Students' Perceived Learning Effectiveness: The Relationship between the Level of Fidelity in Nursing Simulation, Traditional Clinical Experiences, and the Learning Objectives

by

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Abstract

There is an increase in the use and acceptance of simulation in nursing education. Conflicting data exists regarding the level of fidelity required for effective learning. With the increasing use of simulation in nursing education, simulation is replacing some of the traditional clinical experiences for students. There is a dearth of data comparing simulation and traditional clinical experiences. This is especially true for low-fidelity simulations.

The purpose of this study was to explore the relationship of baccalaureate nursing students' perceived learning effectiveness using the Clinical Learning Environments Comparison Survey (CLECS) of different levels of fidelity simulation based on the learning objectives, and traditional clinical experiences. The CLECS's subscales after confirmatory factor analysis are communication, nursing leadership, and teaching-learning dyad. The null hypothesis is there is no relationship between the identified students' perceived learning effectiveness subscale (communication, nursing leadership, and teaching-learning dyad) and the fidelity of the simulation.

A convenience sample of 103 first semester baccalaureate nursing students enrolled in a required fundamental/assessment clinical course and 155 fifth semester baccalaureate nursing students enrolled in a required leadership clinical course participated in this study. The simulations and traditional clinical experiences were required clinical components of the courses. However, only students who provided informed consent and agreed to complete the required instruments were included in the study.

A descriptive correlational design was used for this cross-sectional study to evaluate students' perceptions after a simulation experience and the completion of the traditional clinical experiences. The CLECS tool for student perceived learning effectiveness was used for both clinical experiences. The null hypothesis was not retained for the subscales: communication, nursing leadership, and teaching-learning dyad depending on the objectives of the simulated clinical experience. However, the communication subscale showed tendency towards preference of traditional clinical experiences in meeting students perceived learning for communication.

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CHAPTER 1. INTRODUCTION

Over the past decade, increasing numbers of nursing programs have incorporated the use of low- to high-fidelity simulation in the education of nursing students (Nehring, 2010). Fidelity refers to how closely the simulation is designed to replicate reality (INACSL, 2011). Multiple research studies have revealed that students prefer higher levels of fidelity when reporting their level of satisfaction with simulated learning opportunities (Jeffries & Rizzolo, 2006; Lapkin, Levett-Jones, Bellchambers, & Fernandez, 2010). Some studies suggest simulation significantly increases knowledge (Gates, Parr, & Hughen, 2012; Howard, Ross, Mitchell & Nelson, 2010; Lapkin, et al., 2010; Tiffen, Corbridge, Shen, & Robinson, 2010); competence (Butler, Veltre, & Brady, 2009; McGaghie, Issenberg, Petrusa, & Scalese, 2009), self-efficacy (Kameg, Howard, Clochesy, Mitchell, & Suresky, 2010), and confidence (Cooper et al., 2011; Tiffen, et al., 2010). However, studies have not repeatedly shown that high-fidelity simulation increased undergraduate nursing students learning of clinical reasoning skills (Lapkin, et al, 2010).

The International Nursing Association for Clinical Simulation and Learning *Standards of Best Practice: Simulation* (2013) Standard Three states, "All simulation-based learning experiences begin with development of clearly written participant objectives, which are available prior to the experience" (p. S16). Jeffries (2007) also states one of the most important aspects of simulation design is clearly stated, well-written objectives. Objectives are essential for effective learning experiences to meet the outcome goal(s). There is a dearth of empirical evidence for simulation practices. The assumption that simulation should be designed on simulation

objectives and participant's experience level, not the level of simulation equipment fidelity, is based on expert opinion and anecdotal experiences.

Problem Statement

There is an increase in the use and acceptance of simulation in nursing education. Conflicting data exists regarding the level of fidelity required for effective learning. However, there is also a shortage of evidence comparing student perceived effectiveness of simulation experiences compared to traditional clinical experiences. This is especially true for low-fidelity simulations.

Conceptual Framework

One framework and one theory were chosen for this study. The National League for Nursing-Jeffries Simulation Framework (NLN/JSF) was selected because it looks at the relationship between the learners, the simulation design, and the outcome goal of simulated clinical experiences. Kolb's Experiential Learning Theory (ELT) was selected because of its previous use in nursing and how this theory relates to the need for nursing students to practice and apply skills and knowledge. The NLN/JSF and Kolb's ELT will be discussed in more detail in Chapter Two. The following is a brief overview of the conceptual framework and theory.

