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The Impact of Simulation in Nursing Education on the Self-Efficacy and Learner Satisfaction of Nursing Students

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THE IMPACT OF SIMULATION IN NURSING EDUCATION ON THE SELF-EFFICACY AND LEARNER SATISFACTION OF NURSING STUDENTS

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Abstract

Nursing education faces the challenge of preparing graduates to face the complexities that are found in today's health care environment. Upon graduation, new nurses must be able to care for patients in a fast-paced environment that emphasizes clinical competence and accurate, timely decision-making skills. Self-efficacy is a characteristic that is believed to increase an individual's ability to be successful at a task. The purpose of this study was to evaluate the use of simulation to impact the development of clinical self-efficacy in junior- and senior-level nursing students at a Midwestern liberal arts university. This study also evaluated student satisfaction with simulation as an educational strategy. An evaluation design methodology that was quantitative in nature was utilized for this study. The findings revealed that there was a significant difference in clinical self-efficacy scores from the pre-test to the post-test for both the experimental and the control groups. The findings also indicated that when the two groups were compared to each other, the experimental group had a higher clinical self-efficacy score, but the difference was not statistically significant. The analysis of the data also revealed that there was no significant difference in clinical self-efficacy scores based on the role that the learner played in the simulation. Finally, the analysis of the data revealed that there was a significant difference in learner satisfaction based on the level of the learner. The information obtained from this study will serve to stimulate further research and discussion regarding the use of simulation in nursing education.

Dedication

I dedicate this manuscript to Stan, my husband of 33 years, for his love and support throughout the months and years I have given to this endeavor, and to Elizabeth and Marcus, my children, and to Caleb, Abigail, Aaron, and Liam, my grandchildren, who provided inspiration to their mother and grandmother.

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CHAPTER 1. INTRODUCTION

Nursing education faces the challenge of preparing graduates to face the complexities that are found in today's health care environment. Upon graduation, new nurses must be able to care for patients in a fast-paced environment that emphasizes clinical competence and accurate, timely decision-making skills. The development of clinical competence and decision-making skills is influenced by many factors, including confidence in the ability to accomplish a task or self-efficacy. Self-efficacy is a personal characteristic that is believed to increase an individual's abilities to be successful in a task. Self-efficacy "refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1977, p. 3).

As students matriculate through their educational experiences, they need a strong foundational knowledge and also need learning experiences that will provide them with the opportunities to become confident in their clinical skills and decision-making capabilities. Confidence in clinical skills and decision-making may directly influence students' abilities to care for patients effectively. Upon graduation, many students report that they feel unprepared to face the complexities of the health care work place (Kilstoff & Rochester, 2004).

The overall purpose of this study was to reveal the need for alternative educational strategies that would increase students' confidence, or, self-efficacy. In order to cultivate a learning environment that encourages the development of confidence in the

ability to perform clinical skills and make sound clinical judgments, nursing educators must explore a variety of teaching strategies. The use of teaching strategies where the learner is actively involved in the learning process have been shown to increase learners' self-efficacy (Fencl & Scheel, 2005; Noel-Weiss, Bassett, & Craig, 2006; Slavin, 2003). Simulation is a teaching strategy that has been utilized in nursing education to enable learners to enter the clinical setting better prepared (Lasater, 2007). Simulation places the learner in an active role within the learning environment and simulation also has the ability to provide a learning environment where the learner is able to concentrate on learning without any of the anxiety that may be associated with the clinical setting.

Simulations vary in type and technology utilized. Simulations range in technological complexity from low-fidelity, consisting of case studies or written patient scenarios where students engage in problem-based learning, to high-fidelity, where high-tech mannequins are utilized to generate highly realistic scenarios (Hovancsek, 2007). In the simulation setting, learners are able to learn by experience. Learners focus on a particular situation, assessing, problem solving and making decisions regarding the care of a patient in a realistic, yet simulated environment. The nursing educator who utilizes simulation is able to create a learning environment where the learners can learn from their mistakes without harming a real patient. Also, simulated learning experiences prepare students for the actual clinical setting (Aronson, Rebeschi, & Killion, 2007). By participating in simulated patient care scenarios, students are more comfortable with their own abilities to perform the necessary skills in an actual clinical setting.

As a descriptive evaluation study of the use of simulation in nursing education, this study provided an examination of the impact of simulated learning experiences on

the clinical self-efficacy and learner satisfaction of nursing students. Within this first chapter the topic will be introduced and a background of the problem will be provided. The first chapter will also include a statement of the problem, the purpose of the study, the rationale for the study, the research questions to be examined, and the significance of the study. In addition, terms will be defined, assumptions and limitations will be identified, and the theoretical framework of the study will be introduced. Finally, the organization of the remainder of the study will be presented.

Introduction to the Problem

In addition to the complexities of the current health care environment, nursing educators face the realities of shortages of facilities and faculty. As nursing educators seek effective teaching strategies, they are struggling to do so with fewer clinical resources and fewer faculty. Qualified applicants to programs of nursing are being turned away due to insufficient numbers of faculty and insufficient clinical sites (American Association of Colleges of Nursing, 2005). Educators seek teaching strategies that are effective in preparing students to enter the profession of nursing and they also seek learning environment alternatives to the clinical setting. The alternative learning environments need to depict the clinical environment realistically so that the students will master the necessary competencies and gain the confidence, or self-efficacy, necessary to care for patients in the clinical setting effectively.

In the challenging health care environment of today it is paramount that graduates of nursing programs are able to function effectively in an environment where problem resolution is often complex and time-consuming. Learning environments need to

reflect the appropriate degree of complexity in order for learners to develop a sense of confidence in caring for patients in deteriorating situations. Self-efficacy plays a role in individuals' reactions to difficult situations (Bandura, 1977). Individuals with high self-efficacy will be more task-oriented and will persist, even when the task becomes very complex and difficult (Jackson, 2002).

Simulation environments, effectively created, provide an environment where students experience scenarios that are very similar to the clinical setting. Simulated experiences provide students with opportunities to learn and become comfortable performing a variety of clinical skills prior to caring for patients in actual care settings. Once the students are comfortable with the clinical skills in simulated environments they would possibly be more confident in their ability to perform these skills in actual clinical settings. How the simulated environment impacts students' self-efficacy and learner satisfaction was the basis for this study.

Background of the Study

Schools of nursing are seeking ways to increase enrollment and retention while preparing students to successfully complete the National Council Licensure Examination (NCLEX-RN). The health care industry is depending on schools of nursing to assist in solving the crisis the health care industry is facing as more and more nurses leave the profession. It is estimated that by 2014, "1.2 million RN positions will be needed for growth and replacement" (Walrath & Belcher, 2006, p. 81). In seeking to supply the health care industry with the needed professionals, schools of nursing are also seeking ways to identify students who are at risk for failure, in order to then intervene with

strategies that will enable these students to be successful in completing the academic program and passing the NCLEX-RN. It is important for students to succeed academically and pass the NCLEX-RN. Each student who graduates from a school of nursing must take the NCLEX-RN in order to be licensed to practice nursing professionally. Also, the accreditation of schools of nursing is tied directly to the NCLEX-RN passing rate of students who complete their programs (Nursing Council of State Boards of Nursing, 2006). Schools of nursing seek to prepare students for success and are continually examining factors that may influence each student's academic success. Self-efficacy has been identified as a factor that may impact academic success (Devonport & Lane, 2006; Ofori & Charlton, 2002; Vancouver & Kendall, 2006; Zajacova, Lynch, & Espenshade, 2005).

Bandura (1977) studied the concept of self-efficacy extensively. Bandura examined how individuals approach difficult situations. As individuals approach difficult situations, they study the situations, analyzing the various options open to them while they simultaneously determine their own individual likelihood for success. Bandura believed that self-efficacy directly impacted an individual's ability to be successful at a given task. Bandura identified several ways to build self-efficacy beliefs. One way that self-efficacy beliefs may be cultivated is by individuals experiencing success at a particular task. Another way that self-efficacy beliefs may be cultivated is through individuals observing others successfully performing a task. A further way of enhancing self-efficacy beliefs is through praise and encouragement from others while the individuals are working on the task. A final way that self-efficacy beliefs may be enhanced is by reducing individuals' feelings of anxiety toward the performance of a

certain task. Simulation incorporates many of the methods Bandura identified that could be utilized to increase an individual's self-efficacy.

Simulation has been used effectively in education for many years. Simulation was utilized by industries, such as the airline industry, prior to its use by health-care educators (Wilford & Doyle, 2006). One of the earliest mannequins utilized in simulated learning in the health care industry was Resusci-Annie. Resusci-Annie was introduced in the 1960s as a training aid for cardio-pulmonary resuscitation (Cooper & Taqueti, 2004). Simulation has evolved since the 1960s to the high-tech field that is seen today in several health care simulation learning centers around the country. The high-fidelity simulation mannequins of today provide a realistic "patient" for the learner to care for (Jeffries, 2007). Simulation allows students opportunities to practice skills in an environment where they are free to make mistakes and learn from the mistakes so that when learners enter the clinical setting they feel better prepared to care for their patients. This study focused on the use of simulation in nursing education and its impact on clinical self-efficacy and learner satisfaction.

Statement of the Problem

Nursing students often exhibit a low clinical self-efficacy as they care for patients in clinical settings. Traditionally, extensive clinical experiences have been utilized to increase students' clinical self-efficacy. The shortage of qualified nursing faculty and the decreasing ability of the faculty to provide the necessary clinical settings to meet the students' learning needs has led nursing faculty to investigate alternative teaching strategies.

Purpose of the Study

The purpose of this study was to evaluate the use of simulation to impact the development of clinical self-efficacy in junior- and senior-level nursing students at a Midwestern liberal arts university. This study also evaluated student satisfaction with simulation as an educational strategy. Finally, this study evaluated the impact that the learner's role in the simulation had on clinical self-efficacy and learner satisfaction. The findings from this study serve to provide a broader knowledge base concerning the use of simulation in nursing education.

Rationale

Nursing educators continually seek teaching strategies that will assist them in generating an effective learning environment. Simulation has been utilized effectively as a teaching strategy in several professions, including aviation, engineering, the military, community service and medical (Bradley, 2006; Dy, 2008; Stackpole, 2008; Toon, 2008). Each of these professions has examined ways to make educational experiences more realistic for learners. Additionally, simulation in nursing education has been utilized to supplement the actual clinical experiences of students (Feingold, Calaluce, & Kallen, 2004; Haskvitz & Koop, 2004; Lasater, 2007). Simulation has also been utilized in conjunction with lecture (Anderson, 2007). Educators are seeking a better understanding of how to integrate simulation into nursing curriculums. Research regarding how simulation may be effectively utilized in nursing education is an important component of the knowledge base of nursing education.

Self-efficacy directly impacts performance (Bandura, 1977). Bandura further stated that high self-efficacy results in increased human effort. Accordingly, a nursing student who has high self-efficacy regarding a certain patient care procedure will be more likely to perform that procedure successfully, even under a stressful patient care situation. High self-efficacy will empower the student to persevere, seeking the best care option for the patient.

Several studies have been performed examining simulation and its role in improving learning outcomes (Aronson et al., 2007; Feingold et al., 2004; Morgan, Cleave-Hogg, Desousa, & Lam-McCulloch, 2006). Although some research has been conducted concerning the use of simulation in nursing education to increase self-efficacy, the need has been identified for further studies that examine factors, such as the placement of simulation in the curriculum and the role or participation level of the students in the simulation (Anderson, 2007; Leigh, 2008).

Research Questions

This study addressed the following three research questions:

1. Given the use of simulation in learning laboratory settings, what is the impact of high-fidelity simulation on clinical self-efficacy in junior- and senior-level nursing students?

2. Given the use of simulation in learning laboratory settings, what is the impact of high-fidelity simulation on learner satisfaction in junior- and senior-level nursing students?

3. Utilizing high-fidelity simulation, what is the impact of the role the learners play in the simulation on clinical self-efficacy and learner satisfaction on junior- and senior-level nursing students?

Significance of the Study

The significance of this study serves to assist nursing educators in creating educational environments that incorporate simulation in a manner that could promote the development of clinical self-efficacy in nursing students, thereby increasing nursing students' academic success. The nursing shortage has generated an educational environment where educators are challenged as they seek strategies that will increase students' success in nursing education. Students' self-efficacy will impact their academic success in nursing education. Nursing students who possess high self-efficacy for a particular task or situation will be more likely to continue to be successful with the task or a similar situation. Learning opportunities that allow students to increase their self-efficacy will impact learning outcomes. Simulations that are effectively designed and implemented will allow students to experience first-hand the complexities of the clinical setting in a learning environment where students utilize critical thinking skills as they gain confidence in the ability to provide appropriate patient care.

Definition of Terms

In this study, the following terms were defined:

Clinical self-efficacy - Personal beliefs regarding the ability to successfully carry out clinical nursing tasks necessary to provide appropriate care for the patient in the clinical setting (Owen, 2002).

Debriefing - A time of reflective learning where learners evaluate their decisions and actions in a group setting and integrate the newly constructed knowledge (Lederman, 1992).

Fidelity - A term utilized in simulation. Fidelity "refers to how closely it replicates the selected domain and is determined by the number of elements that are replicated as well as the error between each element and the real world" (Gaba, 2004a, p. 8).

