulation experiences) score of 3.02 (on a 1–7 scale, right between *not true at all* and *somewhat* true), indicating that participants in both groups felt like they were given very little choice regarding the completion of the activity. For consistency with the IMI, some questions in this section are reversed during data entry. Therefore, a higher result indicates that a student felt that they had more of a choice related to completion of the activity. Results are listed below in table 12.

Table 12

HPS vs VCE Scores on Perceived Choice IMI Subscale

Subgroup	**HPS**	**VCE**	**Sig (2-tailed)**
Generation X	3.22	2.33	0.179
Generation Y	3.61	2.60	<0.001
No degree	3.29	2.70	0.049
Associate or technical school	4.59	2.10	<0.001
Bachelor's or higher	4.01	2.57	0.009

Value/Usefulness

An important finding in this study is that all groups (generation X, generation Y, no degree, associate or technical degree, and bachelor's or higher degree students) who experienced the HPS simulation setting had significantly higher scores on the value/usefulness IMI subscale than those who experienced the VCE simulation setting. Significance for all levels was $p \leq 0.001$. All students who participated in the HPS simulation experience found the experience to be more valuable and useful, with average scores ranging from 6.53–6.73, than those students who participated in the VCE simulation experience, with scores ranging from 4.61–5.01 on a 1–7 scale. Scores are listed in table 13 below.

Table 13

HPS vs VCE Scores on Value/Usefulness IMI Subscale

Subgroup	**HPS**	**VCE**	**Sig (2-tailed)**
Generation X	6.54	4.63	0.001
Generation Y	6.60	4.83	<0.001
No degree	6.53	5.01	<0.001
Associate or technical school	6.61	4.40	<0.001
Bachelor's or higher	6.73	4.61	<0.001

Overall Mean Score

When looking at the overall mean score on all of the subsections of the IMI, all groups of students who participated in the HPS simulation experience had average group scores higher than those students who participated in the VCE simulation experience. Overall group scores are listed in table 14 below. Note that all significance values were $p < 0.001$.

Table 14

Total Group Scores on IMI: HPS vs VCE

Subgroup	HPS	VCE	Sig (2-tailed)
Generation X	5.20	3.73	<0.001
Generation Y	5.42	3.47	<0.001
No degree	5.34	3.66	<0.001
Associate or technical school	5.86	3.27	<0.001
Bachelor's or higher	5.32	3.71	<0.001

Research Question Two

Based on demographic cultural factors such as generational type or previous degree, to what extent, if any, do nursing pre-simulation, post-simulation, and post-clinical self-efficacy scores differ between students exposed to virtual clinical excursion (VCE) and those exposed to human patient simulation (HPS)?

The second research question focused on the *General Self-Efficacy Scale* (GSE). This scale produces one total score. This question was addressed by computing the pre-post change score between each GSE assessment, and using these change scores as the dependent variables in analyses of covariance (ANCOVA) which controlled for differences on the earlier assessment in each change score by specifying this assessment as the covariate. Three separate change scores were computed: assessment one to assessment two, assessment one to assessment three, and assessment two to assessment three. Three ANCOVAs were performed to address this research question, one for each of the three GSES change scores serving as the dependent variable.

The data were examined for conformity to the assumptions of ANOCVA. There were no significant departures from variance equality as assessed by the Levene test (viz., for change on the perceived competence score). The distributions of scores departed significantly from normality for six of the 12 combinations of independent variable subgroups and three dependent variables as tested by the Shapiro Wilk test. However, in only one case did the value of the statistic fail to equal or exceed the 0.90 rule of thumb critical value. Degree type (no degree) on GSE time 1 to time 2 Change, and even this was very close to 0.90 (i.e., 0.894). If significant change levels are found in the analyses involving this subgroup-by-change score combination, the results will have to be interpreted with an enhanced degree of conservatism. The results of these ANCOVAs are reported in Table 15.

Table 15

Results of Analysis of Covariance of Changes in GSE Scores by Simulation Type with Demographic Moderators

Dependent Variable	**Source**	***Df***	***F***	***p***	**Partial η^2**
Change in GSES: Time 1 to Time 2	Simulation type	1	.007	.932	.000
	Generation	1	1.737	.191	.017
	Degree type	2	1.129	.328	.022
	Simulation type/ Generation	1	.221	.640	.002
	Simulation type/ Degree type	2	4.404	.015*	.082
	Generation/ Degree type	2	1.475	.234	.029
	Simulation type/ Generation/ Degree type	1	1.560	.215	.016
	Pre-test (covariate)	1	9.212	.003**	.085
	Error	99	(.140)		
Change in GSES: Time 1 to Time 3	Simulation type	1	.787	.377	.008
	Generation	1	.535	.466	.005

Dependent Variable	Source	*Df*	*F*	*p*	Partial η^2
	Degree type	2	.267	.767	.005
	Simulation type/ Generation	1	3.591	.061	.033
	Simulation type/ Degree type	2	.792	.456	.015
	Generation/ Degree type	2	1.766	.176	.033
	Simulation type/ Generation/ Degree type	1	.081	.777	.001
	Pre-test (covariate)	1	48.091	<.001**	.316
	Error	104	(.096)		
Change in GSES: Time 2 to Time 3	Simulation type	1	.971	.327	.010
	Generation	1	.032	.858	.000
	Degree type	2	.310	.734	.006
	Simulation type/ Generation	1	5.135	.026	.050
	Simulation type/ Degree type	2	.055	.947	.001
	Generation/ Degree type	2	1.754	.179	.035
	Simulation type/ Generation / Degree type	1	.097	.756	.001
	Pre-test (covariate)	1	76.259	<.001	.440
	Error	97	(.080)		

Note. Value enclosed in parentheses represents mean square error.
* $p < .05$
** $p < .01$

The results of the ANCOVAs reported in Table 9 reveal that none of the main effects (i.e., simulation type, generation, and degree type) were significant for any of the GSE change scores. Among the interaction effects tested, only one proved to be significant: simulation type/ degree type for the GSE time 1 to time 2 change. An examination of the means revealed that among subjects with the midlevel degree type (i.e., associate or technical degree), those experiencing the HPS simulation exhibited a substantially higher mean gain in GSE between the first two assessments than did those experiencing the VCE simulation. In the no degree group those in the VCE condition exhibited more gain in GSES than those in the HPS group, and this result was reversed among the bachelor's degree or higher group. However, the differences in the latter two groups were much less pronounced than in the midlevel degree type group. This significant interaction is best interpreted as the presence of an appreciable disparity in GSE gain for the midlevel group versus the absence of any such disparity for the other two degree type groups.