National League for Nursing-Jeffries Simulation Framework (NLN/JSF)

The conceptual framework for this study is based on the National League for Nursing-Jeffries Simulation Framework (NLN/JSF) (Jeffries, 2007) which was developed for use in nursing education in order to design, implement, and evaluate simulation experiences. This model depicts the triadic relationship of students, faculty, and educational practices and their influence on the simulation design and desired outcomes. One of the simulation design characteristics is objectives and information, along with the complexity of the simulation, when

designing the simulated clinical experience. The simulation design characteristic in the NLN/JSF includes the learning objectives, fidelity of the simulation, the level of complexity appropriate for the learner, support for the students' learning, and reflection/debriefing after the learning experience (Jeffries, 2007).

Kolb's Experiential Learning Theory (ELT)

The theoretical framework for this intervention is Kolb's Experiential Learning Theory. Experiential Learning Theory (ELT) defines experiential learning as a process that is created through transforming the experience into application (Kolb, 1984). Patient care practice, as with any experiential learning concept, is not fixed. There are elements that can be formed and reformed throughout the experience. This explains how information learned and practiced in the skills/simulation laboratory is not always transferred into clinical practice.

Purpose of the Study

The purpose of this study was to explore the relationship of students' perceived learning effectiveness of different levels of fidelity simulation based on the learning objectives and traditional clinical experiences based on the learning objectives. The relationship was also explored between students' perceived effectiveness of simulation and traditional clinical experiences.

Research Questions

Among baccalaureate nursing students at a single southeastern university and measuring perceived learning effectiveness using the Clinical Learning Environments Comparison Survey (CLECS) with the subscales of communication, nursing leadership, and teaching-learning dyad:

1. What is the relationship between first semester students' perceived learning effectiveness on communication and teaching-learning dyad for an initial inpatient care

medium-fidelity manikin and mid-level environmental fidelity simulation, and traditional clinical experience?

2. What is the relationship between fifth semester students' perceived learning effectiveness on nursing leadership and teaching-learning dyad for a leadership multiple patient care low-fidelity manikin and mid-level environmental fidelity simulation, and leadership traditional clinical experience?
3. What is the relationship between students' perceived learning effectiveness on communication, nursing leadership, teaching-learning dyad, and sum total score in simulation, and traditional clinical experience?

Significance of the Study

With the increasing use of simulation in nursing education, simulation is replacing some of the traditional clinical experiences for students. There is a dearth of data comparing simulation and traditional clinical experiences. Most of the studies on simulation effectiveness are conducted with high-fidelity simulators. However, high-fidelity simulators are very costly and are not necessary to achieve some outcomes. The fidelity of the simulation should be based on the goals and outcomes desired, not the equipment available. Findings from this study may add to the body of knowledge and evidence required to guide nurse educators in the effective use of simulation strategies. The null hypothesis is there is no relationship between the identified students' perceived learning effectiveness subscale (communication, nursing leadership, and teaching-learning dyad) and the fidelity of the simulation.

Limitations

Several limitations are identified for this study. The limitations are as follows:

1. Learners that participated in this study were volunteers from one large land grant southeastern university. Their results may be different from those that chose not to participate and those at other institutions.
2. This study used convenience sampling of baccalaureate nursing students enrolled in a junior-level first semester assessment/fundamentals course and two senior-level fifth semester leadership courses. Therefore, results cannot be generalized to groups at different levels in their nursing school education.
3. The learners lacked diversity in demographics including ethnicity, gender, and education experiences. Therefore, results cannot be generalized to all groups.
4. Self-reported data collection methodology was used. This methodology cannot be guaranteed, which limits generalizability.
5. There was some variability in communication and learning experiences between the learners and the facilitators in the simulation. Scripts were used but the experience varied depending on the learner's action or non-action.
6. There was some variability in communication and learning experiences between the learners and the clinical faculty in the traditional clinical experiences. Each learner and patient is an individual causing variability in each interaction. This may limit the generalizability of the findings.

Delimitation

The study was limited to first semester nursing students enrolled in a fundamental/assessment course and fifth semester nursing students enrolled in nursing leadership courses including traditional inpatient and simulated clinical experiences.

Assumptions

There are several assumptions made for this study. The assumptions are as follows:

1. The learner understands the nature of the questions on the CLECS instrument and answers the questions accurately and honestly.
2. The learner is willing to participate and engage in the active learning experiences in the simulation and traditional clinical experiences.
3. The simulated clinical experiences and traditional clinical experience will be comparable for all learners.