Learner satisfaction - The degree to which the learner believes that the learning experience meets their learning needs. Satisfied learners value their learning experience and will put more effort into their performance (Chickering & Gamson, 1987).

Self-efficacy – "The conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 79).

Simulation – "Activities that mimic reality and variously involve role-playing interactive videos, or mannequins that help students learn and allow them to demonstrate decision making, critical thinking and other skills" (Jeffries & Rogers, 2007, p. 22).

Assumptions and Limitations

There were several assumptions for this study. First, it was assumed that the students' responses on the surveys would be honest. It was also assumed that the students would actively participate in the simulation. It was further assumed that the students who participated in the study were representative of junior- and senior-level nursing students in a baccalaureate nursing program.

There were also several limitations in this study. The sample being utilized was a convenience sample. The size of the sample was small, making the information obtained limited in its usability (Gall, Gall, & Borg, 2007). Also, because only one university was utilized to collect data, the generalizability of the findings is limited.

Nature of the Study

The purpose of this study was to evaluate the impact of simulation as a teaching strategy on clinical self-efficacy and learner satisfaction. Learning that is experientially-based seeks learning experiences that focus on the development of cognition and understanding. Simulations provide a learning environment that actively engages the learner in experientially-based learning activities, where it is acceptable to make mistakes and learn from them. The theoretical framework for this study is drawn from several different learning theorists. The study primarily utilized *The Nursing Education Simulation Framework,* which provided a picture of how teachers, students and educational practices interact with the simulation design characteristics to influence learning outcomes (Jeffries & Rogers, 2007). *The Nursing Education Simulation Framework* is based on constructivist learning theory, along with the theories of Dewey, Schon and Kolb (Jeffries, 2007).

Constructivist learning theory examines how knowledge is acquired through individuals' interactions with the environment. Constructivism places learners in environments where there is active involvement in discovery learning. Learning takes place as learners, who view the learning environment through familiar constructs, assimilate and accommodate new information with old constructs (Henry, 2002).

Dewey believed that new knowledge was generated through interaction with the learning environment (Gutek, 2004). Dewey also believed that the quality of the experience impacted learning. Schon's theory of learning was directly influenced by

Dewey. Schon (1983) emphasized the importance of reflection in the learning process. Reflection seeks to discover new understanding and can be applied in future situations.

Kolb's (1984) theory of experiential learning emphasized that learning is an active process where learners generate new knowledge through experiences. Kolb's theory relies on active learning experiences and reflection on the experiences. It is during the reflective period that new insights are generated and the learner comes to a deeper understanding of the situation.

The Nursing Education Simulation Framework draws from each of these theorists. The framework takes into consideration teacher factors and student characteristics, and emphasizes the use of teaching strategies where the learner is actively engaged in the learning process. The framework also identifies the important role that the simulation design characteristics play in the attainment of the learning outcomes.

Organization of the Remainder of the Study

The report of this evaluation study is comprised of five chapters. Chapter 1 introduces the study. Included in Chapter 1 is the statement of the problem, along with background information regarding the problem. Research questions are also identified, along with the significance of the study. Also found in Chapter 1 are definitions, assumptions and limitations. Finally the theoretical framework that forms the foundation of the evaluation study is identified.

In Chapter 2, topics related to the study are examined. Literature was reviewed and appropriate literature on the identified topics was analyzed. The topics that were reviewed include the use of simulation in nursing education, learning theories utilized to

develop simulations, simulation and learner satisfaction, self-efficacy, and clinical self-efficacy.

In Chapter 3, the evaluation research design is described. The sample and population that was utilized in the study is defined. The instruments that were utilized in data collection are described. Finally, the data collection methodology is described.

In Chapter 4, an analysis of the data is presented in various appropriate formats. The report of the study concludes with Chapter 5, where conclusions are drawn from the findings are presented, along with recommendations for further research.

CHAPTER 2. LITERATURE REVIEW

This chapter presents the review of the literature regarding simulation and self-efficacy. Literature related to the history of simulation, learning theories utilized in the development of simulations and the use of simulation in the education of health care professionals was reviewed. The concept of self-efficacy was examined from a theoretical perspective as well as how self-efficacy may influence the academic success of students. Finally, the literature regarding clinical self-efficacy was reviewed with an emphasis on the impact simulation may have on enhancing the development of clinical self-efficacy.

Simulation

Simulation has been defined by several researchers. Simulation was defined by Jeffries and Rogers (2007) as "activities that mimic reality and variously involve role-playing interactive videos, or mannequins that help students learn and allow them to demonstrate decision making, critical thinking and other skills" (p. 22). Educational simulation was also defined by Hertel and Millis (2002) as "sequential decision-making classroom events in which students fulfill assigned roles to manage discipline-specific tasks within an environment that models reality according to the guidelines provided by the instructor" (p. 15). Rauen (2004) defined simulation as "an event or situation made to resemble clinical practice as closely as possible" (p. 46). Gaba (2004b) defined

simulation as "a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion" (p. 2). Each definition stressed the importance of the simulation being realistic. Gaba stated that simulation was a technique, not a technology, emphasizing the importance of simulation as an educational strategy. Jeffries and Rogers spoke of simulation as an activity that promotes learning. For the purposes of this study, Jeffries and Rogers' definition was utilized.

History

Simulation in health care education has a long history. Sim One, the first patient simulator to be computer controlled, was developed in the 1960s. Sim One proved not to be cost effective (Cooper & Taqueti, 2004). Other early patient simulators included Harvey, a cardiology patient simulator and Case, an anesthesia patient simulator. More technologically advanced simulators have been utilized in health-care professional education for over 15 years (Seropian, Brown, Gavilanes, & Driggers, 2004). It was the introduction of high-fidelity simulators that brought about a transformation in teaching strategies for the health care professions.

Several types of simulators have been identified as being utilized in nursing education. Simulators that have been used in nursing education range from low-fidelity simulators to high-fidelity simulators. Low-fidelity simulators consist of static models and lack the realistic qualities of high-fidelity simulators (Seropian et al., 2004). Low-fidelity simulators have been utilized quite effectively by students to practice psychomotor skills in a controlled environment. Moderate-fidelity simulators may have heart sounds or lung sounds that the students may listen to, but they lack the realism of

high-fidelity simulators where the chest rises and falls as each respiration is taken. High-fidelity simulators have the most realistic physical appearance and have realistic physiological responses and have been in use since the 1990s, when human patient simulators became more affordable and life-like (Hovancsek, 2007).

Learning Theories

Simulation is theoretically based on several learning theories. Hertel and Millis (2002) stated that simulation is rooted in experiential learning theory. Simulation places students at the center of the learning experience and allows students to construct new knowledge and also gain knowledge from fellow learners' experiences. In the design of the *Nursing Education Simulation Framework,* Jeffries and Rogers (2007) utilized Kolb's experiential learning theory, Schon's theory on reflection, and constructivist learning theory. This section will review the literature as it relates to experiential learning theory, Schon's theory on reflection, and constructivist learning theory and apply these learning theories to the *Nursing Education Simulation Framework* developed by Jeffries and Rogers.

Experiential Learning. Kolb (1984) wrote extensively regarding experiential learning. Kolb's theory of experiential learning described learning as "a holistic integrative perspective on learning that combines experience, perception, cognition, and behavior" (p. 21). Kolb's model of experiential learning was circular in nature and revolved around four stages; concrete experience, reflective observation, abstract conceptualization and active experimentation. The circular nature of Kolb's model emphasized the continual learning process that occurs throughout experiential learning.

Kolb's theory of experiential learning emphasized the importance of the reflective observation stage. This stage has been described as a stage where new knowledge is generated. In simulation, reflection occurs during the simulation and during the debriefing time.

Reflection. The process of reflection was described by Gibbs (1988) as being divided into six stages. The first stage consists of describing the learning experience. The second stage involves the learner examining his or her feelings during the experience. The third stage consists of the learner identifying the positive and negative aspects of the experience. Stage four, or the analysis stage, allows the learners the opportunity to analyze the experience, drawing knowledge through analysis. Stage five involves learners identifying how they could have modified their actions to enhance the outcomes of the learning experience. The final stage, or stage six, consists of the learners developing an action plan regarding how they would deal with the experience in the future.

The importance of the process of reflection in relation to learning was emphasized by both Dewey and Schon. Dewey viewed the world as a constantly changing learning environment where the learner generates new knowledge through interaction (Gutek, 2004). Dewey (1938) stated that new knowledge was constructed through the process of reflection on the interaction. Further, Dewey believed that the process of reflection was an active learning process that leads to problem resolution (Miettinen, 2000). Schon (1983) expanded on Dewey's thought regarding reflection and differentiated between reflection during the experience and reflection on the experience. Additionally, Schon (1987) stated that the reflective experience was based on experiential learning principles. Reflection during the experience allows learners to apply theoretical knowledge in an

interactive environment as they solve problems with appropriate coaching from a facilitator. The reflective learning environment also involves the process of reflection on the experience. Students utilizing reflection on the experience are able to view a clinical situation following resolution, paying particular attention to their decision-making process during the clinical situation. It is during the reflection on the experience that students critique their decisions and determine if alternative decisions should have been considered. Both the process of reflection during the experience and the process of reflection on the experience may be built into simulation experiences. The reflection during the experience may be broadened with coaching from a facilitator and the reflection on the experience may be accomplished through the process of debriefing.

Debriefing, or the reflective process of simulations, has been identified as vital to the learning experience (Ericsson, 2007). Ericsson stated that the immediacy of debriefing and feedback was necessary to ensure performance improvement. The facilitator has been identified as a major figure in the debriefing process. Lasater (2007) stated that the facilitator, during the debriefing period, guides the students as they examine the simulation, reflecting on what care was provided to the patient and what changes they would make in the future. It has been reported that during the debriefing period, which involves analysis of the simulation, new knowledge generation takes place (Parsons & White, 2008; Seropian et al., 2004).

Constructivism. Constructivism originated from the theories of Piaget, Vygotsky, Bruner, Gardner, and Goodman (Ozmaon & Craver, 1999). Learning, according to constructivist theory, occurs as students view the learning environment through familiar constructs, assimilating and accommodating the new information with their existing

constructs (Henry, 2002). Slavin (2003) stated that students construct new knowledge through discovery and transformation of information. Slavin also stated that the quality of the experience and effective coaching from the facilitator will impact the learning experience. In order to generate significant learning experiences, students should be presented with realistic, complex learning experiences, along with sufficient guidance in order to achieve success.

Henderson (1996) also examined learning strategies utilizing constructivist learning theory. Henderson stated that teaching strategies that are grounded in constructivist theory are defined as any "deliberate, thoughtful educational activity that is designed to facilitate students' active understanding" (p. 6). Simulations have been described as being based on constructivist learning principles. Simulations have been depicted as significant learning experiences, where the learners are placed in the center of the learning experience. Jeffries and Rogers (2007) stated that simulations allow learners to experience learning while they develop new constructs and understanding of the theoretical concepts presented in the didactic portion of the class. The simulation theoretical framework developed by Jeffries (2007) is partially based on constructivist learning principles.

The Nursing Education Simulation Framework. Jeffries (2007) designed *The Nursing Education Simulation Framework,* incorporating the learning theories of experiential learning, reflection, and constructivism. *The Nursing Education Simulation Framework* visually depicts the collaborative relationship between the educator and the students and further depicts how this collaborative relationship and the design characteristics of the simulation impact learning outcomes. Within this framework, the

educator functions as a facilitator, working with students who are expected to be self-directed, active participants in the learning experiences. The simulations are designed with specific objectives in mind. The fidelity utilized within the simulations must be appropriate for the objectives. The simulations are also designed to promote problem solving skills while providing support to the students. The debriefing period that concludes the simulation focuses on learning outcomes while making a direct connection to clinical practice.

Simulation Use in Health Care Professions Education

Simulations have been utilized for a variety of purposes in the education of various health care professionals. Physicians, nurses, pharmacists and emergency medical technicians have benefited from simulations in their professional preparation (Ericsson, 2007; Haskvitz & Koop, 2004; Marshall et al., 2001). Simulations have been utilized as assessment tools, teaching and learning strategies, and evaluations tools. Nehring and Lashley (2004) conducted an international survey of 34 schools of nursing that were utilizing the Medical Education Technologies (METI) Human Patient Simulator (HPS) regarding how the faculty was utilizing simulation in their curriculums, the training of faculty regarding the use of the simulator, and learners' opinions of the use of simulation. Nehring and Lashley reported that the schools of nursing surveyed were utilizing METI HPS in physical assessment classes and medical surgical and nurse anesthesia classes. These authors also reported that the schools were interested in utilizing the METI HPS for enhancing critical thinking and clinical judgment skills, and for increasing learners' confidence levels in their abilities to care for patients in the clinical setting. Finally,

Nehring and Lashley reported that students expressed satisfaction with the inclusion of simulations in their learning experiences.