Summary

In summary, the common theme found when analyzing the IMI scores was that groups who experienced the HPS simulation experience scored higher on the overall IMI group average score and on nearly all of the IMI subscales. Significantly higher scores were noted in interest/enjoyment and value/usefulness subscales for generation X students in the HPS group. Generation Y students in the HPS group scored significantly higher than the VCE group on the interest/enjoyment, perceived choice, and value/usefulness subscales. Students with no previous degree in the HPS group had mean scores higher than those in the VCE group on interest/enjoyment, perceived competence, and value/usefulness subscales. Students with associate or technical degrees in the HPS group had higher mean scores than VCE students on the interest/enjoyment, perceived choice, and value/usefulness subscales. Finally, students with bachelor's degrees or higher in the HPS group had higher scores than the VCE group on the interest/enjoyment and value/usefulness subscales. All groups exposed to the HPS exercise, with the exception of students with associate or technical degrees, also indicated feeling more pressure and tension than those students who participated in the VCE simulation exercise.

The results of the ANCOVA revealed that none of the main effects, (simulation type, generation, and degree type) were significant for any of the general self-efficacy change scores. There was only one interaction tested that proved to be significant: simulation type/degree type for the GSE from time 1 to time 2. Students in the HPS simulation experience with a midlevel degree type (associate or technical degree) exhibited a substantially higher mean gain in GSE between the first two assessments than did those in the VCE simulation experience. Additional changes should be noted in other groups as well, but they were much less pronounced. In the no degree group of students, those in the VCE simulation experience exhibited more gain in GSE than those in the HPS simulation experience. On the contrary, students with a bachelor's degree or higher exhibited more gain in GSE when exposed to the HPS simulation experience than those exposed to the VCE simulation experience.

CHAPTER 5

DISCUSSION AND SUMMARY

Nursing education is experiencing a generational phenomenon with student enrollment spanning three generations and many students returning to school already possessing a previous bachelor's degree. Baby boomer, Generation X, and Generation Y students are creating a very different culture in the classroom. Many of these students are non-traditional in that they have already obtained a bachelor's degree and are returning to school for various reasons such as desire for career change and a declining economy where other jobs may be difficult to find.

This chapter will review the research study, purpose of the study and the research design as well as discussion of the results. Specifically, this chapter will discuss the following: interpretation of results for the two research questions; connections with the literature review and theoretical context; limitations of the study; implications for nursing education; and suggestions for future research.

Purpose of Study and Research Design

As enrollment in nursing programs increases many nursing schools are encountering difficulty finding adequate clinical placement for students. One popular solution to this dilemma has been the implementation of simulation in the nursing curriculum. Much research has been done on simulation overall. However, there is lack of research on simulation and its effect on the self-efficacy and intrinsic motivation of students from various cultural backgrounds, such as different generations or previous bachelor's degrees.

The purpose of this study was to examine the effects of two forms of simulation, Virtual Clinical Excursion (VCE) and Human Patient Simulation (HPS), on the self-efficacy and intrinsic motivation of students from different generations and with previous bachelor's degrees.

Because simulation is becoming a widely popular educational strategy in nursing programs, it is essential to understand the effects to determine if these types of experiences effectively and appropriately meet the cultural needs of diverse student nurses.

This quantitative study used two surveys, the *General Self-Efficacy Survey* (GSE) and the *Intrinsic Motivation Inventory* (IMI), and one demographic survey. The GSE was modified and adapted to examine student self-efficacy of nursing clinical objectives. Student self-efficacy was measured prior to a simulation experience, after a simulation experience, and after a two-day hospital clinical rotation. Intrinsic motivation was measured after a simulation experience.

The research study included 126 second-semester nursing students. The generational diversity among students in the study consisted of two Baby Boomer students; 23 Generation X students, and 97 Generation Y students. Seventy-eight students had no previous degree, 16 students had a previous associate degree, 26 students had a previous bachelor's degree, one student had an associate and a technical degree, one student had a bachelor's and master's degree, and one student had higher than a master's degree. The large number of Generation Y students in this study corresponded with the large number of journal articles and research studies found discussing this generation. A shift has occurred in the literature from the study of Generation X to the study of Generation Y. Because the Baby Boomer generation was significantly underrepresented in the sample, the data from this generational cohort were not used in the analysis of the research questions.

Research Question One

Based on demographic cultural factors such as generational type and previous degree, to what extent, if any, do post-simulation intrinsic motivation scores differ between students exposed to virtual clinical excursion (VCE) and human patient simulation (HPS)?

The results of the data analysis found many significant findings in the scores on the various subscales of the IMI. Since the subscales used in this study—interest/enjoyment, perceived competence, effort/importance, pressure/tension, and value/usefulness—are noted as the self-report measure of intrinsic motivation, these results are especially important to educators. The first assumption of Knowles's andragogical theory of adult learning is that adults need to understand the relevance of learning, and they learn best when information can be applied to real-life experiences (Knowles, 1990). The value/usefulness subscale of the IMI measures the learner's perception of the value and usefulness of an activity. In this study, all groups who experienced the HPS simulation (generation X, generation Y, students with no previous degree, students with a previous associate or technical degree, and students with a previous bachelor's degree or higher) had significantly higher scores on the value/usefulness subscale of the IMI. In addition, all group mean scores for students experiencing the HPS simulation were above 6.50 on a Lickert scale from 1–7, indicating that these groups of students found this simulation activity to be particularly valuable and useful. To understand the significance, one may look at the mean group scores of those students exposed to the VCE simulation experience. The highest group mean score on the value/usefulness subscale was associated with students with no previous degree. Their mean group score was only 5.01, significantly lower than the scores presented by the HPS groups.