Definitions

1. *Baccalaureate Nursing Students* – individuals enrolled in a four-year academic institution's nationally accredited school of nursing degree program.
    a. *First Semester Nursing Students* – are enrolled in their first semester clinical course (fundamentals/assessment course) in a five semester undergraduate program.
    b. *Fifth Semester Nursing Students* – are enrolled in their fifth semester clinical course (leadership courses) in a five semester undergraduate program.
2. *Clinical Faculty* – the school of nursing faculty or a clinical adjunct faculty hired to supervise/facilitate clinical inpatient clinical experiences for the school of nursing students.
3. *Clinical Judgment* - "The art of making a series of decisions to determine whether to take action based on various types of knowledge. The individual recognizes changes and salient aspects in a clinical situation, interprets their meaning, responds appropriately, and reflects on the effectiveness of the intervention. Clinical judgment is influenced by the

individual's previous experiences, problem-solving, critical thinking, and clinical reasoning abilities" (Meakim, et al., 2013, p. S4).

4. *Clinical Reasoning* – "The ability to gather and comprehend data while recalling knowledge, skills (technical and nontechnical), and attitudes about a situation as it unfolds. After analysis, information is put together into a meaningful whole when applying the information to new situations" (Meakim, et al., 2013, p. S4).
5. *Clinical Scenario* – "The plan of an expected and potential course of events for a simulated clinical experience. The clinical scenario provides the context for the simulation and can vary in length and complexity, depending on the objectives. The clinical scenario design includes:
    - Participant preparation
    - Prebriefing (Briefing): a review of objectives, instructions prior to implementation of scenario, questions, or other resources used in the scenario
    - Patient information describing the situation to be managed
    - Participant objectives" (Meakim, et al, 2013 p. S4).
6. *Communication* – The focus on preparing to care for the patient, communicating with the interdisciplinary team, interacting with the patient, and providing information and supporting the patient's family members (Leighton, 2007).
7. *Competence* - "Standardized requirement for an individual to properly perform a specific role. It encompasses a combination of discrete and measureable knowledge, skills, and attitudes that are essential for patient safety and quality patient care" (Meakim, et al, 2013 p. S5).

8. *Critical Thinking* – "A disciplined process that requires validation of data including any assumptions that may influence thoughts and actions, and then careful reflection on the entire process while evaluating the effectiveness of what has been determined as the necessary action(s) to take. This process entails purposeful, goal-oriented thinking and is based on scientific principles and methods (evidence) rather than assumptions or conjecture" (Meakim, et al, 2013 p. S5). For the CLECS, the focus is on anticipating and recognizing changes in the patient's condition, and taking appropriate action with the changes in the patient's condition (Leighton, 2007).
9. *Environmental Fidelity* – "Refers to the degree to which the simulated environment (manikins, room, tools, equipment, moulage, and sensory props) approximates reality" (Meakim, et al, 2013 p. S6).
10. *Facilitation* – "A method and strategy that occurs throughout (before, during, and after) simulation-based learning experiences in which a person helps to bring about an outcome(s) by providing unobtrusive guidance" (Meakim, et al, 2013 p. S6).
11. *Facilitator* – An individual who provides guidance, support, and structure during simulation-based learning experiences" (Meakim, et al, 2013 p. S6).
12. *Fidelity* – "Believability, or the degree to which a simulated experience approaches reality; as fidelity increases, realism increases. The level of fidelity is determined by the environment, the tools and resources used, and many factors associated with the participants. Fidelity can involve a variety of dimensions, including (a) physical factors such as environment, equipment, and related tools; (b) psychological factors such as emotions, beliefs, and self-awareness of participants; (c) social factors such as participant

and instructor motivation and goals; (d) culture of the group; and (e) degree of openness and trust, as well as participants' modes of thinking" (Meakim, et al, 2013 p. S6).

13. *High-Fidelity* – "Experiences using full scale computerized patient simulators, virtual reality or standardized patients that are extremely realistic and provide a high level of interactivity and realism for the learner" (NLN-SIRC, 2013).
14. *Holism* – The focus on all aspects of the patient care including assessing the outcomes of care provided, short- and long-term nursing goals, and the needs of the patient (psychosocial, developmental, spiritual, and cultural) (Leighton, 2007).
15. *Human Patient Simulator (HPS)* – "A computerized, full-body manikin that is able to provide real-time physiological and pharmacological parameters of persons of both genders, varying ages, and with different health conditions" (Nehring, Ellis, & Lashley, 2001, p.195).
16. *Knowledge* – "The awareness, understanding, and expertise an individual acquires through experience or education" (Meakim, et al, 2013 p. S7).
17. *Clinical Learning Environments Comparison Survey (CLECS)* – A self-reported tool to compare the traditional clinical environment and the simulated clinical environment using a one to four-Likert scale along with an option of not applicable. There are six subscales: self-efficacy, teaching-learning dyad, holism, communication, nursing process, and critical thinking (Leighton, 2007). There are only three subscales for this study after confirmatory factor analysis: communication, nursing leadership, and teaching-learning dyad.