Although simulations have been utilized in a variety of ways, ramifications of introducing simulations into the curriculum must be considered. Nursing educators have examined the ramifications of incorporating simulation experiences into the curriculum. Researchers have identified several possible positive consequences of introducing simulations into the curriculum. McGaghie, Issenberg, Petrusa, and Scalese (2006) identified simulation experiences as being advantageous to student learning. Through the use of simulation experiences, nursing educators are able to replicate the clinical environment, thus providing the students a learning environment that is controlled yet realistic. Students are able to practice various skills and care for a variety of patients. Bruce, Bridges, and Holcomb (2003) reported that simulations that incorporate reflection or debriefing into the simulation experience have the ability to link theory to practice, thus possibly increasing the learner's clinical judgment skills.

Although the use of simulation experiences is increasing in health care professional curriculums, there are several challenges that have been identified in the literature regarding the use of simulations. One of these identified challenges is the funding for the equipment necessary to run realistic simulations (Harlow & Sportsman, 2007; Haskvitz & Koop, 2004). In addition to the cost of the equipment, other challenges have been identified, including the cost of necessary renovations to create sufficient space for the equipment, the training of personnel, and the development of curriculum that includes simulation throughout the curriculum (King, Hindenlang, Moseley, & Kuritz, 2008; Radhakrishnan, Roche, & Cunningham, 2007; Rauen, 2004; Seropian et al.,

2004). Many of the challenges that involve funding have deterred some schools of nursing from incorporating simulation experiences into their curriculums.

The challenge of training personnel has affected some schools of nursing as well. Seropian et al. (2004) stated that many schools of nursing desire to include simulation in their curriculum but lack the knowledge base to do so. King et al. (2008) also reported that faculty members often lack the expertise to utilize human patient simulators effectively. Seropian et al. suggested that schools desiring to include simulation in their curriculums develop a vision and a plan to facilitate the phasing-in of simulation. Starkweather and Kardong-Edgren (2008) described how simulation had been introduced into the curriculum of their nursing program and the evaluation process that followed the introduction. The university involved in the study began by introducing simulation into the junior-level nursing courses prior to the students' first clinical experiences. Novice students were provided with scenarios, utilizing low-fidelity human patient simulators, that emphasized communication, safety and foundational skills. The students expressed satisfaction with the experience. The study noted that simulation was being integrated into all courses within their curriculum.

Maran and Glavin (2003) identified an additional challenge about utilizing high-fidelity simulators. They identified the inability of the high-fidelity simulator to present subtle clinical cues realistically, such as facial expression, muscle tone, and skin color changes, as well as other cues that clinical practitioners look for when evaluating a patient. Faculty members are left to decide how to generate simulations that are realistic, keeping in mind the limitations of human patient simulators. Pittini et al. (2002) also addressed the issue of realism when they conducted a study regarding teaching students

how to perform an amniocentesis. The study reported that the simulations developed were effective in teaching the skill of performing an amniocentesis but it was suggested that additional research be conducted to determine if the knowledge gained during the simulation would transfer to the actual clinical setting.

Despite the challenges presented in the use of simulators, simulators have been utilized by health care professional educational programs to facilitate student learning in a variety of settings and manners. Simulations have been utilized to assess learning and the degree of clinical competence learners have attained. Simulations have also been utilized to teach new concepts and to assist students when remediation is necessary. The next section will present a review of the literature related to the utilization of simulation in health-care professional educational programs.

Simulation Use in Assessment and Evaluation. Simulations have been utilized as assessment tools in medical education (Schuwirth & Van der Vleuten, 2003). In utilizing simulations as assessment tools, Schuwirth and Van der Vleuten noted that it was very important to make the simulation reflective of the actual clinical setting and to limit the length of the simulation in order to assess the student's performance effectively. Adler, Trainor, Siddall, and McGaghie (2007) conducted a quantitative study examining the use of high-fidelity simulation to assess the clinical competency of pediatric medical residents. The authors concluded that high-fidelity simulation was effective in the identified situation to assess the clinical competency of pediatric medical residents. Adler et al. also identified the need for valid and reliable tools to measure clinical competence. Decker, Sportsman, Puetz, and Billings (2008) examined how simulation had been utilized in the past to assess levels of competency. They concluded that in order to utilize

simulation for assessing competency, educators need to acquire the necessary knowledge and skills needed, realistic case scenarios must be developed and validated, and that reliable and valid testing measures must be developed.

Simulation as a Learning Strategy. Simulation has been utilized as a learning strategy in several different health care professions educational programs (Larew, Lessans, Spunt, Foster, & Covington, 2006; Haskvitz & Koop, 2004). When educators consider integrating simulation into curriculum, researchers suggest that the simulation experiences move from simple to complex. Medley and Horne (2005) emphasized that simulations must be leveled as they are placed in the curricula so that students move from simple scenarios dealing with foundational skills to complex scenarios that deal with critical care concepts. Medley and Horne further suggested that a simulation capstone experience be added to the final semester of the curriculum to aid the students in further development of their critical thinking skills.

Simulations have also been utilized to increase nursing students' skills competency levels. Radhakrishnan et al. (2007) conducted a quasi-experimental study to evaluate the impact of simulation on clinical performance. The sample was divided into two groups, with the intervention group receiving simulation experiences. The simulation consisted of caring for two complex patients at the same time. Both groups' clinical performance was assessed at the end of the course. The findings included that the intervention group scored higher in safety and basic assessment skills. The sample size of this study was small, consisting of only 12 students. Further, no attempt was made to assess student performance prior to instruction.

Simulations have been utilized to teach new skills to students and to allow students to practice caring for a variety of patients with complex medical diagnoses (Parsons & White, 2008). The University of Maryland Baltimore School of Nursing utilized simulations to provide students with the opportunity to practice various technical skills and decision-making skills utilizing a standardized simulation protocol (Larew et al., 2006). Reilly and Spratt (2007) also conducted a study examining the use of simulation with novice students. The study was qualitative in nature and the students reported that they felt the simulations assisted them in developing clinical competence prior to entering the actual clinical setting.

Simulations have also been utilized in medical schools to increase skill competency levels. Marshall et al. (2001) examined the use of high-fidelity simulation in the development of trauma management skills in residents. The findings of this quantitative study revealed that trauma management skills improved, with the greatest improvement in team behavior. Issenberg et al. (2002) conducted an experimental study that examined the impact of simulation on the cardiology assessment skills of medical students. The authors concluded that simulation aided in significantly improving the cardiology assessment skills of medical students quickly and efficiently with few faculty resources expended. Morgan et al. (2006) examined the impact of high-fidelity simulation on the use of resuscitative drugs when cardiac arrhythmias are present. The quantitative study was conducted with a sample of anesthesiology students. Morgan et al. found that the use of high-fidelity simulation improved the clinical management skills of the students. The authors concluded that high-fidelity simulations may have the ability to assist students in transferring theory knowledge to the clinical setting.

High-fidelity simulation experiences have also been utilized with pharmacy students. Seybert, Laughlin, Benedict, Barton, and Rea (2006) evaluated the use of simulation to supplement didactic instruction regarding medications utilized during a myocardial infarction. The simulation experience was evaluated utilizing a debriefing tool that graded the students' performances and a survey tool that elicited feedback on the experience from the students. The findings of this study revealed that the average grade on the simulation was 88%, which reflected that the students had acquired the necessary knowledge. The findings from the student survey revealed that 93% of the students felt that the simulation experience allowed them to transfer knowledge from the didactic portion of the course to the simulation. The majority of the students felt that simulation experiences should continue to be incorporated into the curriculum.

Simulations have also been utilized to assist students from various health care professions with remediation experiences. Haskvitz and Koop (2004) developed a remediation plan involving high-fidelity simulation for graduate level anesthesia students. They found that the high-fidelity simulation provided an alternative to the clinical environment that ensured patient safety and allowed students to practice until a certain level of proficiency was met. Haskvitz and Koop stated that the repetitive practice would allow students to become more confident in their ability to perform the skills. Haskvitz and Koop also identified disadvantages to simulations. They stated that since simulations do not take place in the actual clinical setting, students do not take the simulation seriously. They also identified the cost of simulation equipment as a disadvantage.

Simulations have also been utilized to create scenarios that are not readily obtainable in the actual clinical settings. Lindsay (2008) combined lecture and simulation

to present the topic of pediatric death. Following a lecture on pediatric resuscitation and pediatric death, the students participated in a high-fidelity simulation involving an infant who required resuscitation and eventually died. Lindsay utilized a Likert-scale instrument to evaluate the teaching strategy quantitatively and a comment section to gather qualitative data regarding the experience. The quantitative data revealed that students thought the combination of lecture and simulation was an effective teaching strategy. The qualitative data revealed that students felt better prepared to function in a pediatric crisis situation.

In utilizing simulation in place of the actual clinical setting, nursing educators have assumed that the knowledge acquired in the simulation will transfer to the clinical setting. In addressing this question, Feingold et al. (2004) conducted a descriptive study examining both the use of high-fidelity simulation and faculty and student satisfaction with the learning experience, and whether faculty members and students felt they would be able to transfer the knowledge gained into the clinical setting. Their findings revealed that only half of the students believed that the knowledge they had acquired during the simulation would transfer to the actual clinical setting, but the entire faculty believed that the knowledge acquired during the simulation would transfer to the actual clinical setting.

Simulation has also been utilized to assist students in the development of clinical judgment. Lasater (2007) conducted a qualitative study utilizing focus groups following the simulation experience. The simulation experiences consisted of complex medical-surgical patient care scenarios. Lasater reported that during the focus groups several themes emerged. Students felt that the scenarios required them to reflect on what they had learned and apply that knowledge to the patient care scenarios. Students stated that

they felt anxious, but that they felt the anxiety heighted their awareness of the situation, allowing them to learn from both their correct actions and mistakes. Rauen (2004) stated that simulation provides students with the opportunity to apply knowledge and skills and utilize critical thinking skills to solve problems as they care for the patient. Rauen described how Georgetown University and Georgetown University Hospital worked together to use simulation experiences for students and for orientations to critical care. Simulations were utilized to allow the students and orientees to experience caring for patients in a critical care setting without risk to actual patients. No statistical data was presented, but Rauen reported that the participants felt positive about the experience. McCausland, Curran, and Cataldi (2004) also described how simulation was utilized to assist students who encounter complex patient situations to collect data, analyze the data and make clinical judgments. A Likert-scale instrument was utilized to assess the students' evaluations of the simulation experience. Overall, the students believed their experiences were positive. The students also stated that they believed that they would be able to apply the new knowledge to future, actual patient care scenarios. This study lends possible credibility to the effective use of simulation to assist students with the transfer of knowledge from the simulation to the actual clinical setting as students' beliefs in their abilities to accomplish tasks directly influences the outcome of the tasks. Cioffi, Purcal, and Arundell (2005) also examined the impact of simulation on clinical decision-making skills. Their experimental study compared an intervention group that participated in two simulation scenarios and lecture and a control group that only participated in the lectures. The findings revealed that the intervention group gathered more clinical information, had higher confidence levels, and made clinical decisions quicker.

Simulations have also been utilized to promote effective functioning of interdisciplinary health care teams. A group of Norwegian researchers, Wisborg, Brattebo, Brattebo, and Brinchmann-Hansen (2006) designed a simulation to assist trauma teams to function effectively during a trauma event. One of the main reasons for designing a simulation with this type of scenario was that Norwegian hospitals infrequently receive trauma patients. A questionnaire was administered to the teams before and after the training. The questionnaire consisted of a self-reporting evaluation of whether or not educational expectations were met and the learners' perception of learning that took place. Participants who participated in both the didactic portion of the course and the simulation experience followed by debriefing expressed a higher level of satisfaction with the experience than those who only participated in the didactic portion of the course.

Simulations have been utilized in health care professional education for a variety of purposes. Questions have been raised by researchers regarding the ability of simulations to be realistic enough so that the knowledge obtained from the simulation will transfer to the actual clinical setting. Researchers have identified the need for valid and reliable tools when simulation is used for assessment or evaluation. Educators have also raised questions regarding the cost effectiveness of simulation. Educators question whether the learning experience provided with simulation is effective. In most of the studies reviewed, the learners felt that simulation was a positive learning experience.

Simulation and Learner Satisfaction

Educators want the educational experiences provided for the students to be significant learning experiences where the learners are actively engaged in satisfying

learning experiences. Chickering and Gamson (1987), in their writings regarding the seven principles of good practice in undergraduate education, stated that students who had satisfying learning experiences performed at a higher level. Several studies have been conducted regarding learner satisfaction with high-fidelity simulation. Studies have been conducted utilizing participants from various education levels. Seriopian et al. (2004) stated that when comparing the different types of simulation experiences from low-fidelity to high-fidelity, students prefer utilizing high-fidelity simulations to complement their learning experiences.

Foster, Sheriff, and Cheney (2008) examined learner satisfaction regarding the use of simulation as a teaching strategy in a simulation scenario involving caring for a patient with a pulmonary embolism. Learners agreed (96.3%) that the addition of the simulation experience as a supplement to lecture was a positive and effective experience. Peppler, Dannhausen, and Willock (2007) described a personal experience with simulation as a student. The experience was described as beneficial and the desire for more such experiences was expressed. There was no statistical data presented to document this opinion. Kuznar (2007) conducted a descriptive study regarding associate degree learner satisfaction with high-fidelity simulation. Kuznar found that, overall, learners were satisfied with the learning experience provided by the high-fidelity simulation and that they felt the experience was reflective of the clinical setting. Kuznar further reported that the students felt the simulation experience increased their confidence level regarding caring for this type of patient in the clinical setting.