When a learner finds an activity to be valuable and useful, it is likely that the learner will spend more effort on and place emphasis on the importance of doing well in that activity. Social cognitive theory is based on the notion that individuals proactively engage in their own development and are able to determine personal outcomes by the actions they take (Pajares, 2002). When a learner perceives the importance of putting effort into doing a task well, they are actively engaging in their own learning. No significant differences were found in the group scores on the effort/important subscale of the IMI, however, it should be noted that all groups (both HPS and VCE) scored above a 5.26 on a 1 to 7 scale on this subscale. In fact, the total group mean score was 5.88, indicating that the entire group found it important to place effort into performing this task well.

The second assumption of Knowles's andragogical theory of adult learning implies that adults need to be responsible for their own learning and decisions (Knowles, 1990). The perceived choice subscale of the IMI measures the learner's perception of their choice to complete the task at hand; in this study it was the simulation experience (HPS or VCE). All HPS groups, with the exception of generation X, indicated that they felt less of a choice in relation to completing their simulation exercise than did those students in the VCE experience. However, it should be noted that the overall group mean score on this subscale was 3.02 on a 1–7 scale. This score falls right between *1, not true at all* and *7, somewhat true*), indicating that participants in both groups felt like they were given very little choice regarding the completion of the activity. For consistency with the IMI, some questions in this section were reversed during data entry. Therefore, a higher result indicated that a student felt that they had more of a choice related to completion of the activity. One possible explanation for this finding is the condition under which the study was conducted. Data was collected during a nursing course. Though students were given the option to participate, it could be possible that students felt obligated to complete the exercises since they knew the information was relevant to the nursing course.

Readiness to learn and motivation are the fourth and sixth assumptions in Knowles's theory (Knowles, 1990). Adults will have a stronger desire to learn and will choose to learn when they have a need or interest to learn. They are often motivated by internal pressures and in this time of economic crisis and high unemployment rates, adult learners realize that the time to learn is now. All groups who experienced the HPS simulation had significantly higher scores on the interest/enjoyment IMI subscale. This indicates a higher level of interest and enjoyment in the HPS activity over the VCE activity.

In addition, all HPS groups (with the exception of the associate or technical degree student) showed significantly higher scores on the pressure/tension subscale of the IMI. Due to reverse scoring, higher scores on the pressure/tension subscale indicated less pressure and tension. Since pressure and tension are considered to be negative predictors of intrinsic motivation, it is desirable to have lower scores for this subscale.

The perceived competence subscale of the IMI assessed the group's perception of how well they achieved the task given to them (HPS or VCE experience). For Bandura (1986), self-reflection is a characteristic that is unique to humans and allows for reflection of themselves, their capabilities, and on experiences allowing for the development of new knowledge. When a learner is able to positively reflect on an experience and their actions during that experience, the learner is likely to remember and learn more from the experience. In addition, a positive experience will increase self-efficacy. The results of this study indicated that students in the VCE exercise tended to feel more competent while performing simulation than those in the HPS group. Significant increases in perceived competence scores were seen in both generation Y and students with no previous degree. One possible explanation for this significant finding is that most of the students with no previous degree are from the generation Y age group. This group of students, known as digital natives, has spent their entire lives around computers and videogames (Rothgeb, 2008). They are accustomed to the rapid sensory stimulation and may feel more comfortable with computer-based simulation.

When looking at the overall mean scores of the groups on the IMI, all groups of students who participated in the HPS simulation experience had average group scores higher than those students who participated in the VCE simulation experience. Significance was found at all levels and in all groups ($p < 0.001$). This is an important finding because, along with most of the other individual IMI subscales, the HPS simulation activity may be identified as a more appropriate and motivating learning environment for all students. In a time where cost versus educational benefits is a point of discussion, noting that groups in the HPS simulation experience scored significantly higher on the IMI mean score than the groups in the VCE helps to justify the cost of the equipment. In addition, this finding begins the dialogue of the appropriateness of simulation for the various students from different cultural demographic areas because it confirms that HPS is appropriate for all groups, despite cultural demographics (group mean score 5.13 in HPS group versus 4.09 in VCE group).

Research Question Two

Based on demographic cultural factors of generational type and previous degree, to what extent, if any, do nursing pre-simulation, post-simulation, and post-clinical self-efficacy scores differ between students exposed to virtual clinical excursion (VCE) and human patient simulation (HPS)?

The results of the ANCOVAs revealed that none of the main effects (i.e., simulation type, generation, and degree type) were significant for any of the GSE change scores. Among the interaction effects tested, only one proved to be significant. Findings are discussed below.

Human Patient Simulation vs Virtual Clinical Excursion

An examination of the means of GSE scores revealed that among subjects with the midlevel degree type (i.e., associate or technical degree), those who were given the HPS simulation experience exhibited a substantially higher mean gain in GSE between the first two assessments than did those experiencing the VCE simulation experience. What is interesting to note is that students with no previous degree exhibited more gain in GSE scores when given the VCE experience rather than the HPS experience while students in the bachelor's degree or higher group exhibited more gain in GSE scores when given the HPS experience instead of the VCE experience. Each of these findings is discussed in further detail below.

Students with the midlevel degree type (i.e., associate or technical degree) who were given the HPS simulation experience exhibited a substantially higher mean gain in self-efficacy between the first two assessments than did those experiencing the VCE simulation. In addition, students in the bachelor's degree or higher group exhibited more gain in GSE scores when given the HPS experience instead of the VCE experience, although the scores were not as substantially high as in the associate or technical degree group. In general, second-degree students tend to be older (range 28-40 years) than traditional BSN students (Toth, Dobratz, & Boni, 1998; Wu & Connelly, 1992). With this age range, one can assume that the majority of the students in this study were classified as generation X students and adult learners.

Bandura (1986) defined self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances (p. 391). The same person may perform very differently on the same task on different occasions based on their self-efficacy at the time the task was completed. In fact, Bandura (1997) contends "people's level of motivation, affective states, and actions are based more on what they believe than on what is objectively true" (p. 2). Generation X students expect the use of technology in the classroom along with instant response and satisfaction (Johnson & Romanello, 2005). They have little regard for wasted time or non-relevant information (Coates, 2007; Johnson &

Romanello, 2005). These students bring with them various previous life experiences that they draw upon when in the simulation setting.