18. *Low-Fidelity* – "Experiences such as case studies, role playing, using partial task trainers or static mannequins to immerse students or professionals in a clinical situation or practice of a specific skill" (NLN-SIRC, 2013).
19. *Manikins* – Are models of the human body with varying levels of fidelity.
    a. The low-fidelity manikins do not incorporate the realism of an interactive human body, such as rising chest with respiration or heart/lung sounds. These are used for psychomotor skill task training.
    b. Medium-fidelity manikins incorporate more life-like replication of the human body. There are heart and lung sounds but the chest does not rise with respirations.
    c. High-fidelity manikins are the most realistic and imitate human beings with eye blinking, chest rising with respirations, heart and lung sounds, and palpable pulses.
20. *Mid-Level Environmental Fidelity* – Actual equipment in the hospital setting is used in the simulated clinical experience; however, it is not working as expected for patient use. Examples of this are the oxygen flow meter without air flowing and floating the liters/minute indicator or the intravenous fluid pump not turned on but with tubing and fluids with a label displaying the rate of infusion (Paige and Morin, 2013).
21. *Mock Hospital or Initial Patient Care Simulated Clinical Experience* – The initial clinical experience of first semester baccalaureate nursing students in a five semester program that occurs in the simulation laboratory. Two students provide care for one medium-fidelity manikin patient with the focus on learning the expectations of traditional clinical rotations. Emphasis is placed on communication, providing basic nursing care,

developing a plan of care, and patient problem recognition (Gore, Hunt, Parker, and Raines, 2011).

22. *Moulage* – "Techniques used to simulate injury, disease, aging, and other physical characteristics specific to a scenario. Moulage supports the sensory perceptions of participants and supports the fidelity of the simulation scenario through the use of makeup, attachable artifacts (e.g., penetrating objects), and smells" (Meakim, et al, 2013 p. S7).
23. *Nursing Process* –The understanding of rationale for patient's treatment plan and patient's pathophysiology, identifying patient's problems, implementing care plan, prioritizing care, and performing appropriate assessments (Leighton, 2007).
24. *Objective* – "Statement(s) of specific measurable results that participant(s) is expected to achieve during a simulation-based learning experience" (Meakim, et al, 2013 p. S7).
25. *Outcome (Goal)* – Measurable results of the participants' progress toward meeting a set of objectives. Expected outcomes are the change in knowledge, skills, or attitudes as a result of the simulation experience" (Meakim, et al, 2013 p. S7).
26. *Participant* – "One who engages in a simulation-based learning activity for the purpose of gaining or demonstrating mastery of knowledge, skills, and attitudes of professional practice" (Meakim, et al, 2013 p. S7).
27. *Reflective Thinking* – "The engagement of self-monitoring that occurs during or after a simulation experience. Considered an essential component of experiential learning, it promotes the discovery of new knowledge with the intent of applying this knowledge to future situations. Reflective thinking is necessary for metacognitive skill acquisition and clinical judgment and has the potential to decrease the gap between theory and practice.

Reflection requires the creativity and conscious self-evaluation to deal with unique patient situations" (Meakim, et al, 2013 p. S8).

28. *Self-Efficacy* – A self-judged perception about whether one can successfully perform required actions (Bandura, 1977). For this study, the focus is on reacting calmly to changes in the patient's condition, knowing what to do if an error occurs, and being confident in decision-making and nursing abilities (Leighton, 2007).
29. *Simulated Leadership Multiple Patient Care Experience* – A simulated clinical experience occurring in the fifth semester of a five semester baccalaureate of nursing program that requires students to assume care of four low-fidelity manikin patients with the focus on leadership skills, prioritization, time management, and delegation.
30. *Simulated Learning Environment* – "A physical location where a simulation-based learning experience takes place and where a safe atmosphere is created by the facilitator to foster sharing and discussion of participant experiences without negative consequences. The simulation learning environment should facilitate trust and foster learning and support the development of professional and interprofessional competency" (Meakim, et al, 2013 p. S9).
31. *Student Perceived Learning Effectiveness* – Student reported measurement of his/her perception of the effectiveness of the learning that occurred in the simulated and traditional clinical experiences (Leighton, 2007).
32. *Teaching-learning dyad* – There are many factors that enhance or interfere with teaching and learning. In traditional and simulated clinical learning environments, the teaching-learning dyad is the process of the instructor availability, being challenged and stimulated

to learn, immediate feedback on performance, support of the facilitator, and improving critical thinking skills (Leighton, 2007).

33. *Traditional Leadership Clinical Rotation* – The clinical rotation in the fifth semester of a five semester program where nursing students function in the role of a registered nurse. This includes management of a team of patients for 12-hour shifts for three days, and one day function as a charge nurse for three classmates and their patients.

Study Organization

Chapter 1 introduces the study including a background, statement of the problem, the use of a theory and conceptual framework, study purpose, and the significance of the problem. Limitations, delimitations, and assumptions are identified. Research questions are identified along with definitions of terms.