Bantz, Dancer, Hodson-Carlton, and Hove (2007) also addressed the topic of learner satisfaction as they described an educational opportunity that was provided to

their students in an obstetrical course. Students spent a day in the clinical laboratory at the university going through eight simulation stations. Each station consisted of a component of care provided to either the laboring patient, the newborn, or the postpartum patient. The students completed an evaluation form following the experience and expressed satisfaction with the experience. The study did not present statistical information or information regarding the reliability of the tool utilized to collect data.

Bremner, Aduddell, Bennett, and VanGeest (2006) conducted a mixed methods study that examined novice students' perceptions of the value of high-fidelity simulation experiences. Students were asked about the teaching/learning utility, the realism, any limitations and the students' confidence/comfort level. The study found that 61% of the students believed the experience helped them gain confidence in their physical assessment skills and 42% believed that the simulation experience helped to reduce the stress that comes with the first day of clinical. The qualitative data revealed that the simulation experience helped students identify areas of remediation that were needed.

Jeffries and Rizzolo (2006) also examined the concept of learner satisfaction in a study they conducted comparing the use of high-fidelity simulation with a paper-and-pencil case study. The scenario utilized in this study consisted of caring for a postoperative patient. The findings demonstrated that the students were more satisfied with the high-fidelity simulation than they were with paper-and-pencil case study.

Fink (2003) emphasized the importance of learners being actively engaged in satisfying significant learning experiences. Fink stated that the results of significant learning experiences include preparing students for the realities of the world. Fink also

emphasized the importance of students developing the desire to become life-long learners through actively taking charge of their learning.

The research reviewed indicated that learner satisfaction was an important concept to consider when creating and evaluating learning experiences. When students participate in satisfying learning experiences they may put more effort into learning and persist longer when the learning environment is challenging. Satisfying learning experiences, where students are actively engaged in their learning may assist in increasing students' self-efficacy.

Self-Efficacy

Theoretical Background of Self-Efficacy

Bandura (1986) described self-efficacy as the confidence an individual has to successfully accomplish a task. Bandura further stated that self-efficacy is influenced by experiences both past and present, observations of others, verbal encouragement and psychological factors such as fear or anxiety. Bandura (1977) also believed that self-efficacy directly affected the tasks individuals chose to attempt, the effort put into the task and the length of time spent working on task completion. Bandura (1986) proposed that repeated task success would increase self-efficacy while failure would decrease self-efficacy but also proposed that the decrease in self-efficacy could be mediated by strong feelings of self-efficacy. Schunk (1984), like Bandura, believed that self-efficacy could be influenced vicariously but that the impact on self-efficacy would be weaker. Schunk elaborated on Bandura's theory, stating that self-efficacy is related to self-motivation. Both Bandura and Schunk believed that individuals who possess high self-efficacy would

be self-motivated, seeking alternative paths to performance success. Schunk further wrote about motivation and learning, stating that strong self-efficacy regarding the ability to process information will directly impact learners' motivation and learning.

Bandura (1977) stated that individuals with strong self-efficacy viewed difficult tasks as challenges and the individuals would work longer and harder on the tasks in order to be successful. In 1989 Bandura also wrote about some of the characteristics of individuals with high-self-efficacy. Bandura stated that individuals with high self-efficacy visualize success and rehearse scenarios in their minds that will assist them in attaining success. In 1989 Bandura also linked individuals' perceptions of their abilities to problem solve with their self-efficacy. Individuals with high self-efficacy regarding their abilities to problem solve will be able to utilize their analytical skills in complex situations.

Bandura (1989) stated that individuals' self-efficacy will impact the amount of stress they experience when faced with a complex situation. The impact of learning strategies on self-efficacy was identified by Corno and Mandinach (1983). Corno and Mandinach believed that when learners view certain learning strategies as being successful, the learners feel a sense of control over their learning outcomes which acts to increase self-efficacy. Corno and Mandinach, along with Schunk (1984), stated that learners who find certain learning strategies to be successful will be motivated to continue to utilize these strategies.

Self-Efficacy and Health Care Professional Education

Most of the research regarding the health care field and self-efficacy was found to be related to topics of chronic illness and health-promoting behaviors such as smoking

cessation. Less research was found related to self-efficacy and health care professionals' education. The research was primarily based on the theories of Bandura. Harvey and McMurray (1994) elaborated on Bandura's theory, customizing it to the profession of nursing. Harvey and McMurray stated that "nursing self-efficacy involves expectations of learning the knowledge base and performing the various skills necessary to become a registered nurse" (p. 472). In order to be successful in their academic pursuits, students need to acquire the necessary knowledge base and apply the knowledge base to the clinical setting. Nursing educators are concerned about academic self-efficacy and clinical self-efficacy. The following sections will review the literature related to the concepts of academic self-efficacy and clinical self-efficacy along with studies regarding learning strategies that may increase students' self-efficacy.

Academic Self-Efficacy

Academic self-efficacy was defined by Schunk (1991) as a student's belief in his or her ability to accomplish the academic tasks at a given level. Schunk stated that the variability of initial academic self-efficacy is based on a student's aptitude and past experiences. Schunk further postulated that as students progress successfully through designated academic tasks, their level of motivation increases. Zimmerman (1986) operationally defined academic self-efficacy as students' beliefs in their ability to perform identified academic self-regulatory behaviors.

Self-efficacy has been examined to determine its impact on academic success. Studies that have been conducted have reported findings that support the concept of a relationship between academic self-efficacy and college grades, and persistence in college work and retention (Multon, Brown, & Lent, 1991). Self-efficacy has been found

to impact academic performance positively (Jackson, 2002). Jackson examined how communication that was designed to cultivate self-efficacy beliefs between the teacher and the learner would impact academic performance. Jackson found that communication that cultivated learners' self-efficacy beliefs acted to improve the test grades of introductory college psychology students.

Gore (2006) conducted a study in order to examine the impact of academic self-efficacy beliefs on college outcomes. The results revealed that academic self-efficacy may predict outcomes but the ability to predict outcomes is partially dependent on the academic year of the students and the measurement tool utilized. Gore found that self-efficacy beliefs are more strongly related to academic outcomes in college students with at least one semester's experience.

The academic self-efficacy of nursing students has also been examined. McLaughlin, Moutray, and Muldoon (2008) conducted a longitudinal study that examined what impact the role of personality and self-efficacy had on nursing students' academic success. Students completed questionnaires during their first years of nursing school and retention rates and grades were tracked throughout a three-year period. This study concluded that, in regard to self-efficacy, students with a high occupational self-efficacy score were more likely to have better grades. An interesting finding in the study was that no significant differences were found in self-efficacy scores between the group that completed the program and the group that did not complete the program. Due to the problems that the shortage of nurses is generating in the health-care industry, schools of nursing are looking at factors that will predict success and will identify students. By identifying students who are at risk, educators may be able to intervene so that these

students may then be able to complete their programs. Harvey and McMurray (1994) also examined the issue of academic success and self-efficacy and reported that students who dropped from the nursing program were more likely to have low academic self-efficacy. According to the findings of these two studies, academic self-efficacy may be a better predictor of success in nursing education than occupational self-efficacy, but occupational self-efficacy may be a predictor of higher grades.

Clinical Self-Efficacy

Clinical self-efficacy refers to more than just a knowledge base. Clinical self-efficacy refers to individual beliefs regarding the ability to carry out the clinical nursing tasks necessary to provide appropriate care for the patient in the clinical setting (Owen, 2002). Clinical self-efficacy is an important component of nursing education and may impact the ability of students and nurses to provide adequate care for patients. Lundberg (2008) stated that self-efficacy plays a major role in whether or not nursing students will make a successful transition to caring for patients effectively in the clinical setting.

Lundberg (2008) further stated that learning experiences that are designed to increase self-efficacy should be realistic, provide appropriate feedback in a timely manner, include examples of appropriate care, and that the experience should allow time for students to practice giving care to patients in a controlled environment. Lundberg's ideas of appropriate learning experiences follow the theory proposed by Bandura (1986) regarding self-efficacy. Bandura stated that self-efficacy is influenced by experiences, observations of others, verbal encouragement and psychological factors, such as fear or anxiety. The learning experience described by Lundberg may be developed utilizing a

variety of strategies. The next section will review the current literature as it relates to learning strategies designed to increase clinical self-efficacy.

Learning Strategies and Self-Efficacy

The review of the literature revealed a variety of learning strategies that may impact the development of clinical self-efficacy. Each of the strategies identified involved learning experiences that actively engaged the learner, drawing on Bandura's thoughts regarding how self-efficacy is developed. The learning strategies reviewed included preceptorship, case study, role play, computer assisted instruction, clinical rotations, and simulation.

Preceptorship. Goldenberg, Iwasiw, and MacMaster (1997) examined the impact of a preceptorship program on students' self-efficacy in regard to providing identified patient care procedures. The researchers found that the preceptorship program had a positive impact of the students' self-efficacy. The study also indicated that the quality of the preceptorship experience depended on the receptiveness of the preceptor to facilitating the student's learning experience.

Case Study and Role Play. Goldenberg, Andrusyszyn and Iwasiw (2005) conducted a descriptive study that examined the impact of case study and role play on students' self-efficacy in regard to health teaching. The authors of this study concluded that case study and role play increased self-efficacy scores of the students who participated in the two classroom simulations. The authors further stated that the findings of this study are not generalizable due to the low returned questionnaire rate (33%) from the small, non-randomized sample.

Clinical Rotations. Laschinger, McWilliam, and Weston (1999) conducted a quantitative study that explored the impact of clinical rotations on nursing and medical students' self-efficacy for health promotion counseling. This study reported that self-efficacy was measured three times during the study: at the beginning of the study, after the clinical rotations, and three months following the rotations. The authors concluded that the nursing students' self-efficacy was increased while the medical students' self-efficacy remained the same. Laschinger et al. proposed that these differences may be related to the emphasis that is placed on health promotion counseling in the two different curriculums. They suggested that further research be conducted to identify the reasons for the differences identified by this study.

Lundberg (2008) stated that in order for students to become confident in their clinical skills, part of the students' learning experiences need to take place in the clinical setting. Lundberg goes on to emphasize the impact that peer modeling may have on students' self confidence. Lundberg suggested pairing a clinically confident student with a student who lacks clinical confidence. Students who are less confident will see how the confident student performs in the clinical setting and thus may increase their own self confidence.

Computer-Assisted Instruction and Online Instruction. Madorin and Iwasiw (1999) examined the impact of computer-assisted instruction (CAI) on the self-efficacy of nursing students. The findings of this study revealed that the students who participated in CAI had higher self-efficacy immediately following the CAI but did not have significantly higher self-efficacy scores at the end of the course, indicating that the impact of CAI diminished over time.

Babenko-Mould, Andrusyszyn, and Goldenberg (2004) conducted a quasi-experimental study that examined the impact of computer-based clinical conferencing on nursing students' self-efficacy. The intervention group of students in the study participated in clinical conferencing that was conducted in an online environment, while the control group participated in the traditional form of face-to-face post-conferences. The authors found no significant difference in the self-efficacy of students regarding clinical competencies but found that both groups had increased self-efficacy regarding clinical competencies. Additional research was suggested in the area of online learning strategies to supplement classroom and clinical instruction.

Docherty, Hoy, Topp, and Trinder (2005) also examined the effectiveness of web-based, online learning, or eLearning. In this study, one group of students received traditional instruction that was supplemented with problem-based learning scenarios. The eLearning group participated in online discussions and utilized various web pages, receiving video links and other resources that supplemented the problem-based learning environment. The authors reported that that the students who participated in the eLearning environment scored higher on their exams and had higher self-efficacy scores.

Simulation. Learning strategies have been identified that may increase students' self-efficacy. Leyshon (2002) identified strategies that have been utilized to increase students' self-efficacy. Leyshon stated that positive reinforcement and encouragement, along with constructive persuasion, have been utilized to increase students' self-efficacy. High-fidelity simulation incorporates the concepts of positive reinforcement, encouragement, and constructive persuasion in the form of coaching during the

simulation and debriefing following the simulation, and in turn may act to increase students' self-efficacy.

Simulators range from low-fidelity to high-fidelity. Research has been conducted regarding the use of various human patient simulators and simulation models and student preferences. Seropian et al. (2004) examined different types of simulation equipment and stated that students prefer high-fidelity simulation because of its realistic qualities. Students also stated that participating in high-fidelity simulation experiences decreased their anxiety related to clinical experience and increased their confidence. Research has also identified that even though students prefer high-fidelity simulation, other forms of simulation may be just as effective, depending on the subject matter. Jeffries, Woolf, and Linde (2003) conducted an experimental study comparing two teaching methods that were used to teach students how to perform a 12-lead electrocardiogram (ECG). The first method utilized a self-study module, lecture demonstration, and mannequin practice with a low-fidelity mannequin and 12-lead ECG machine. The second method utilized an interactive multimedia CD-ROM, a virtual reality program, and a self-study module. The findings revealed no significant difference in the perceived self-efficacy of the students. The study demonstrated that when a single skill is being taught, the most cost-effective method should be employed.