Human patient simulation allows the learners to utilize hands-on technology in the classroom environment while providing instant feedback. It is fast-paced with each moment being utilized as a teaching/learning moment. Students work in groups and are able to learn by using their own life experiences and by watching the experiences of others. By symbolically coding information learned from observation of others, individuals can often learn and avoid mistakes without actually having to perform an action (Pajares, 2002). Since reported self-efficacy was based on the clinical objectives for NURS 3212, it is not unexpected that second degree students exhibited higher self efficacy scores after participating in human patient simulation, especially when one considers the extent of previous social and academic life skills that this group possessed and was able to utilize in the interactive group simulation learning experience.

On the other hand, students with no previous degree exhibited more gain in GSE scores when given the VCE experience rather than the HPS experience. Again, the traditional (no degree) student is typically younger and falls in the generation Y category. According to the NLN (2010), this group of students is representative of the typical traditional BSN student of today. Tapscott (1998) describes this student as self-reliant and with characteristic themes of fierce independence. They grew up with digital technology such as computers and videogames (Rothgeb, 2008). Virtual clinical excursion is very similar to a clinical videogame in that the student essentially plays out a clinical scenario by inputting data into a computer using a keyboard and mouse. These students tend to have limited life experiences that they are able to draw upon when working in group activities. They have a preference for learning on their own time and also on their own terms (McGlynn, 2005). Virtual clinical excursion, while timed, allows students to pause the scenario at their leisure and to use alternative resources to gather information related to clinical decisions made in the simulation.

While differences in the latter two groups are much less pronounced than in the midlevel degree type group, all disparities should be carefully considered when determining which simulation type is most effective for the various nursing student cultures. Because each generation of learners has different learning needs, educators need to: expect that younger adults will learn differently than children or older adults, expect that learning styles will change over time, and expect that learning environments may influence how individuals prefer to learn.

Delimitations of the Study

A delimitation of this study is that the data analysis was confined to baccalaureate nursing students enrolled in a junior level medical-surgical course from one regional university. This study only investigated one scenario from two forms of simulation: Human Patient Simulation (HPS) and Virtual Clinical Excursion (VCE).

Limitations of the Study

For research question two, the data from the GSE scores were examined for conformity to the assumptions of ANCOVA. There were no significant departures from variance equality as assessed by the Levene test. However, the distribution of scores departed significantly from normality for 6 of the 12 combinations of independent variable subgroups and three dependent variables as tested by the Shapiro Wilk test. Only in one case did the value of the statistic fail to equal or exceed the 0.90 rule of thumb critical value. While there was a significant change level found in the analysis involving this subgroup-by-change score combination (no degree on GSE time 1 to time 2 change), the value was very close to the 0.90 rule of thumb critical value

(0.894). Therefore, the results while still being interpreted with some conservatism, may be considered significant.

Only two participants within the population were identified as being in the baby boomer generation. As a result, it was decided to eliminate this category of subjects all together. Therefore, results for the research questions do not address this generation of students.

A power analysis was done to determine the number of subjects needed for the types of analyses done in this study. While the number of subjects was adequate, $N = 126$, it was low for the ANOVA and ANCOVA analyses done and may be considered a limitation to this study.

One final limitation for this study is the lack of a control group. Both groups were exposed to one form of simulation, either virtual clinical excursion or human patient simulation prior to their hospital clinical rotation. To determine if simulation has any effect on self-efficacy in the hospital clinical rotation, future studies should include a control group that is not exposed to any type of simulation prior to a hospital clinical rotation.

Implications for Nursing Education

This research study has numerous implications for nursing education and nursing simulation literature. It adds new knowledge concerning intrinsic motivation and self-efficacy as they relate to various types of simulation activities and hospital clinical rotations. It provides educators with new information about what is motivationally appropriate and effective for nursing students with cultural demographical differences such as generational type and previous degree. Nurse educators may use the information in this study to provide an effective learning environment for all types of students.

With higher education facing new social and economic demands, including budget cuts and increased student diversity, many schools are revising teaching strategies within their curricula to provide adequate and effective learning opportunities. Many schools are now turning to simulation activities as clinical supplemental activities to meet the increasing demand and higher expectations of employers. The most common forms of simulation used today include Human Patient Simulation (HPS) and Virtual Clinical Excursion (VCE). Currently, there is literature related to self-efficacy and simulation. However, no literature was found comparing motivational effects of the various forms of simulation on culturally diverse students.

Since students may perform very differently on the same task on different occasions based on their perceived self-efficacy at the time the task was completed, it is essential to provide students with activities that increase their perceived competence levels. The perceived competence subscale of the IMI was one area where students in the VCE groups scored higher than the HPS groups. Knowing that students felt more competent when not working face to face with an instructor and in groups may influence how instruction is delivered. Faculty may choose to begin students with some form of computer-based simulation to allow students to develop a sense of competence before introducing them to hand-on, interactive, group simulation activities. In addition, during any type of hands-on, high-fidelity human patient simulation, faculty should carefully evaluate interactions and feedback provided to the student.

Seeing a learning activity as valuable and useful increases learner motivation. When simulation experiences are used, students need to be informed of the intent, value, and learning outcomes expected of the specific simulation experience. Results of the IMI indicate that students see simulation as valuable. Although the degree of value and usefulness varied among the research groups, there were significantly higher scores in all of the HPS groups, indicating that HPS simulation was seen as a valuable part of the nursing curriculum. According to the findings of the present study and its supporting theoretical frameworks, nurse educators need to continue to use human patient simulation with students of all cultural demographic backgrounds in the nursing curriculum.

The results of the IMI were fairly consistent. Most groups experiencing the HPS simulation scored higher than the VCE groups on the *Intrinsic Motivation Inventory* (IMI) subscales. However, it should be noted that while students with HPS simulation experiences scored higher on the average than students with VCE experiences, not all students with VCE experiences scored low on the IMI subscales. This study sought to explore differences in IMI scores after exposure to HPS and VCE among students with various cultural demographics (generational type and previous degree). Differences were seen, and often HPS groups had higher mean scores on the average than VCE groups, but educators must use caution when using this information to rule out one type of simulation over another, especially for individual students. Educators should be encouraged, based on these results, to use the various forms of simulation when appropriate with all students, regardless of demographic cultural factors.