Chapter 2 includes a literature review.

Chapter 3 describes the population and sample along with the instrument used for data collection. The data collection and data analysis process are explained.

Chapter 4 presents the study findings.

Chapter 5 contains a summary of the study along with conclusions and recommendations for further practice and research.

CHAPTER 2: REVIEW OF LITERATURE

Purpose of the Study

The purpose of this study was to explore the relationship of students' perceived learning effectiveness of different levels of fidelity simulation based on the learning objectives and traditional clinical experiences based on the learning objectives. The relationship was also explored between students' perceived effectiveness of simulation and traditional clinical experiences.

Research Questions

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3. What is the relationship between students' perceived learning effectiveness on communication, nursing leadership, teaching-learning dyad, and sum total score in simulation, and traditional clinical experience?

Simulation Research Comparing Levels of Fidelity

Increasing numbers of nursing programs have incorporated the use of low- to high-fidelity simulation in the education of nursing students in the past decade (Nehring, 2010). Fidelity refers to how closely the simulation is designed to replicate reality (INACSL Board of Directors, 2011; Meakim et al., 2013). Some have questioned whether the high cost of high-fidelity simulators is worth the investment if there is no difference in student outcomes. The high cost of simulations also warrants more research to identify how and when simulations should be used for cost effectiveness while still meeting learning outcomes. Models have been created and studies have been conducted to examine factors that influence learning outcomes in simulation (Jeffries, 2007, 2012; Reed, 2012). However, there is no general agreement on when and how to best use the simulation technology (Cant & Cooper, 2010; Weaver, 2011) with persistent calls for additional rigorous empirical research (LaFond & Vincent, 2012; Schiavenato, 2009).

Students have repeatedly stated they prefer higher levels of fidelity when reporting their level of satisfaction with simulated learning opportunities (Jeffries & Rizzolo, 2006; Lapkin, Levett-Jones, Bellchambers, & Fernandez, 2010). Simulation has been shown to significantly increase knowledge (Gates, Parr, & Hughen, 2012; Howard, Ross, Mitchell, & Nelson, 2010; Lapkin et al., 2010; Tiffen, Corbridge, Shen, & Robinson, 2010); competence (Butler, Veltre, & Brady, 2009; McGaghie, Issenberg, Petrusa, & Scalese, 2009), self-efficacy (Kameg, Howard, Clochesy, Mitchell, & Suresky, 2010), and confidence (Cooper et al., 2011; Tiffen, et al., 2010).

Student participation in a simulated clinical experience has also demonstrated effectiveness in preparing students for transitioning from laboratory to patient care. Improvements have been noted with a statistically significant decrease in anxiety (Gore, Hunt, Parker, & Raines, 2011; Gore, Hunt, & Raines, 2008; Ham & O'Rourke, 2004), and increase in students' self-perceived improvements and satisfaction, depending on the level of fidelity used in simulation (Gore, Leighton, Sanderson, &Wang, 2014; Grady et al., 2008; Jeffries & Rizzolo, 2006; Lapkin et al., 2010).

Improvement with student performance in patient care was demonstrated after simulation (Meyer, Connors, Hou, & Gajewski, 2011; Radhakrishnan, Roche, & Cunningham, 2007). However, Lapkin and colleagues (2010) state simulation studies have not repeatedly shown that high-fidelity simulation increased undergraduate nursing students learning of clinical reasoning skills. When comparing varying levels of fidelity as a teaching strategy, no statistically significant differences in student learning outcomes or performances were noted (De Giovanni, Roberts, & Norman, 2009; Friedman et al., 2009; Kardong-Edgren, Anderson, & Michaels, 2007; Kardong-Edgren, Lungsrom, & Bendel, 2009; Kinney & Henderson, 2008; Lee, Grantham, & Boyd, 2008). Blum, Borglund and Parcells (2010) reported improvement, but not statistically significant, in self-confidence or competence with first semester baccalaureate nursing students using high-fidelity simulation.

Kardong-Edgren, Anderson and Michaels (2007) inquired to learn how much fidelity contributed to improved measurable learning outcomes as compared to traditional lectures and teaching. A pre-test and post-test method was used for fourteen students divided into three groups: lecture only, lecture with low-fidelity simulation, and lecture with high-fidelity simulation. An improvement in scores for the two fidelity groups over the lecture only group

was noted, but it was not statistically significant. This study suggests that an Objective Structured Clinical Examination (OSCE) may be needed for measuring learning outcomes instead of relying solely on a paper and pencil examination.