Studies were analyzed that examined the impact of simulation on medical students' self-efficacy. Marshall et al. (2001), in their study involving medical residents and interns in the development of trauma management skills, found that of these two groups of medical students, only the interns self-reported that the high-fidelity simulation experience increased their self-confidence. Meier, Henry, Marine, and Murray (2005)

evaluated a medical school curriculum that was partially simulation-based and found that the surgical residents had higher self-efficacy at the end of the curriculum. Maibach, Schieber, and Carroll (1996) examined the role of self-efficacy in pediatric resuscitation. In this study, no statistics were presented. Maibach et al. made suggestions about how self-efficacy regarding pediatric resuscitation could be increased. The suggestions included the use of simulation. The strategies presented were based on Bandura's (1986) theory of self-efficacy.

Jeffries and Rizzolo (2006) conducted a study comparing the learning strategy of case study to high-fidelity simulation. The scenario utilized in this study was caring for a post-operative patient. Both groups of students received a lecture regarding the care of post-operative patients followed by either a case study learning experience or a high-fidelity simulation learning experience. No significant differences were found in knowledge acquisition or self-perceived performance. The high-fidelity simulation group reported greater satisfaction with the learning experience and a higher level of self-confidence.

Bearnson and Wiker (2005) examined the use of high-fidelity simulation to replace one day of clinical experience. Students were presented with various patient scenarios involving administration of pain medication. The students reported that their confidence level increased following the simulation experience. This type of supplemental instruction would allow students to experience patient care in a controlled environment prior to caring for actual patients requiring pain medication.

The facilitator plays an important role in the simulation learning experience. One study examined the role of the facilitator during simulation in the development of self-

efficacy. Treloar, Hawayek, Montgomery, and Russell (2001) examined the use of high-fidelity simulation to train teams of emergency medical personnel. In this study some groups had a facilitator physically present during the simulation experience while other groups conducted their experiences off-site and only had a facilitator present via videoconferencing. The authors reported that the group that had the facilitator present during and after the simulation had higher self-efficacy scores. This study emphasized the importance of coaching and debriefing by the facilitator.

The impact of simulation and self-efficacy on the development of clinical judgment skills has also been studied. White (2003) conducted a qualitative study that identified themes related to the development of effective clinical decision making skills. One of the themes identified was confidence in the ability to perform necessary skills. Students stated that if they felt confident in their ability to perform necessary skills then they would be able to concentrate more on the actual needs of the patient.

In the clinical setting it is paramount that students be able to focus directly on the patient, correctly assessing and providing care for the patient. Bandura's (1989) theory of self-efficacy addresses the need of the nurse to be able to put aside stress and concentrate on caring for the patient. Bandura stated that individuals' self-efficacy will impact the amount of stress they experience when faced with a complex situation. The clinical setting often places students in complex situations that include a high level of stress that directly relates to the setting. Students with a high level of self-efficacy may be able to reduce the impact that the stress of a complex situation has on their ability to provide quality patient care.

As students learn how to care for a variety of patients and begin developing clinical judgment skills, learning strategies should be utilized that decrease environment stress so that learning may be maximized. High-fidelity simulation places students in a safe learning environment where the stressors that are present in the actual clinical setting are diminished, thus possibly allowing the students to increase their clinical self-efficacy. Increasing students' clinical self-efficacy may allow them to care for their patients effectively in the clinical setting.

Conclusion

The review of the literature regarding the impact of simulation as a learning strategy on clinical self-efficacy has identified several themes. Simulation has been described as being theoretically based on experiential learning theory, the theory of reflection and constructivist learning theory. Simulation has been described as a learning strategy that has the ability to generate a realistic clinical scenario where students may engage in significant learning experiences. Simulation has been studied for its ability to be utilized for a variety of educational purposes to include assessment, practicing skills, remediation and evaluation. Simulation has also been described as a learning strategy that may have the ability to increase students' self-efficacy.

Several researchers have identified the need for a solid base of knowledge regarding the use of simulation in nursing education (Bremner et al., 2006). McGaghie et al. (2006) identified the need for additional research regarding the use of high-fidelity simulation in health-care professional education. Bearnson and Wiker (2005) stated that additional research, examining the most effective ways to utilize simulation and the most

effective times for introducing simulation, was needed. Lasater (2007) agreed with other researchers that many schools of nursing are beginning to incorporate simulation into their curriculum and that there is a need to build upon the knowledge base regarding how to utilize simulation effectively.

CHAPTER 3. METHODOLOGY

Introduction

The purpose of this study was to evaluate the impact of simulation on the development of clinical self-efficacy in junior- and senior-level nursing students at a Midwestern liberal arts university. This study also evaluated students' satisfaction with simulation as an educational strategy. Finally, this study also evaluated the impact that the learner's role in the simulation has on clinical self-efficacy and learner satisfaction.

To evaluate the use of simulation the following three research questions were addressed in this study:

1. Given the use of simulation in learning laboratory settings, what is the impact of high-fidelity simulation on clinical self-efficacy in junior- and senior-level nursing students?

2. Given the use of simulation in learning laboratory settings, what is the impact of high-fidelity simulation on learner satisfaction in junior-and senior-level nursing students?

3. Utilizing high-fidelity simulation, what is the impact of the role the learners play in the simulation on clinical self-efficacy and learner satisfaction on junior-and senior-level nursing students?

This study utilized quantitative research methods. In examining the impact of simulation on learner self-efficacy and learner satisfaction, the researcher utilized an evaluation design methodology. The methodology to be used in the evaluation of simulation will be addressed in the following sections: research design, sample and

population, instrumentation, data collection procedures, data analysis procedures, ethical issues and limitations.

Research Design

An evaluation design methodology was utilized in this study. Evaluation research examines the effectiveness of a program or practice and seeks ways to improve the program or practice (Polit & Beck, 2008; Brink & Wood, 1998). The process of evaluation research may seem threatening as individuals may have strong ties to particular programs or practices (Polit & Beck). Nursing educators may feel tied to certain educational practices but they are many times seeking alternative strategies that will meet their students' educational needs. This study examined the use of simulation in nursing education and the impact simulation has on clinical self-efficacy and learner satisfaction.

The format the evaluation design methodology uses depends on the research questions. Evaluation research seeks to evaluate the effectiveness of a program or intervention and also seek ways to improve the program or intervention. Therefore, an evaluation design methodology may be quantitative, qualitative or a combination of both (Robson, 2002). The format the evaluation design methodology uses depends on the research questions. In this study the evaluation design methodology was quantitative in nature as the study sought to evaluate the use of simulation in nursing education at a Midwestern liberal arts university. Using simulation within teaching strategies is still evolving, so it is important to examine how to utilize simulation effectively.

There are advantages and disadvantages to utilizing evaluation research. Evaluation research, when used appropriately, may assist decision-makers as they seek to determine the value of a program or intervention (Patton, 2002). Formative evaluation studies act to improve programs, as adjustments in the program can be made prior to the summative evaluation. One of the disadvantages of evaluation research revolves around the generalizability of the findings. Findings from evaluation research are very limited in the ability to generalize the findings to other populations. Evaluation research is based on a particular program or practice in an identified setting, making it difficult to generalize beyond the evaluation setting (Patton). Also, evaluation studies may be viewed as punitive to the program when the evaluation findings are not favorable.

Evaluation research ranges from large program evaluations to evaluations involving a single part of a program. This study sought to evaluate a single teaching strategy, its use and how it could be effectively utilized in the nursing curriculum. The purpose of the research design utilized for this study was to evaluate the impact that the teaching strategy of simulation had on clinical self-efficacy and learner satisfaction in junior and senior level nursing students.

Sample and Population

Setting

The study took place at a Midwestern liberal arts university. One of the degrees that may be earned at this university is a Bachelor of Science in Nursing. The nursing curriculum is composed of nursing courses, supporting courses and university general education courses. Nursing majors complete the university general education

requirements and the supporting course requirements during the first two years of their educational experience. Upon completion of the supporting and general education courses, nursing majors are admitted to the nursing courses. The nursing courses are divided into four levels that are spread over a two-year period. The junior level is composed of levels one and two. The senior level is composed of levels three and four. All four levels will be included in the study.

Target Population

The target population consisted of junior and senior nursing students who were in levels one, two, three, and four. The nonprobability sampling method of convenience sampling was utilized to obtain the participants for this study. Nursing students in levels one, two, three and four were solicited for their willingness to participate in the study. The nursing students who agreed to participate at each level were divided into two groups. One group of students participated in the simulation experience. The control group did not participate in the simulation experience.

Instrumentation

Each of the instruments utilized in this study were unmodified versions of instruments in standard usage within the discipline of nursing and nursing education. Each instrument consisted of a Likert-scale survey that was designed to measure the participants' attitudes (Gall, Gall, & Borg, 2007). Each of the instruments had been utilized in other studies and each instrument possessed established validity and reliability. The following paragraphs will describe the instruments and how they were utilized, and also address the reliability and validity of each instrument.

Only the students in the experimental group engaged in simulation learning experiences. Prior to the simulation experience, however, clinical self-efficacy was measured on both the experimental groups and the control groups at each level. The *Clinical Skills Self-Efficacy Measure* (Owen, 2002) was utilized to measure each student's current clinical skills self-efficacy. Following the simulation experience, learner satisfaction and self-efficacy was measured. Learner satisfaction with the simulation experience was measured on the experimental group following the simulation experience. Self-efficacy was measured on both the control group and the experimental group. *The Student Satisfaction and Self-Confidence in Learning Scale* (National League for Nursing [NLN], 2007a) was utilized to measure both learner satisfaction and learner self-confidence. *The Simulation Design Scale* (NLN, 2007b) and *The Educational Practices Questionnaire* (NLN, 2007c) were utilized to examine the quality of the simulation. The *Clinical Skills Self-Efficacy Measure* was also utilized to examine present and future perceived self-efficacy. Demographic data was also collected at the same time the survey is administered.

The *Clinical Skills Self-Efficacy Measure* was utilized to evaluate clinical self-efficacy. The *Clinical Skills Self-Efficacy Measure* examines students' perceptions of their abilities to perform identified skills as they care for patients now and following graduation. This instrument was evaluated by content experts to establish its validity (Owen, 2002). According to Owen, the Cronbach alpha of the scale to measure the students' present perception was 0.97. The Cronbach alpha of the scale to measure the students' future perception was 0.98.

Student Satisfaction and Self-Confidence in Learning Scale is a Likert-scale survey instrument that measures learners' satisfaction and self-confidence that is designed to be administered following simulation experiences. Learner satisfaction is addressed through the areas of teaching methods, materials and activities. Self-confidence is addressed through the areas of the students' ability to master the content and apply the content to the clinical setting. This survey also examines the students' feelings regarding active learning.

According to the NLN (2007d), the reliability of this instrument was analyzed utilizing Cronbach's alpha. The Cronbach alpha for learner satisfaction was 0.94. The Conbach alpha for self-confidence was 0.87.

The Simulation Design Scale is a Likert-scale survey that is used to evaluate the students' satisfaction with the design of the simulation. The major design features that are evaluated by this survey are the objectives, student support, problem solving skills, debriefing period and fidelity. The survey evaluates both the design features and the importance of the identified features to the students.

According to the NLN (2007d), the content validity for the survey was verified by utilizing content experts. The NLN also established the reliability of this survey using Cronbach's alpha. The Cronbach alpha was 0.92 for the design features and 0.96 for the importance of the features to the students.

The Educational Practices Questionnaire is also a Likert-scale instrument that measures learner satisfaction with the educational practices presented in the simulation. The educational practices that will be measured with this survey are active learning,

collaboration, diverse ways of learning, and high expectations. This survey also measures the importance of the educational practices to the students.

According to the NLN (2007d), the content validity of the survey was established by utilizing educational practices identified by Chickering and Gamson (1987). The NLN also established the reliability of this survey utilizing Cronbach's alpha. The Cronbach's alpha was 0.86 for the satisfaction with the use of the identified educational practices and 0.87 for the importance of the educational practices to the students.

Prior to the administration of the instruments, the researcher explained the purpose of the research and the participant's role in the study. The instruments were administered to the students at the appropriate times. The *Clinical Skills Self-Efficacy Measure* was administered before and after the simulation. The *Simulation Design Scale, Educational Practices Questionnaire,* and *Student Satisfaction and Self-Confidence in Learning Scale* were administered following the simulation experience.

Data Collection

Approval Process

Prior to data collection, Institutional Review Board approval was obtained from Capella University and the university where the research was conducted. Prior to participating in the study, each participant was provided information regarding the study and the participant's role in the study. The participants were then asked to sign an informed consent document. Participants who gave their informed consent were included in the study.

Collection Procedure

Data was collected from junior- and senior-level nursing students in a baccalaureate nursing program. Prior to the collection of data, the nursing faculty received information regarding the study and their permission was obtained in order to collect data from the students in their classes. Faculty members who were willing to assist in data collection were trained in the administration of the instruments. Data collection took place prior to the simulation experience and following the simulation experience. Simulations were conducted at levels one, two, three and four. The simulations were designed to augment the instructional content the students were covering in the didactic portion of their classes. The data was collected by both the faculty facilitating the simulations and the researcher. Prior to the simulation experience, participants completed the *Clinical Skills Self-Efficacy Measure* and a demographic data form. The students in the experimental groups then participated in the simulation experience. Following the simulation experience, including the debriefing period, the *Clinical Skills Self-Efficacy Measure, Student Satisfaction and Self-Confidence in Learning Scale, Simulation Design Scale,* and *Educational Practices Questionnaire* instruments were completed by the participants in the experimental group. The control group completed the *Clinical Skills Self-Efficacy Measure* again, as well. The data obtained from these instruments was collated and analyzed to evaluate the impact of simulation on clinical self-efficacy and learner satisfaction.