Research question two computed the pre-post change score between three GSE assessments: pre-simulation, post-simulation, and post-hospital clinical rotation. The intent was to note any significant gain score changes among the various cultural demographic factors (generation and degree type) prior to a simulation experience, after a simulation experience, and after a hospital clinical rotation and to determine which type of simulation, if any, appeared effective in improving student self-efficacy related to course clinical objectives.

The only result of any significance was the increase in GSE scores from time 1 (pre-simulation) to time 2 (post-simulation) among the midlevel degree type students (associate or technical degree). Those experiencing the HPS simulation exhibited a substantially higher mean gain in GSE than those in the VCE simulation experience. While not statistically significant, it should be noted that students in the bachelor's degree or higher group also showed a gain in GSE scores from time 1 to time 2 when exposed to the HPS simulation versus the VCE simulation. As previously discussed, this may be due to second degree students' ability to use previous social and academic experiences to maximize the potential of the simulation learning environment.

On the other hand, students with no degree exhibited more gain in GSE scores when exposed to VCE than those in the HPS group. This may be due to the younger nature of the students. This younger generation, often generation Y, are familiar with the videogame type format that the VCE simulation experience offers.

As educators, these findings may influence how we design our nursing curricula. Realizing that students with no previous degree would traditionally be enrolled in the generic track baccalaureate programs while those with a previous degree often are enrolled in the accelerated baccalaureate programs, educators may design the two curricula to fit the needs of the population being served.

For example, traditional nursing students may benefit more from the VCE simulation experience during their first year of nursing school due to their lack of previous experiences and their ability and desire to use computer-based applications. Being able to work at a pace that allows these students time to pause a scenario to look up pertinent information prior to making clinical decisions may be an optimal way to teach these students. These students will gain life and academic experiences through the VCE and classroom learning labs and may be better able to successfully participate in an HPS experience in their second year of nursing school.

For second-degree students, often the generation X students, human patient simulation may be a better choice throughout the entire nursing curriculum. Since these students draw on previous life experience as well as learn from watching others' experiences, HPS along with hospital clinical rotations may be the optimal choice of experiences to be incorporated throughout the accelerated baccalaureate curriculum.

Educators should use these results along with other research results to determine what learning experiences are best for the students they currently teach. While this research adds knowledge to the current literature on intrinsic motivation, self-efficacy, and simulation, it should not be used alone to determine teaching strategies. Educators need to understand educational implications related to student generational cohorts but should avoid over-generalizing and stereotyping generational preferences or learning styles based solely on age, especially for individual students. The findings of the present study are based on averages, which may not consistently apply to each individual student within a generational cohort.

Suggestions for Future Research

As simulation becomes a dominant force in the education of baccalaureate nursing students, it is essential for educators to consider how the various types of simulation affect the newly emerging culture of nursing students. This study chose to look at the cultural demographic factors of generational type and degree type (no degree, associates or technical degree, bachelor's degree or higher). A replication of this study is recommended to increase the knowledge learned from this study. One way to improve this study would be to increase the number of participants so that results could be more generalized to baccalaureate nursing student education. Replication of this study will allow educators to gain a better understanding of how students view the various forms of simulation. How a student views a learning activity determines the student's motivation to complete the activity and ultimately may determine what, if anything, the student gains from the activity. Because the nursing curriculum is typically only four semesters long, each learning activity needs to be used to its maximum potential.

Participants in this study were divided into one of three generations based on age. These generations, while clearly defined, limited the students into two groups (since only two participants were categorized in the Baby Boomer generation). Replication of this study may be strengthened by dividing students into "5–10" year age brackets rather than generations that span a 20-year time frame. Knowing in more detail, which ages respond to and are more affected by simulation, may allow educators to evaluate their teaching styles based on demographics within the classroom.

Since all groups demonstrated increased self-efficacy from the time 1 to the time 3 administration, simulation may have been a contributing factor to the increase in self-efficacy. It is highly recommended that this study be replicated using a control group, not exposed to a simulation experience, to determine if simulation is a contributing factor to the increase in student self-efficacy.

Conclusion

Nursing education is experiencing a cultural phenomenon with student enrollment spanning three generations and including previous degree types. With budget cuts, increased demands, and limited clinical placement sites, many nursing programs have turned to simulation as a prevalent clinical education tool. A wide array of literature exists regarding simulation and self-efficacy. However, very limited research exists that takes into consideration student cultural demographic data such as generation or previous degree. Educators must provide an equitable learning environment for all students, and this cannot be done without understanding how an educational tool, such as simulation, affects students in various generational cohorts and those who may already have a previous degree.

Since this study opens a new arena of research regarding simulation and cultural demographic data, educators can use this knowledge to support the application of simulation with students from all generations and degree types. Mean scores from all students showed that students found both types of simulation valuable and useful. In addition, all groups of students demonstrated some degree of increased self-efficacy from the time 1 administration (pre-simulation) to the time 3 administration (post-hospital clinical rotation).

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APPENDIX A

Participant Information Letter and Consent Form

INFORMED CONSENT

A Comparison of the Effects of Nursing Simulation on Undergraduate BSN Self-Efficacy

Investigator: Michelle Gilbert, RN, MSN
EdD Student, Georgia Southern University

You are being asked to participate in a project conducted by Michelle Gilbert, RN, MSN at Valdosta State University. The Georgia Southern University and Valdosta State University ask that you give your consent to participate in this project. By filling out and returning the attached survey, it is understood that your consent has been given to participate in this study.

This study consists of a series of questionnaires that will be given to junior II nursing students in a BSN program. The questionnaires consist of surveys that address student self-efficacy and intrinsic motivation prior to and after a nursing simulation and after a hospital clinical rotation. The surveys are The General Perceived Self-Efficacy Scale by Ralf Schwarzer and The Intrinsic Motivation Inventory by Edward Deci. It is the intent that this study will be used to assess and compare effects of simulation on nursing student self-efficacy and intrinsic motivation. In addition, data will be used for curriculum improvement, course improvement, and evaluation of teaching/ learning methods.

You will be asked to fill out the questionnaires prior to and after a simulation experience and after a hospital clinical rotation. To ensure confidentiality, you will be asked to provide a 4-digit identification code based on a student identification code worksheet. It is essential that you use the same code for each subsequent questionnaire so that data may be compared.