Kardong-Edgren, Lungstrom and Bendel (2009) compared measurable outcomes of student performance with high- and low-fidelity to determine if the associated costs of increasing fidelity were warranted. Since the ultimate objective outcome measure for nursing is passing the NCLEX exam upon graduation, multiple choice testing is a method commonly used to measure outcomes. The students were divided into one of three groups: lecture only, lecture with high-fidelity simulation, and lecture with medium-fidelity simulation. Testing occurred as a pre-test, and post-test at two weeks and six months. All groups showed significant increase in post-test knowledge at two weeks. However, all groups had a significant decrease in retention of knowledge on the post-test at six months. Therefore, no difference was noted with varying the level of fidelity. Interestingly, no difference in student satisfaction with simulation fidelity was noted. The results led the researchers to question whether the expense of high-fidelity was worth the cost since there were no group differences with the paper and pencil examinations. However, is there a better measure for assessing outcomes with simulation?

Keene (2009) suggested using the framework of Patricia Benner, novice to expert, to build a simulation program. This is applicable to first semester nursing students due to the fact that they were novices to being nursing students. This study suggested that simulation and skills attainment should begin with the psychomotor skills and scaffold to critical thinking and clinical judgment skills to successfully provide multifaceted care as the student progressed. The simple to complex approach was reported as the best method to teaching students to avoid overwhelming them and promoted learning for beginning nursing students. In order to

accomplish this, the instructors need to begin the students' experiences with simple skills and then increase the complexity of the skills or scenarios as the students' abilities advance.

De Giovanni, Roberts and Norman (2009) evaluated the effectiveness of Harvey, the Cardiac Simulator™ (high-fidelity group), and the computer disk (CD) (low-fidelity group) program for assessing cardiac sounds along with the students' ability to recognize and assess cardiac sounds in actual human patients. The study group had 37 participants. The intervention had both groups receiving a one-hour instructional session followed by three hours of Harvey instruction. The low-fidelity group also had three hours of CD instruction. Six weeks later an OSCE was performed with each student examining five out of eight patients with stable abnormal heart sounds and a station for CD sounds. After assessing the patients, the students charted their findings. Inter-rater reliability was performed for rating communication and assessment skills. A small pilot sample (n=10) was used with the high-fidelity group, which scored 72% correct on Harvey and 36% correct on CD test. However, the low-fidelity group scored 60% correct on both Harvey and the CD test. The findings did not reveal a statistically significant improvement with high-fidelity. The authors suggested more research was needed.

Brydges and colleagues (2010) compared self-guided learning versus proficiency-based training without determined proficiency standards. The authors of this study believed self-guided learning is a collaborative effort between the student and the educator working together within the defined curriculum. The experimental participants increased their use of fidelity as their proficiency with performing the skill increased and transitioned between the different simulators as needed. The control group followed a set schedule of increasing the fidelity of the skill. This study was performed on baccalaureate nursing students performing intravenous catheterizations. The experimental group stated a preference for the progressive practice

schedule at a rate of 73%. No statistically significant difference was noted between the students' performance from either group. The authors recommend further research is needed to determine the right mix for optimum result.

The NLN/Laerdal Study

Jeffries and Rizzolo (2006) conducted a national, multi-site, multi-method study to develop and test models for simulation, develop nursing simulation faculty, and contribute to the body of knowledge of nursing education and simulation. The goals of this project were to explore simulation design, simulation as an effective teaching strategy, and evaluate learning outcomes.

The first phase was to develop eight project leaders and a project coordinator to develop the simulations for implementation for consistency in the eight sites based on the simulation framework. Of the sites included, 62% were baccalaureate degree programs and 38% were associate degree programs. A review of literature was conducted to identify gaps in simulation research. Based on the literature review, the team developed the NLN Simulation Framework. The researchers identified the lack of appropriate and adequate simulation evaluation tools to measure the simulation outcomes identified for the study. The evaluation tools developed were the Simulation Design Scale (SDS), Educational Practices in Simulation Scale (EPSS), and the Student Satisfaction and Self-Confidence in Learning (Jeffries & Rizzolo, 2006).

Phase two was the operationalization period for the project leaders and their faculty to develop, implement and evaluate the simulations using the simulation framework for medical-surgical nursing. Six sites used a high-fidelity simulator, one site used an IV simulator and one site used a low-fidelity manikin. The project leaders were to evaluate the simulations and the outcomes of the simulations using the SDS and EPSS. The project director reviewed the data

from all sites and determined the simulation scenario for basic post-operative care would be used in the students' first clinical semester for phase three.

Phase Three had two components. The first component was to determine students' knowledge level prior to simulation. The second component was to evaluate the learning outcomes when all three levels of fidelity were used. The participants (n=403) were mostly white (77%) and female (87%). Each participant completed a 12-item pre-test and viewed a video with lecture material on post-operative care including a simulation to demonstrate the care delivered to a post-operative patient. The students were then assigned to one of the simulation groups: 1) paper/pencil case study simulation; 2) hands-on simulation using a low-fidelity manikin; and 3) hands-on simulation using a high-fidelity manikin.