Data Analysis

Data collected in this study was analyzed utilizing the *Statistical Package for the Social Sciences.* Descriptive statistics were utilized to analyze the demographic data in order to present an accurate picture of the study sample. Each survey instrument was analyzed utilizing descriptive statistics to determine frequency distributions, measures of central tendency and measures of dispersion. To evaluate simulation and its impact on clinical self-efficacy and learner satisfaction further, statistics that examine causality were utilized. Inferences that were drawn from the data analysis only apply to the original sample, as this evaluation study utilized convenience sampling, obtaining a random sample from a non-random convenience sample.

The first research question, which examined the impact of high-fidelity simulation on clinical self-efficacy in junior- and senior-level nursing students, was answered utilizing data gathered from the *Clinical Skills Self-Efficacy Measure* and the self-confidence portion of the *Student Satisfaction and Self-Confidence in Learning Scale* instruments. Participant scores of both the control groups and the experimental groups from the *Clinical Skills Self-Efficacy Measure* prior to the simulation were compared with participant scores following the simulation. The scores of the experimental groups on the self-confidence portion of *The Student Satisfaction and Self-Confidence in Learning Scale* were analyzed to determine if the participants felt confident in their ability to transfer the skills to the actual clinical setting following the simulation experience.

The second research question, which examined the learners' satisfaction with the simulation experience, was answered utilizing data gathered from the *Student Satisfaction and Self-Confidence in Learning Scale,* the *Simulation Design Scale,* and *The*

Educational Practices Questionnaire. Following the simulation experience, the students in the experimental group completed the questionnaires. The total scores on the individual instruments were calculated. Also, individual sections' summated scores on the surveys were analyzed in order to evaluate the degree of satisfaction the participants had with the simulation learning experience. To analyze the data, descriptive statistics were utilized along with inferential statistics.

The third research question, which examined the impact of the role that the learners play in the simulation on clinical self-efficacy and learner satisfaction on junior- and senior-level nursing students, was answered by comparing the role that the participants played in the simulation with their scores on the various survey instruments. To determine if the role that the learners played in the simulation impacted clinical self-efficacy, the role that the participants played was compared with the difference in pre- and post-simulation scores on the *Clinical Skills Self-Efficacy Measure*. To determine if the role that the learners played impacted learner satisfaction, the role that the participants played in the study was compared with the participants' scores on the *Student Satisfaction and Self-Confidence in Learning,* the *Simulation Design Scale,* and *The Educational Practices Questionnaire.*

Ethical Issues

Institutional Review Board guidelines concerning the treatment of human subjects were followed. Participants were provided with information regarding the purpose of the study and their role in the study. Each participant was asked to sign an informed consent

form prior to participating. All data collection instruments were coded with an identification number in order to maintain the anonymity of the participants.

Limitations

There were several limitations in this study. The sample being utilized was a convenience sample. The size of the sample was small, making the information obtained limited in its usability (Gall, Gall, & Borg, 2007). Also, because this was an evaluation study where one university was utilized to collect data, the generalizability of the findings is limited.

Conclusion

The purpose of this study was to evaluate the impact that the teaching strategy of simulation has on clinical self-efficacy and learner satisfaction in junior- and senior-level nursing students. The study utilized quantitative research methods. In examining the impact of simulation on learner self-efficacy and learner satisfaction, an evaluation design methodology was utilized. The target population consisted of junior- and senior-level nursing students at a Midwestern university. The instruments that were utilized provided the researcher with information regarding the effectiveness of simulation in the nursing curriculum. The findings of this study were utilized to assist in improving the nursing curriculum as it seeks to prepare students to face the complexities of the current health care environment.

CHAPTER 4. DATA COLLECTION AND ANALYSIS

Introduction

The purpose of this study was to evaluate the impact of simulation on the development of clinical self-efficacy in junior- and senior-level nursing students at a Midwestern liberal arts university. This study also evaluated students' satisfaction with simulation as an educational strategy. Finally, this study evaluated the impact that the learner's role in the simulation had on clinical self-efficacy and learner satisfaction. This chapter will cover the results of this study. Topics presented will relate to the demographics of the participants and to the three research questions.

Characteristics of the Sample

The participants in this study were junior- and senior- level nursing students in a baccalaureate nursing program. There were 103 participants. There were 49 in the control group and 54 in the experimental group. All participants completed a demographic survey. The information examined in the demographic survey included, age, grade point average, marital status, gender, ethnic group, employment status and number of hours working per week, prior experience in health care and prior experience with simulation.

The average age of the participants was 22 and the average grade point average (GPA), on a 4-point scale was 3.18. The participants in this study were primarily single

(88.3%), female (92.2%) and Caucasian (87.4%). The demographic data also revealed that 42% of the participants were not employed while attending school and 58% of the participants were employed in addition to attending school. The number of hours employed per week ranged from 1 to 10 hours per week (57.9%) to over 30 hours per week (1.8%). The demographic variables further revealed that 53.4% of the participants had no previous health care-related work experience and that 59.2% of the participants did not have any previous learning experiences in simulation.

The participants were divided into control groups and experimental groups at each level. The control groups would receive traditional instruction. The experimental groups would engage in a simulation experience in addition to the traditional classroom experience. A comparison was made of the demographic data obtained from both groups and is presented in Tables 1-8.

Table 1. Age and GPA

Group		N	Minimum	Maximum	Mean
Control	Age	49.00	19.00	34.00	22.04
	GPA	49.00	2.47	3.83	3.22
	Total	49.00			
Experimental	Age	54.00	19.00	34.00	21.56
	GPA	54.00	2.56	3.99	3.14
	Total	54.00			

Table 2. Marital Status

Group		Frequency	Percent
Control	Single	41.0	83.7
	Married	8.0	16.3
	Total	49.0	100.0
Experimental	Single	53.0	98.1
	Married	1.0	1.9
	Total	54.0	100.0

Table 3. Gender

Group	Gender	N	Percent
Control	Male	5.0	10.2
	Female	44.0	89.8
	Total	49.0	100.0
Experimental	Male	3.0	5.6
	Female	51.0	94.4
	Total	54.0	100.0

Table 4. Ethnicity

Group		Frequency	Percent
Control	African American	3.0	6.1
	Caucasian	42.0	85.7
	Hispanic	3.0	6.1
	Asian	1.0	2.0
	Total	49.0	100.0
Experimental	African American	1.0	1.9
	Caucasian	48.0	88.9
	Hispanic	2.0	3.7
	Asian	2.0	3.7
	Other	1.0	1.9
	Total	54.0	100.0

Table 5. Employment Status

Group		Frequency	Percent
Control	Yes	31.0	63.3
	No	18.0	36.7
	Total	49.0	100.0
Experimental	Yes	29.0	53.7
	No	25.0	46.3
	Total	54.0	100.0

Table 6. Number of Hours Employed per Week

Group			Frequency	Percent
Control		1-10	16.0	32.7
		11-20	9.0	18.4
		21-30	5.0	10.2
		Total	30.0	61.2
		Not employed	19.0	38.8
	Total		49.0	100.0
Experimental		1-10	17.0	31.5
		11-20	6.0	11.1
		21-30	3.0	5.6
		> 30	1.0	1.9
		Total	27.0	50.0
		Not employed	27.0	50.0
	Total		54.0	100.0

Table 7. Previous Experience in Health Care

Group		Frequency	Percent
Control	Yes	20.0	40.8
	No	29.0	59.2
	Total	49.0	100.0
Experimental	Yes	28.0	51.9
	No	26.0	48.1
	Total	54.0	100.0

Table 8. Previous Simulation Experience

Group		Frequency	Percent
Control	Yes	19.0	38.8
	No	30.0	61.2
	Total	49.0	100.0
Experimental	Yes	23.0	42.6
	No	31.0	57.4
	Total	54.0	100.0

A chi-square test was computed to compare the categorical demographic variables of the control group and the experimental group. The test showed no significant differences on the all the variables except marital status. The test showed a significant difference between the groups on the number of married students (control: *n* = 8, 16.3%; experimental: *n* = 1, 1.9 %) and single students (control: n = 41, 83.7%; experimental: n = 53, 98.1 %), X2 (1) = 6.8 (Table 9). An analysis of variance (ANOVA) was computed to compare the interval variables of the control group and the experimental group. No significant differences were found for the variables of age and grade point average.

Table 9. Chi-Square

Variable	X^2	F	p
Age		.84	.36
GPA		1.08	.30
Marital Status	6.80		.009
Ethnicity	2.70		.61
Gender	.78		.38
Employment	.97		.32
Hours Employed	1.97		.57
Health Experience	1.3		.26
Sim Experience	.16		.70

Research Questions

The following three research questions were explored in this study to evaluate the use of simulation in nursing education:

1. Given the use of simulation in learning laboratory settings, what is the impact of high-fidelity simulation on clinical self-efficacy in junior- and senior-level nursing students?

2. Given the use of simulation in learning laboratory settings, what is the impact of high-fidelity simulation on learner satisfaction in junior-and senior-level nursing students?

3. Utilizing high-fidelity simulation, what is the impact of the role the learners, play in the simulation on clinical self-efficacy and learner satisfaction on junior-and senior-level nursing students?

Research Question 1

The first research question addressed the impact of high-fidelity simulation on clinical self-efficacy. Scores on the *Clinical Skills Self-Efficacy Measure* were obtained from the experimental group and the control group at the beginning of the semester.

Repeat scores on the *Clinical Skills Self-Efficacy Measure* were then obtained from the experimental group following the simulation. Repeat scores on the *Clinical Skills Self-Efficacy Measure* were obtained from the control group at the same time the experimental group engaged in the simulation. In examining the self-efficacy scores of the two groups, means and standard deviations were obtained and are displayed in Table 10. Both the control group and the experimental groups increased their scores on the *Clinical Skills Self-Efficacy Measure* from the pre-test to the post-test. The highest score that could be obtained on the *Clinical Skills Self-Efficacy Measure* was 240 points. The control group increased their score by 20.29 points and the experimental group increased their score by 24 points. The experimental group's increase was slightly higher than the control group, but the difference was not statistically significant.

Table 10. Clinical Skills Self-Efficacy Measure Descriptive Statistics

Group		N	Minimum	Maximum	Mean	SD
Control	CSE Pre-Test	49.00	74.00	176.00	127.10	27.84
	CSE Post-Test	49.00	95.00	215.00	147.39	27.68
Experimental	CSE Pre-Test	54.00	58.00	173.00	132.35	25.40
	CSE Post-Test	54.00	108.00	212.00	156.35	24.06

To assess the change in score on the *Clinical Skills Self-Efficacy Measure* for pre-test to post-test for the experimental group and the control group, a paired t-test was used. The results in Table 11 show that there was a significant difference between the pre- and post-test scores for both the control and the experimental group: control group, t (48) = 4.72, $p < .001$; and experimental group t (53) = 6.4, $p < .001$.

Table 11. Paired-Samples t Test on Clinical Skills Self-Efficacy Measure Scores

GROUP			N	Correlation	Sig.
Control	Pair 1	CSE Pre-Test & CSE Post-Test	49.00	.46	.001
Experimental	Pair 1	CSE Pre-Test & CSE Post-Test	54.00	.41	.002

To assess the impact of high-fidelity simulation on *Clinical Skills Self-Efficacy Measure scores,* a 2 x 2, mixed-model ANOVA was performed comparing the self-efficacy scores of both the control group and the experimental group. The results, presented in Table 12, revealed that the main effect of the high-fidelity simulation was not statistically significant F (1, 101) = 2.63, $p > .05$. Although the experimental group (M = 144.35) outscored the control group (M = 137.24), the difference was not statistically significant.

Table 12. Mixed Model ANOVA Between-Subjects Effect

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	4074158.18	1.00	4074158.18	4123.28	.000	.976
Group	2595.07	1.00	2595.07	2.63	.108	.025
Error	99796.75	101.00	988.09			

A significant main effect of time was obtained, F (1, 101) = 65.17, $p <.01$. The scores on the *Clinical Skills Self-Efficacy Measure* following the simulation (M = 151.87) were significantly higher than at the beginning of the semester (M = 129.72). These results are depicted in Table 13.

Table 13. ANOVA Within Subjects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time	25191.26	1.00	25191.26	65.17	.000	.392
time group	177.20	1.00	177.20	.46	.500	.005
Error(time)	39044.00	101.00	386.57			

Research Question 2

The second research question addressed the satisfaction levels of junior- and senior-level nursing students following a learning experience with high-fidelity simulation. Three different tools were utilized to examine the leaner satisfaction. The tools utilized were *Simulation Design Scale, Educational Practices Questionnaire* and *Student Satisfaction and Self-Confidence in Learning Scale.* Descriptive statistics were obtained on the tools that addressed learner satisfaction. A summary of the descriptive statistics may be found for each questionnaire in Tables 14, 15 and 16.