Questions about the research and requests for results of the research should be directed to Michelle Gilbert, RN, MSN at 229-333-7306 or megilber@valdosta.edu. This study has been exempted from Institutional Review Board (IRB) review in accordance with federal regulations. If you have concerns or questions about your rights as a research participant, you may contact the IRB Administrator, (*insert IRB info.*) (The IRB is a university committee charged with reviewing research protocols to ensure the safety and welfare of research participants.)

Thank you for your time,

Michelle Gilbert, RN, MSN
Second Degree Program Manager/Instructor
Valdosta State University
College of Nursing

I understand that my completion of this survey and any subsequent surveys (or questionnaires) implies my consent to participate in this study

APPENDIX B

Student Identification Worksheet

How to Determine Your
Student Identification Code

Each time you fill out a survey you will be asked to provide your unique student ID code so that your answers remain confidential yet the researchers are able to match present and future surveys to compare data. Each time you are asked to fill out a survey in the future, you will be given this worksheet to help you remember your student ID code. Since your code is known only to you, the researcher cannot remind you of your student code.

Your student ID code is a 4-digit code that is made up of letters and numbers that are correlated to information that is relevant to you. Please follow the instructions below to determine your student ID code.

Your code

1. ____________ ← Enter the third (3rd) letter in your first name.
   (For example: mi**C**helle) C

2. ____________ ← Enter the second (2nd) letter of the month in which you were born. (For example: j**U**ly) U

3. ____________ ← Enter the number of letters you have in your last name.
   (For example: S + M + I + T + H = 5 letters) 5

4. ____________ ← Enter the second (2nd) letter of your last name.
   (For example: s**M**ith) M

Enter the numbers and letters above ____ ____ ____ ____ This is your code.
1 2 3 4

For example: C + U + 5 + M = CU5M

**It does not matter if you use capital or lowercase letters.

APPENDIX C

Demographic Survey

Student Identification Code _____________

Demographic Information

Demographics

____ Male ____ Female

Age _____ Marital Status _____ Number of dependents under the age of 18 ____

County of residence ____________________

Employment: ___ Full time ____ Part time
If employed, number of hours worked per week ________

List any degrees earned prior to this program:
Degree Year Specialty of area of concentration
____
____
____

Have you had previous experience with simulation? Yes/ No

If yes, which type of simulation have you had experience with? (circle all that apply and write in how many hours of experience you estimate that you have had with each)

METI HPS (in the METI lab) ________________________________

METI ECS (in the basic skills lab) ____________________________

Virtual clinical excursion ____________________________________

Case studies ____

CathSim (the IV start simulator) ______________________________

Other ____

Have you had any previous clinical rotations in the hospital on a medical/surgical floor? Yes/ No
If yes, how many days did you have? _____________

Is this your first time being enrolled in NURS 3211: Health Promotion of Adults? Yes/ No

Have you ever had any other experience on a medical/ surgical floor? Yes/ No
If yes, please describe the type of experience (work, as a patient, as a visitor, etc) ______
____

APPENDIX D

Pre-Simulation General Self-Efficacy Scale

Student Identification Code ______________

General Self-Efficacy Scale
Pre-Simulation

For this course you will spend most of your clinical rotations on a hospital medical/surgical floor. Listed below are expected behaviors for satisfactory clinical performance on a medical/surgical floor.

This is questionnaire is designed to determine how confident you are that you can perform each of the following behaviors. Read each behavior and then circle the number to the right of the behavior to indicate how confident you are that you can perform the behavior. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe how you generally feel. YOUR ANSWERS ARE CONFIDENTIAL!

1	2	3	4
Not at all confident	Slightly confident	Moderately confident	Highly confident

1. I can relate knowledge of pathophysiology of the medical diagnosis and ordered treatment plan to the client's condition	1	2	3	4
2. I can perform a complete health assessment for data collection, noting pertinent normal and all abnormal findings	1	2	3	4
3. I can analyze the assessment data to formulate appropriate nursing diagnoses.	1	2	3	4
4. I can establish the expected client outcome, based on realistic expectations of the individualized the client	1	2	3	4
5. I can prioritize the necessary nursing interventions to meet the needs of the client and the family	1	2	3	4
6. I can demonstrate understanding of scientific rationale for planned nursing interventions	1	2	3	4
7. I can provide a safe environment for the implementation of the planned nursing care	1	2	3	4
8. I can demonstrate knowledge and understanding of medications to be administered	1	2	3	4
9. I can administer medications accurately and safely	1	2	3	4
10. I can provide nursing therapies in a safe and appropriate manner	1	2	3	4
11. I can utilize communication skills to establish and maintain a therapeutic relationship with the client and family	1	2	3	4
12. I can report pertinent information to appropriate persons	1	2	3	4
13. I can accept responsibility for total client care	1	2	3	4
14. I can accept responsibility for my own learning and actions	1	2	3	4
15. I can be prepared for clinical experiences	1	2	3	4
16. I can accept guidance from instructors to develop as a professional	1	2	3	4
17. I can maintain confidentiality of client-related information	1	2	3	4
18. I can present my client to my instructor and other students in organized, knowledgeable, professional manner	1	2	3	4

APPENDIX E

Post-Simulation Intrinsic Motivation Inventory

Student Identification Code ______________

Post-Simulation Experience Intrinsic Motivation Inventory

You have just completed a simulation activity (VCE or METI). Consider your thoughts about the activity and for each of the following statements, please indicate how true it is for you, using the following scale. Remember that your answers are confidential.