Phase Four was the analysis portion of this study. The researchers identified the results were based on only one type of simulation. Therefore, the project director implemented using two levels of simulation for the study in phase four. Two of the eight research sites participated in phase four. One half of the participants (n=55) had the paper/pencil case study first then the high-fidelity simulation. The other half of the participants (n=55) had the high-fidelity simulation first then the paper/pencil case study.

The results of this study identified that debriefing was the most important simulation design. Component one of phase three was measured using the SDS instrument. Learning occurred in the traditional learning environment; however, learning was enhanced with active learning strategies with simulation to increase their confidence. High-fidelity simulation represented more reality than the other two methods of simulation. The manikin simulations provided more opportunities for problem solving experience than the paper/pencil case study.

Debriefing was seen as more important with the manikin simulations than the paper/pencil case study.

Component two was measured using the EPSS instrument. The high-fidelity simulation participants felt more involved in diverse learning. Participants involved in manikin simulation rated active learning as more important in their learning experience. The participants in the paper/pencil case study perceived higher expectations to perform better and more collaboration than the participants in manikin simulation.

The conclusion of this study for phase three revealed there were no statistical differences in knowledge between all groups. There were no statistical differences in satisfaction or self-confidence between the groups. Phase four results revealed high-fidelity simulation used more diverse strategies for learning than the paper/pencil case study. High-fidelity simulation used best practices in education principles. Self-confidence is promoted more with high-fidelity simulation than paper/pencil case study along with increased participant satisfaction.

NLN Assessment and Evaluation Tools Used in Simulation Research

Simulation Design Scale (SDS)

The SDS is a 20-item tool that has two parts: one for the presence of the features in simulation and the second about the importance of those features. The design is a five point Likert-type scale with subscales measuring the five simulation design features – objectives, support, problem solving, feedback, and fidelity. Response options range from “strongly agree” to “strongly disagree” with a “neutral”. A panel of 10 expert nurses established content validity. The SDS has a reported Cronbach’s alpha of 0.92 for simulation design features and 0.96 for the importance of the features (Chickering & Gamson, 1987; Jeffries & Rizzolo, 2006).

Educational Practices in Simulation Scale (EPSS)

The EPSS is a 16-item instrument to measure the presence of the four educational practices in an instructor-developed simulation scenario: active learning, collaboration, diverse ways of learning, and high expectations in the instructor-developed simulation, and the importance of each practice to the learner. Responses range from "strongly agree" to "strongly disagree" with a "neutral" option. Chickering and Gamson (1987) provided the foundation for the educational practices. The EPSS has a reported Cronbach's alpha for the educational practices of 0.86 and importance of the practices of 0.91 (Jeffries & Rogers, 2007).

Student Satisfaction and Self-Confidence in Learning

The Student Satisfaction and Self-Confidence in Learning is a 13-item instrument to rate participants' satisfaction with the simulation experience and their level of self-confidence gained through the simulation experience. Responses range from "strongly agree" to "strongly disagree" with a "neutral" option. The Student Satisfaction and Self-Confidence in Learning Scale has a reported Cronbach's alpha of 0.94 for the satisfaction and 0.87 for self-confidence. A panel of 10 expert nurses established content validity (Jeffries & Rizzolo, 2006).

Simulation Studies Using the NLN Simulation Tools

Cantrell, Meakim and Cash (2008) conducted a study to evaluate a pediatric-based simulation as an effective teaching-learning experience using the SDS, EPSS, and the Student Satisfaction and Self-Confidence in Learning questionnaire. The mean scores were: SDS 3.6/5.0, EPSS 3.6/5.0, and Student Satisfaction and Self-Confidence in Learning 3.8/5.0. Students perceived the higher levels of fidelity were more effective. Both facilitation and debriefing were key components of the simulation.

Hoadley (2009) conducted an experimental, two group design, to compare Advanced Cardiac Life Support (ACLS) training for critical care nurses. The experimental group used high-fidelity simulation and the control group used low-fidelity simulation. The study revealed no statistically significant difference on the post-test and the pre-test revealed no significant prior ACLS knowledge for either group. Inter-rater reliability for skills score ranged from 0.94 to 1.00. There was no statistical significance in the two groups' skills scores. Both groups were satisfied with their level of fidelity experience using the Simulation Design Scale (SDS) (Jeffries & Rogers, 2007) with no statistical significant difference. However, the experimental group had significantly higher satisfaction and self-confidence scores than the control group, but not statistically significant. This study calls for further research comparing high- and low-fidelity to determine if there is a difference in experiences that offset the cost of high-fidelity.