Table 14. Descriptive Statistics for Simulation Design Scale

	N	Minimum	Maximum	Mean	SD
Objectives	54.00	12.00	25.00	21.81	2.87
Support	54.00	13.00	20.00	17.48	2.21
Problem Solving	54.00	16.00	25.00	22.74	2.24
Feedback	54.00	14.00	20.00	18.91	1.63
Fidelity	54.00	7.00	10.00	9.56	.84

Table 15. Descriptive Statistics for Educational Practices Questionnaire

	N	Minimum	Maximum	Mean	SD
Active Learning	54.00	37.00	50.00	44.74	3.79
Collaboration	54.00	5.00	10.00	8.65	1.43
Diverse Ways	54.00	5.00	10.00	9.13	1.20
High Expectations	54.00	6.00	10.00	8.61	1.29

Table 16. Descriptive Statistics for Student Satisfaction and Self-Confidence in Learning

	N	Minimum	Maximum	Mean	SD
Satisfaction	54.00	17.00	25.00	22.93	2.378
Confidence	54.00	29.00	40.00	33.96	2.66

Learner satisfaction was then compared by the level in the nursing curriculum of the nursing student. A multivariate analysis of variance (MANOVA) was conducted in order to compare the learner satisfaction scores of the four levels of nursing students. MANOVA results revealed no significant differences among the four levels of nursing students on the *Simulation Design Scale,* (Table 17) or the *Educational Practices Questionnaire* (Table 18). MANOVA results, presented in Table 19, revealed a significant difference among the four levels of nursing students based upon the *Student Satisfaction and Self-Confidence in Learning Scale.* A significant difference was found for Learner Satisfaction, F (3, 50) = 5.78, $p < .05$. The Bonferroni post hoc analysis, presented in Table 20, revealed that level two students (M = 24.13, SD = 1.12) were significantly more satisfied with the simulation than were level four students (M = 20.90, SD = 2.33).

Table 17. Comparison Between Level and Simulation Design Scale Scores

Dependent Variable	df	F	Sig.	Partial Eta Squared
Objectives	3.00	.48	.700	.028
Support	3.00	1.05	.379	.059
Problem Solving	3.00	1.51	.225	.083
Feedback	3.00	.19	.903	.011
Fidelity	3.00	.44	.724	.026

Table 18. Comparison Between Level and Educational Practices Questionnaire

Dependent Variable	df	Mean Square	F	Sig.
Active Learning	3.00	25.43	.86	.149
Collaboration	3.00	2.29	11.13	.347
Diverse Ways	3.00	1.47	1.03	.389
High Expectations	3.00	.76	.44	.728

Table 19. Comparison Between Level and Student Satisfaction and Self-Confidence in Learning Scores

Dependent Variable	df	Mean Square	F	Sig.	Partial Eta Squared
Satisfaction	3.00	25.73	5.78	.002	.258
Confidence	3.00	13.26	1.97	.130	.106

Table 20. Comparison of Learner Satisfaction by Level

Level		Mean Difference	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
1	2	-1.22	.76	.681	-3.2995	.8601
	3	.62	.90	1.000	-1.8648	3.0982
	4	2.02	.90	.180	-.4648	4.4982
2	1	1.22	.76	.681	-.8601	3.2995
	3	1.84	.80	.160	-.3740	4.0467
	4	3.24	.80	.001	1.0260	5.4467
3	1	-.62	.90	1.000	-3.0982	1.8648
	2	-1.84	.80	.160	-4.0467	.3740
	4	1.40	.94	.865	-1.1918	3.9918
4	1	-2.02	.90	.180	-4.4982	.4648
	2	-3.24	.80	.001	-5.4467	-1.0260
	3	-1.40	.94	.865	-3.9918	1.1918

Research Question 3

The third research question addressed the impact of the role that the student played in the simulation on clinical self-efficacy and learner satisfaction. The experimental group engaged in the simulation learning experience assumed the roles of primary nurse, secondary nurse, visitor and observer. Descriptive statistics were performed that examined the scores on the *Clinical Skills Self-Efficacy Measure* according to the role the student played in the simulation. These statistics are presented in Table 21. Descriptive statistics were also performed that examined the scores on the self-confidence portion of the *Student Satisfaction and Self-Confidence in Learning Scale* by role played in the simulation. These are presented in Table 22.

Table 21. Descriptive Statistics for Clinical Skills Self-Efficacy Measure by Role

Role	Mean	N	SD	Minimum	Maximum
Primary Nurse	151.90	10	24.87	108.00	190.00
Secondary Nurse	151.53	15	19.86	111.00	190.00
Observer	159.46	24	25.48	122.00	212.00
Visitor	172.75	4	27.48	133.00	193.00
Total	156.79	53	24.07	108.00	212.00

Table 22. Descriptive Statistics for Student Satisfaction and Self-Confidence in Learning by Role

Role	Mean	N	SD	Minimum	Maximum
Primary Nurse	34.60	10	2.80	31.00	38.00
Secondary Nurse	33.87	15	2.61	30.00	38.00
Observer	33.88	24	2.44	29.00	40.00
Visitor	34.25	4	4.19	30.00	40.00
Total	34.04	53	2.63	29.00	40.00

To examine the impact of the individual roles (primary nurse, secondary nurse, observer and visitor) on clinical self-efficacy, the scores on the *Clinical Skills Self-Efficacy Measure* were compared to the role the student played in the simulation. A MANOVA was conducted to determine role differences in *Clinical Skills Self-Efficacy Measure* scores and self-confidence scores from the *Student Satisfaction and Self-Confidence in Learning Scale*. MANOVA results revealed no significant differences among the four roles on the *Clinical Skills Self-Efficacy Measure*, F (3, 49) = 1.06, p = .37 and the self-confidence scores from the *Student Satisfaction and Self-Confidence in Learning Scale, F* (3, 49) = .203, p = .89. (Table 23)

Table 23. Comparison Between Role and Clinical Skills Self-Efficacy Measure and Self-Confidence in Learning

Dependent Variable	df	Mean Square	F	Sig.	Partial Eta Squared
CSE Post-Test	3.00	614.46	1.06	.373	.061
Confidence	3.00	1.47	.20	.894	.012

The second part of the third question addressed the impact the role the learner played on satisfaction with the simulation. Descriptive statistics were performed on the learner satisfaction scores based on the role the student played during the simulation. Descriptive statistics for the *Simulation Design Scale,* the *Educational Practices Questionnaire,* and the *Student Satisfaction and Self-Confidence in Learning Scale* are found in Tables 24, 25, and 26.

Table 24. Descriptive Statistics for Simulation Design Scale by Role

ROLE		Objectives	Support	Problem Solving	Feedback	Fidelity
Primary Nurse	Mean	20.90	17.90	22.50	19.00	9.60
	N	10.00	10.00	10	10.00	10.00
	SD	4.48	2.33	2.59	1.63	.70
	Minimum	12.00	14.00	19.00	16.00	8.00
	Maximum	25.00	20.00	25.00	20.00	10.00
Secondary Nurse	Mean	21.53	17.13	22.60	19.27	9.53
	N	15.00	15.00	15.00	15.00	15.00
	SD	2.45	2.56	1.99	1.16	.915
	Minimum	18.00	13.00	19.00	17.00	7.00
	Maximum	25.00	20.00	25.00	20.00	10.00
Observer	Mean	22.33	17.33	22.96	18.70	9.54
	N	24.00	24.00	24.00	24.00	24.00
	SD	2.079	1.90	1.99	1.85	.88
	Minimum	18.00	14.00	20.00	14.00	7.00
	Maximum	25.00	20.00	25.00	20.00	10.00
Visitor	Mean	22.75	19.50	22.50	19.25	9.50
	N	4.00	4.00	4.00	4.00	4.00
	SD	3.86	1.00	4.36	1.50	1.00
	Minimum	17.00	18.00	16.00	17.00	8.00
	Maximum	25.00	20.00	25.00	20.00	10.00

Table 25. Descriptive Statistics for Educational Practices Questionnaire by Role

Role		Active Learning	Collaboration	Diverse Ways	High Expectations
Primary Nurse	Mean	46.40	9.00	9.40	8.80
	N	10.00	10.00	10.00	10.00
	SD	4.43	1.33	.97	1.48
	Minimum	38.00	6.00	8.00	6.00
	Maximum	50.00	10.00	10.00	10.00
Secondary Nurse	Mean	43.47	9.27	9.00	8.60
	N	15.00	15.00	15.00	15.00
	SD	3.71	1.16	1.07	1.24
	Minimum	37.00	6.00	7.00	6.00
	Maximum	50.00	10.00	10.00	10.00
Observer	Mean	44.50	8.17	9.17	8.54
	N	24.00	24.00	24.00	24.00
	SD	3.40	1.37	1.27	1.18
	Minimum	37.00	6.00	5.00	6.00
	Maximum	50.00	10.00	10.00	10.00
Visitor	Mean	46.50	8.50	8.50	9.25
	N	4.00	4.00	4.00	4.00
	SD	4.36	2.38	1.91	1.50
	Minimum	40.00	5.00	6.00	7.00
	Maximum	49.00	10.00	10.00	10.00

Table 26. Descriptive Statistics for Student Satisfaction and Self-Confidence in Learning by Role

Role	Mean	N	SD	Minimum	Maximum
Primary Nurse	23.20	10	2.489	19.00	25.00
Secondary Nurse	23.13	15	2.39	19.00	25.00
Observer	23.08	24	2.08	18.00	25.00
Visitor	22.00	4	2.83	18.00	24.00
Total	23.04	53	2.25	18.00	25.00

To examine the impact of the individual roles on learner satisfaction the scores on the *Simulation Design Scale,* the *Educational Practices Questionnaire* and the *Student Satisfaction and Self-Confidence in Learning Scale* were compared to the role the student played in the simulation. A MANOVA was conducted to determine the impact of role differences in *Simulation Design Scale* scores, *Educational Practices Questionnaire* scores and *Student Satisfaction and Self-Confidence in Learning Scale s*cores. MANOVA results, displayed in Table 27, revealed no significant differences among the four roles on the *Simulation Design Scale,* the *Educational Practices Questionnaire* and the *Student Satisfaction and Self-Confidence in Learning Scale.*

Table 27. Comparison Between Role and Components of Learner Satisfaction Tools

Dependent Variable	df	Mean Square	F	Sig.	Partial Eta Squared
Active Learning	3	21.87	1.55	.214	.086
Collaboration	3	4.21	2.16	.104	.117
Diverse Ways	3	.86	.58	.630	.034
High Expectations	3	.66	.40	.750	.024
Satisfaction	3	1.59	.30	.825	.018
Objectives	3	6.45	.77	.514	.045
Support	3	6.72	1.45	.239	.082
Problem Solving	3	.75	.14	.936	.008
Feedback	3	1.09	.42	.742	.025
Fidelity	3	.01	.02	.997	.001

Conclusion

This chapter has presented the findings from a quantitative evaluation study that was designed to evaluate the use of simulation in nursing education. There were 103 participants in the study. The participants were junior- and senior-level nursing students. Three research questions were presented that examined the use of simulation in nursing education and the impact of simulation on clinical self-efficacy and learner satisfaction.

The first research question examined the impact of simulation on clinical self-efficacy. There was a significant difference in the scores on the *Clinical Skills Self-Efficacy Measure* from pre-test to post-test for both the experimental and the control group. When the two groups were compared, the experimental group scored higher on the *Clinical Skills Self-Efficacy Measure,* but the difference was not statistically significant.

The second research question examined how satisfied the learners were with the simulation learning experience. Overall, the learners rated the learning experience as positive. When the level of satisfaction was examined by level, it was found that level two was significantly more satisfied with the experience than level four.

The third research question examined what impact the role that the learner played during the simulation had on clinical self-efficacy and learner satisfaction. The analysis of the data revealed that there was no significant difference in clinical self-efficacy or learner satisfaction based on the role that the learner played during the simulation. Chapter 5 will present a discussion of the results and recommendations.

CHAPTER 5. RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Simulation is an educational strategy that is based on experiential learning theory, the theory of reflection and constructivist learning theory. In nursing education, simulation is an educational strategy that has the potential to engage learners actively in realistic learning environments where they can practice skills and care for patients without being overly concerned about harming the patients. Significant learning experiences such as simulation act to help prepare students for the realities of the health care field. The review of the literature identified the need for a solid base of knowledge regarding the most effective way to incorporate simulation in nursing curriculums (Bremner et al., 2006). This study examined simulation as a learning strategy, seeking to identify ways to utilize simulation effectively in nursing curriculums. This chapter provides a summary of the study, including a summary of the findings and conclusions, recommendations for practice and recommendations for further research.

Summary and Discussion of Results

The purpose of this study was to evaluate the use of simulation to impact the development of clinical self-efficacy in junior- and senior-level nursing students. This study also evaluated students' satisfaction with simulation as an education strategy.

Finally, this study evaluated the impact that the learner's role in the simulation had on clinical self-efficacy and learner satisfaction.