Please circle which assignment you did today: VCE METI Simulation Lab

1	2	3	4	5	6	7
not at all true			somewhat true			very true

I enjoyed doing this activity very much	1	2	3	4	5	6	7	NA
This activity was fun to do.	1	2	3	4	5	6	7	NA
I thought this was a boring activity.	1	2	3	4	5	6	7	NA
This activity did not hold my attention at all.	1	2	3	4	5	6	7	NA
I would describe this activity as very interesting	1	2	3	4	5	6	7	NA
I thought this activity was quite enjoyable	1	2	3	4	5	6	7	NA
While I was doing this activity, I was thinking about how much I enjoyed it.	1	2	3	4	5	6	7	NA
I think I am pretty good at this activity.	1	2	3	4	5	6	7	NA
I think I did pretty well at this activity, compared to other students.	1	2	3	4	5	6	7	NA
After working at this activity for awhile, I felt pretty competent.	1	2	3	4	5	6	7	NA
I am satisfied with my performance at this task	1	2	3	4	5	6	7	NA
I was pretty skilled at this activity.	1	2	3	4	5	6	7	NA
This was an activity that I couldn't do very well.	1	2	3	4	5	6	7	NA
I put a lot of effort into this.	1	2	3	4	5	6	7	NA
I didn't try very hard to do well at this activity	1	2	3	4	5	6	7	NA
I tried very hard on this activity.	1	2	3	4	5	6	7	NA
It was important to me to do well at this task.	1	2	3	4	5	6	7	NA
I didn't put much energy into this.	1	2	3	4	5	6	7	NA
I did not feel nervous at all while doing this.	1	2	3	4	5	6	7	NA
I felt very tense while doing this activity.	1	2	3	4	5	6	7	NA
I was very relaxed in doing this task.	1	2	3	4	5	6	7	NA
I was anxious while working on this task	1	2	3	4	5	6	7	NA
I felt pressured while doing this task.	1	2	3	4	5	6	7	NA
I believe I had some choice about doing this activity	1	2	3	4	5	6	7	NA
I felt like it was not my own choice to do this task.	1	2	3	4	5	6	7	NA
I didn't really have a choice about doing this task	1	2	3	4	5	6	7	NA
I felt like I had to do this.	1	2	3	4	5	6	7	NA
I did this activity because I had no choice.	1	2	3	4	5	6	7	NA
I did this activity because I wanted to.	1	2	3	4	5	6	7	NA
I did this activity because I had to.	1	2	3	4	5	6	7	NA
I believe this activity could be of some value to me.	1	2	3	4	5	6	7	NA
I would be willing to do this again because it has some value to me.	1	2	3	4	5	6	7	NA
I believe doing this activity could be beneficial to me.	1	2	3	4	5	6	7	NA
I think this is an important activity.	1	2	3	4	5	6	7	NA

I think that doing this activity is useful for ______________________

I think this is important to do because it can _____________________

I think doing this activity could help me to _____________________

APPENDIX F

Post-Simulation/Pre-Clinical General Self-Efficacy Scale

Student Identification Code _____________

General Self-Efficacy Scale
Pre-Clinical/Post-Simulation

You are now ready for your clinical rotation on the nursing floor. You have completed one simulation (VCE or METI) activity in preparation for today. Listed below are expected behaviors for satisfactory clinical performance on a medical/surgical floor.

This is questionnaire is designed to determine how confident you are at this point that you can perform each of the following behaviors. Read each behavior and then circle the number to the right of the behavior to indicate how confident you are that you can perform the behavior. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe how you generally feel. YOUR ANSWERS ARE CONFIDENTIAL!

1	2	3	4
Not at all confident	Slightly confident	Moderately confident	Highly confident

1. I can relate knowledge of pathophysiology of the medical diagnosis and ordered treatment plan to the client's condition	1	2	3	4
2. I can perform a complete health assessment for data collection, noting pertinent normal and all abnormal findings	1	2	3	4
3. I can analyze the assessment data to formulate appropriate nursing diagnoses.	1	2	3	4
4. I can establish the expected client outcome, based on realistic expectations of the individualized the client	1	2	3	4
5. I can prioritize the necessary nursing interventions to meet the needs of the client and the family	1	2	3	4
6. I can demonstrate understanding of scientific rationale for planned nursing interventions	1	2	3	4
7. I can provide a safe environment for the implementation of the planned nursing care	1	2	3	4
8. I can demonstrate knowledge and understanding of medications to be administered	1	2	3	4
9. I can administer medications accurately and safely	1	2	3	4
10. I can provide nursing therapies in a safe and appropriate manner	1	2	3	4
11. I can utilize communication skills to establish and maintain a therapeutic relationship with the client and family	1	2	3	4
12. I can report pertinent information to appropriate persons	1	2	3	4
13. I can accept responsibility for total client care	1	2	3	4
14. I can accept responsibility for my own learning and actions	1	2	3	4
15. I can be prepared for clinical experiences	1	2	3	4
16. I can accept guidance from instructors to develop as a professional	1	2	3	4
17. I can maintain confidentiality of client-related information	1	2	3	4
18. I can present my client to my instructor and other students in organized, knowledgeable, professional manner	1	2	3	4

APPENDIX G

Post-Clinical General Self-Efficacy Scale

Student Identification Code ______________

General Self-Efficacy Scale
Post-Clinical

You have now completed your first week of clinical rotations on a medical/surgical nursing floor. Listed below are expected behaviors for satisfactory clinical performance on a medical/surgical floor.

This is questionnaire is designed to determine how confident you are at this point that you can perform each of the following behaviors. Read each behavior and then circle the number to the right of the behavior to indicate how confident you are that you can perform the behavior. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe how you generally feel. YOUR ANSWERS ARE CONFIDENTIAL!

1	2	3	4
Not at all confident	Slightly confident	Moderately confident	Highly confident

1. I can relate knowledge of pathophysiology of the medical diagnosis and ordered treatment plan to the client's condition	1	2	3	4
2. I can perform a complete health assessment for data collection, noting pertinent normal and all abnormal findings	1	2	3	4
3. I can analyze the assessment data to formulate appropriate nursing diagnoses.	1	2	3	4
4. I can establish the expected client outcome, based on realistic expectations of the individualized the client	1	2	3	4
5. I can prioritize the necessary nursing interventions to meet the needs of the client and the family	1	2	3	4
6. I can demonstrate understanding of scientific rationale for planned nursing interventions	1	2	3	4
7. I can provide a safe environment for the implementation of the planned nursing care	1	2	3	4
8. I can demonstrate knowledge and understanding of medications to be administered	1	2	3	4
9. I can administer medications accurately and safely	1	2	3	4
10. I can provide nursing therapies in a safe and appropriate manner	1	2	3	4
11. I can utilize communication skills to establish and maintain a therapeutic relationship with the client and family	1	2	3	4
12. I can report pertinent information to appropriate persons	1	2	3	4
13. I can accept responsibility for total client care	1	2	3	4
14. I can accept responsibility for my own learning and actions	1	2	3	4
15. I can be prepared for clinical experiences	1	2	3	4
16. I can accept guidance from instructors to develop as a professional	1	2	3	4
17. I can maintain confidentiality of client-related information	1	2	3	4
18. I can present my client to my instructor and other students in organized, knowledgeable, professional manner	1	2	3	4

APPENDIX H:

Electronic Permission to use General Self-Efficacy Scale

Dear Ms. Gilbert

You are welcome to use and adapt this scale as well as all the others that you find at our websites, see below.

See also attachments.

Ralf Schwarzer

At 22:35 02.06.2007, you wrote:

Dr. Schwarzer,

I am writing to ask your permission to use and adapt your General Self-Efficacy Scale in my proposed dissertation. I am in the preliminary planning phases of my research on self-efficacy, intrinsic motivation and human patient simulation in baccalaureate nursing students. I am currently enrolled in the EdD in Curriculum Studies Program at Georgia Southern University in Statesboro, Georgia, USA. I am also an instructor/ second-degree program manager at Valdosta State University in Valdosta, GA.

If you have any questions, please do not hesitate to let me know.

Thank you for your time and consideration,

Michelle Gilbert, RN, MSN
ICAPP Program Manager
College of Nursing
Valdosta State University
229-333-7306
megilber@valdosta.edu

No virus found in this incoming message.
Checked by AVG Free Edition.
Version: 7.5.472 / Virus Database: 269.8.6/828 - Release Date: 01.06.2007 11:22

****
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Personal Website: http://www.RalfSchwarzer.de/
Health Psychology Web: http://www.psyc.de/
Health Psych Dept Web (German) : http://www.fu-berlin.de/gesund/
Health Psych Dept Web (English) : http://www.healthpsych.de
Social Support Scales: http://www.coping.de
Self-Efficacy Scales: http://www.selbstwirksam.de/
****
Psychologie des Gesundheitsverhaltens, 3. Auflage, 2004
http://www.hogrefe.de/buch/isbn/3-8017-1816-6_idx. html

Gesundheitspsychologie, Enzyklopaedie der Psychologie, 2005
http://www.hogrefe.de/buch/isbn/3-8017-1500-0.html /

APPENDIX I:

Valdosta State University Exemption Determination Report

Institutional Review Board

EXEMPTION DETERMINATION REPORT

PROTOCOL NUMBER: 02

PROJECT TITLE: A Comparison of the Effects of Technology and Nursing Simulation on Undergraduate BSN Self-Efficacy

DETERMINATION:

✓ This research protocol is exempt from Institutional Review Board review under Exemption Criterion 1. You may begin your study immediately. If the nature of the research project should change such that exemption criteria may no longer apply, please consult with the IRB Administrator (irb@valdosta.edu) before implementing any changes.

☐ Exemption of this research protocol from Institutional Review Board review is **pending**. You may **not** begin your research until you have addressed the following concerns/questions and the IRB has formally notified you of exemption. You may send your responses to irb@valdosta.edu.

ADDITIONAL COMMENTS/SUGGESTIONS:

Although not a requirement for exemption, the following suggestions are offered by the IRB to enhance the protection of participants and/or strengthen the research proposal**:**

(1) Please change the final paragraph of the Informed Consent letter to say the following:

"Questions about the research and requests for results of the research should be directed to Michelle Gilbert, RN, MSN at 229-333-7306 or megilber@valdosta.edu or Deborah Weaver, RN, PhD at 229-333-7309 or dlweaver@valdosta.edu. This study has been exempted from Institutional Review Board (IRB) review in accordance with federal regulations. If you have concerns or questions about your rights as a research participant, you may contact the IRB Administrator, Barbara Gray, at 229-333-7837 or irb@valdosta.edu. (The IRB is a university committee charged with reviewing research protocols to ensure the safety and welfare of research participants.)"

(2) Suggestion: If sufficient time elapses between participants' completion of the two instruments that could create problems with students remembering which of their likely many PINs they used, you might have them create unique PINs for this study by following a pattern. For instance, they may be instructed to use the first letter of the month in which they were born, the third number of their SSN, the last letter of their middle name, the second letter of the state in which they were born, the third letter of their mother's maiden name, and the last digit of the year in which they were born. (My PIN would be "D9EEA1".) By repeating these clues on the second instrument, they will recreate the same PIN as they used on the first instrument.

If you make any of these suggested changes to your protocol, please submit revisions so that IRB has a complete protocol on file.

Barbara Gray

Barbara Gray
IRB Administrator Date: 1/17/12 *Please direct questions to 229-259-5045.*

APPENDIX J:

Georgia Southern University IRB Approval Letter

Georgia Southern University
Office of Research Services & Sponsored Programs

Institutional Review Board (IRB)

Phone: 912-478-0843 | Veazey Hall 2021
P.O. Box 8005
Fax: 912-478-0719 | IRB@GeorgiaSouthern.edu | Statesboro, GA 30460

To: Michelle Gilbert
Dan Rea
Department of Curriculum, Foundations, and Reading

cc: Charles E. Patterson
Vice President for Research and Dean of the Graduate College

From: Office of Research Services and Sponsored Programs
Administrative Support Office for Research Oversight Committees (IACUC/IBC/IRB)

Initial Approval Date: April 7, 2011

Expiration Date: March 31, 2012

Subject: Status of Application for Approval to Utilize Human Subjects in Research

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After a review of your proposed research project numbered **H11405** and titled **"The Effects of Stimulation on Junior Level Baccalaureate Nursing Students' Self-Efficacy,"** it appears that your research involves activities that do not require full approval by the Institutional Review Board according to federal guidelines.

According to the Code of Federal Regulations Title 45 Part 46, your research protocol is determined to be exempt from full review under the following exemption category(s):

B4 Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that your research is exempt from IRB approval. **You may proceed with the proposed research.**

Please notify the IRB when you have completed the project by emailing irb@georgiasouthern.edu. Include the date of completion, the number of subjects (records) utilized and if there were any unexpected events related to the subjects during the project. (If none, state no unexpected or adverse events occurred during the conduct of the research.)

Sincerely,

Eleanor Haynes

Eleanor Haynes
Compliance Officer