A quantitative evaluation design methodology was utilized in this study. Evaluation research is utilized to evaluate the effectives of a program or practice and seeks ways to improve the program of practice (Polit & Beck, 2008). The convenience sample included 103 junior- and senior-level nursing students. The students were randomly assigned to either the experimental group or the control group. Data was collected utilizing four Likert-scale instruments. Data was collected at the beginning of the semester and at the time of the simulation. Data was analyzed utilizing the *Statistical Package for the Social Sciences*.

This study was guided by three research questions:

1. Given the use of simulation in learning laboratory settings, what is the impact of high-fidelity simulation on clinical self-efficacy in junior- and senior-level nursing students?

2. Given the use of simulation in learning laboratory settings, what is the impact of high-fidelity simulation on learner satisfaction in junior- and senior-level nursing students?

3. Utilizing high-fidelity simulation, what is the impact of the role the learners play in the simulation on clinical self-efficacy and learner satisfaction on junior- and senior-level nursing students?

The literature review for this study focused on the concept of simulation, learning theories utilized in the development of simulations and the use of simulation in the education of health care professional. The concept of self-efficacy and clinical self-efficacy were also examined, along with the influence that self-efficacy and clinical self-efficacy may have on the academic success of students. Finally, the literature was reviewed regarding the impact that simulation may have on clinical self-efficacy.

The review of the literature described simulation as being theoretically-based on experiential learning theory, the theory of reflection and constructivist learning theory. Simulation was defined by Jeffries and Rogers (2007) as "activities that mimic reality and variously involve role-playing interactive videos, or mannequins that help students learn and allow them to demonstrate decision making, critical thinking and other skills" (p. 22). Simulation was described as a learning strategy that has the ability to create a learning environment that is realistic and that allows students to engage in active learning where they construct new knowledge and gain knowledge from fellow students' experiences.

The concept of self-efficacy was theoretically described by Bandura (1986) as the confidence an individual has to complete a task successfully. Learning experiences that have the ability to increase self-efficacy were described as being realistic, providing feedback in a timely manner, including examples of appropriate care, and having opportunities for the learning experience to allow time for learners to practice giving care to patients in a controlled environment (Lundberg, 2008). Simulation is a learning experience that creates a realistic patient setting where students may practice caring for patients in a controlled environment followed by a time of debriefing where feedback is given and the learner is encouraged to reflect on the experience. The literature reviewed supported this correlation between simulation and the learning activities that have been identified as having the ability to increase self-efficacy.

Research Question 1

The first research question addressed the impact of simulation on the clinical self-efficacy of junior- and senior-level nursing students. The findings revealed that both the

control group and the experimental group who participated in the simulation experience increased their self-efficacy scores. The findings also revealed that the experimental group had higher self-efficacy scores following the simulation than the control group, but the difference was not statistically significant.

The findings in this study revealed that there are many components that impact clinical self-efficacy. Both the control group and the experimental group experienced increased clinical self-efficacy scores, revealing that the general curriculum acted to increase the clinical self-efficacy scores of the students. The experimental group experienced a higher clinical self-efficacy score than the control group, but as previously stated, it was not a statistically significant difference. The students in this study participated in one high-fidelity simulation experience. This finding may be reflective of this limited participation in simulation experiences. The findings may have been different if the experimental group had engaged in other simulations throughout the semester.

Research Question 2

The second research question addressed the impact of simulation on learner satisfaction. The findings revealed that the students who participated in the simulation were satisfied with the experience. When the student levels for satisfaction with the simulation were compared to each other, level two students were significantly more satisfied than level four students.

The difference in satisfaction scores between the different levels of the curriculum is an interesting finding and could influence where simulations are placed in the curriculum. The types of simulations that are included in the curriculum at different levels and the simulations' perceived relevancy could also influence student satisfaction.

Placement of simulations within a curriculum should be carefully considered in order to optimize the impact of the simulations.

Research Question 3

The third research question addressed what impact the role the student played in the simulation had on clinical self-efficacy and learner satisfaction. The findings revealed that there was no statistically significant difference in the clinical self-efficacy scores of the learners based on the roles the learners played in the simulation. The findings also revealed that there was no statistically significant difference in learner satisfaction based on the roles the learners played in the simulation.

The findings of this research revealed that educators may not need to worry about the fact that not all students will get to play the role of primary or secondary nurse. Many educators believe that the student who is playing the role of the primary nurse would benefit more from the simulation experience than the student who is playing the role of an observer. Although there are some identified differences, the differences were not statistically significant.

Conclusions

Research Question 1

The findings in this study are reflective of what was found in the literature review. The review of the literature revealed limited and inconsistent findings related to the impact of simulation on clinical self-efficacy (Jeffries & Rizzolo, 2006; Maibach et al., 1996; Marshall et al., 2001). Jeffries, et al. (2003) taught students how to perform a 12-lead electrocardiogram utilizing two different methods but found no significant difference

in the clinical self-efficacy of the two groups. Meier et al. (2005) conducted a study that incorporated simulation throughout the curriculum in medical education. They found that the surgical residents who participated in a partially simulation-based curriculum had higher self-efficacy scores at the end of the curriculum. Clinical self-efficacy has been identified as an important component of nursing education and as a possible factor in the ability of nursing students to provide appropriate care to patients in a dynamic fast-changing health care environment (Lundberg, 2008). The question that puzzles nursing educators is what will increase a student's clinical self-efficacy.

Simulation has been identified as possessing several of the concepts that have been shown to increase self-efficacy (Leyshon, 2002). *The Nursing Education Simulation Framework* describes the collaborative relationship that exists between the educator and students and further describes how this relationship, along with the design characteristics of the simulation, impact learning outcomes (Jeffries, 2007). Each group of students and educators who participate in a simulation bring different personal characteristics to the simulation. During a simulation, the educator functions as a facilitator, while students, who are expected to be self-directed, actively participate in the simulation. The simulation is followed by a debriefing period where students reflect on the simulation, discussing it to determine other courses of action that might have been taken during the simulation experience.

Simulations are being integrated into the curriculum at the university where the research was conducted. This integration is in the beginning phases. One simulation was conducted at each curriculum level during the semester. Based on the research findings,

questions need to be addressed about the number of simulations that are appropriate for each level, along with the complexity and quality of the simulations.

Research Question 2

The finding of overall student satisfaction with the simulation agrees with what was found in the literature. Seropian et al. (2004) reported that learners preferred high-fidelity simulation to other levels of simulations. Kuznar (2007) reported that learners were satisfied with the high-fidelity simulation and also felt that it was reflective of the clinical setting. Additionally, Kuznar reported that the students felt that the simulation experience increased their confidence level regarding caring for patients in the clinical setting.

Chickering and Gamson (1987) wrote about seven principles of good practice in undergraduate education, stating that students who had satisfying learning experiences performed at a higher level. Nursing educators realize that most students find clinical experiences in the acute care setting to be satisfying. As clinical sites become more difficult to obtain, educators are seeking alternative experiential strategies that will assist the learners in meeting the course objectives. Simulation may be one possible strategy.

The findings of this study revealed that there are differences in the satisfaction scores based on the level of the student. The level four students, who were seniors in their final undergraduate semester, did not find the simulation as satisfying as the students in the other levels. The three components of the simulation, i.e., the facilitator, the student group, and the simulation design, work together and will produce slightly different outcomes each time the simulation is run. Simulation experiences should be continuously evaluated to ensure the quality of the simulation experience. When students are able to

participate in learning experiences that are satisfying, they may put more effort into learning and persist longer when the learning environment is challenging. Satisfying learning experiences, where students are actively engaged in their learning, may assist in increasing students' self-efficacy.

Research Question 3

The finding that role does not significantly influence clinical self-efficacy or learner satisfaction provides nursing educators with valuable information regarding the use of simulation. The review of the literature revealed that there was a limited amount of information regarding the impact of the role the students play in a simulation on clinical self-efficacy and learner satisfaction. Jeffries (2007) reported that there was no significant difference in learner satisfaction or self-confidence based on the role played in the simulation. The finding of this study, that role did not significantly influence clinical self-efficacy or learner satisfaction, supported Jeffries' finding.

Self-efficacy is influenced by a variety of factors. Bandura (1986) stated that self-efficacy is influenced by experiences both past and present, observations of others, verbal encouragement and psychological factors, such as fear or anxiety. Simulations provide a learning environment that is experiential, with immediate feedback, and also includes the observation of fellow participants. Simulations may also be anxiety-provoking to some students who have low self-efficacy. This low self-efficacy may impact the benefit the students receive from the simulation.

No matter what role a learner plays in a simulation, it is important that learners be actively engaged in learning and that they be satisfied with their learning experiences (Fink, 2003). Learners who are actively engaged in satisfying learning experiences may

begin to take charge of their own learning, developing a desire to become life-long learners. In nursing education, it is important to assist learners in becoming life-long learners, because health care is a profession where change is constant.

Implications

The findings of this research study highlight some of the major priorities in utilizing simulation in nursing education. The findings of this study may serve as a guide to nursing educators as they integrate simulation into nursing curriculum in an educational environment where funding and faculty time are limited. Of particular significance to nursing educators is the challenge of designing and placing simulation experiences in the curriculum in order to enhance the student learning experience.

Simulation should be integrated into the curriculum so that beginning students participate in simple simulations, with the level of complexity of the simulation experience increasing as the students' levels of knowledge and experience increase. Beginning students would start off with simple scenarios and as they progress through the curriculum, move to more complex simulations that depict the types of patients they will encounter in a clinical setting, e.g., an intensive care unit or the emergency room.

Simulations should be carefully planned, with clear objectives. Objectives provide the learners with a direction for the learning activity. As learners examine the objectives for a simulation, they can begin to envision the scope and direction of the simulation. The objectives will act to assist the learner to plan the care for the simulated patient they are caring for.

Debriefing is an integral part of simulation. Debriefing should occur immediately following the simulation. It is during the debriefing time that the learners have the opportunity to reflect on the simulation and discuss their experiences. It is during this time period that learners use their critical thinking skills to analyze what happened during the simulation and decide what changes they would make in the care provided to the patient. The process of working together as a group allows the learners to work together and learn from each other. The literature also identified the importance of the debriefing period. Students who participated in simulations stated that they found the simulations to be beneficial (Jeffries & Rizzolo, 2006).

Simulation should be evaluated to determine the effectiveness of the simulation experiences. Each simulation should be evaluated following the simulation experience and adjustments made as necessary. Tools that have been determined to be valid and reliable should be utilized to evaluate the simulation and experience. It is through evaluation that problem areas within a simulation may be identified, thus creating a simulation experience for the students that will meet their learning needs effectively.

Faculty members should be trained in the use of simulation as a teaching strategy. The effective use of simulation requires funding and training. Faculty members sometimes do not utilize simulation because they lack the necessary skills (King et al., 2008). Many times, faculty members are also reluctant to change teaching strategies unless presented with solid information regarding the effectiveness of the strategy. As simulation is introduced into a curriculum, faculty members need to make decisions collaboratively regarding how they will utilize simulation. As schools of nursing make

plans to integrate simulation into their curriculum, they should develop a vision and a plan that will facilitate the successful integration of simulation.

Generalizing the Study

The findings of this study have limited generalizability due to the limitations that were identified. The first limitation was the method of sampling that was utilized in the study. The sample that was utilized was a convenience sample. The second limitation was the size of the sample. The size of the sample was small, making the information obtained limited in its usability (Gall, Gall, & Borg, 2007). Also, because this was an evaluation study where one university setting was used to collect data, the generalizability of the findings is limited. As a result of these limitations and the findings of the study, there are identified recommendations for further research.

Recommendations for Further Research

After reviewing the data, recommendations for further research include

1. Replication of this study in other, similar-type schools of nursing. This study could also be expanded to include incorporating more simulations throughout the semester and then collecting data at the end of the semester.

2. A longitudinal study that would examine the impact simulation has on self-efficacy and how long this impact lasts following a simulation.

3. A study that would examine the use of simulation to replace part of the overall clinical experience, with particular emphasis on learner satisfaction and knowledge acquisition. This research could also include a component that examined how the knowledge acquired during a simulation would transfer to the actual clinical setting.

4. A study that would evaluate tools that examine the effectiveness of the simulation and evaluation tools that accurately evaluate the performance of the learners who

participate in a simulation. The need for tools that evaluate clinical competence in a simulation is a concern for nursing educators. Educators may believe that simulation improves clinical skills and learner clinical self-efficacy. However, without evaluation tools that are valid and reliable, the educator does not have an effective or accurate way to evaluate student performance.

Conclusion

Bandura (1986) stated that self-efficacy is influenced by a variety of factors, including experiences, observations of others, verbal encouragement and psychological factors, such as fear and anxiety. Self-efficacy has been reported to play a major role in the successful transition from student to practitioner (Lundberg, 2008). Acute care facilities expect schools of nursing to prepare learners to face the realities of the complex health-care arena the learners will enter upon graduation. Nursing educators are continually seeking educational strategies that will increase the abilities of a graduate to transition successfully into the professional nursing role. Simulation has been identified in the literature as a teaching strategy that may increase a learner's clinical self-efficacy. This study has confirmed that learners enjoy participating in simulations and find them rewarding and educationally satisfying. This study has further confirmed that simulation has the ability to increase the clinical self-efficacy of learners. The knowledge obtained from this study will serve to stimulate further research and discussion regarding the use of simulation in nursing education.

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