Butler, Veltre and Brady (2009) conducted a pilot study utilizing the NLN/JSF to compare active learning pedagogy using low- and high-fidelity simulators in a pediatrics scenario focusing on fluid and electrolytes. Thirty-one junior college nursing students were the participants in this two group randomized study. The SDS (Jeffries & Rogers, 2007), a valid and reliable tool, was the evaluation tool for this study. The research question looked at students' perception of active learning strategies for low- and high-fidelity simulation. Both groups stated they valued the active learning with simulation. The high-fidelity group perceived a higher resemblance to reality and better problem solving than the low-fidelity group. This study supported the use of simulation in pediatric nursing.

Arnold and colleagues (2013) conducted an experiment designed to compare three simulation-based teaching methodologies on the outcomes of emergency response knowledge, confidence, satisfaction and self-confidence with learning, and performance. The Emergency

Response Performance Tool (ERPT) developed by the research team, and the Student Satisfaction and Self-Confidence in Learning instrument (Jeffries & Rogers, 2007), were used for pre- and post-test written examinations. Confidence questionnaires, baseline and post-test performance assessments designed by the research team, were also obtained in the study for evaluating nurses (n=28) after completing critical care orientation. The simulation methodologies used were low-fidelity, computer-based, and high-fidelity simulation. The results showed no statistical differences among the three modalities for emergency response knowledge, confidence, or performance. However, there were significant differences in satisfaction and self-confidence in the Student Satisfaction and Self-Confidence in Learning instrument (Jeffries & Rogers, 2007) with a preference for high-fidelity simulation. These authors recommend further research with larger sample sizes.

Wang, Fitzpatrick and Petrini (2013) studied the differences in outcomes related to use of medium-fidelity compared to high-fidelity simulations among Chinese nursing students. This study was a comparative, quasi-experimental design of junior nursing baccalaureate students (n=59). Three instruments were used to evaluate the outcomes: Student Satisfaction and Self-Confidence in Learning instrument, the Simulation Design Scale (SDS) and the Educational Practices in Simulation Scale (EPSS) (Jeffries & Rogers, 2007). The authors determined both simulation modalities were beneficial. The medium-level fidelity simulations were rated significantly higher in students' satisfaction and self-confidence. However, high-fidelity simulation scored higher in the total score of SDS and objectives and information. The authors suggest more research is needed.

Tosterud, Hedelin, and Hall-Lord (2013) conducted a quantitative, evaluative and comparative design study with baccalaureate nursing students in Norway (n= 86) to measure

levels of fidelity in simulation and students' perception of learning depending on their level in the curriculum (year one [n = 22], year two [n= 19], and year three [n= 45]). At each level in their curriculum, the randomly assigned groups of students completed one of the following: a simulation experience using high-fidelity manikins (n= 30), a simulation experience using low-fidelity (static) manikins (n= 28), and a written case study simulation (n= 28). These three levels of simulations were adapted to the appropriate level in the curriculum. Permission was obtained from NLN to translate and use the Student Satisfaction and Self-Confidence in Learning Scale, the Educational Practices in Simulation Scale (EPSS), and the Simulation Design Scale (SDS) (Jeffries & Rogers, 2007). These tools are valid and reliable with Cronbach's alphas >0.86 (Jeffries & Rogers, 2007). Sample sizes were small for each group with a range from six to 15. The results of the study concluded students' perception of learning occurred in all levels of fidelity and all levels can be used effectively in nursing education. Differences were noted in active learning and collaboration, but no statistical significance was measured. There were no differences in students' perception based on their level in the curriculum. The students with the highest level of satisfaction were the group with written case studies. The researchers suggest more research is needed determine the rationale behind students' perception of simulation methods.

Research Comparing Fidelity Using the Clinical Learning Environment Comparison Survey (CLECS)

Gore, Leighton, Sanderson, and Wang (2014) conducted a quasi-experimental study to explore students' perception of how well their learning needs were met by (a) comparing high- versus low-fidelity simulation groups within simulated and traditional clinical environments, and (b) comparing simulated versus traditional clinical environments based on high- and low-fidelity

groups. A convenience sample of nursing students (n=70) enrolled in the fundamental/ assessment course and laboratories during the first clinical semester of a five-semester program was used. After the simulation and traditional clinical experiences were completed, participants completed the Clinical Learning Environment Comparison Survey (CLECS) (Leighton, 2007). The CLECS is a 29-item side-by-side comparison of students' perceived learning needs in the traditional clinical environment and the simulated clinical environment. The instrument provided a sum score for perceived learning along with six subscales: communication, nursing process, holism, critical thinking, self-efficacy, and teaching-learning dyad (Leighton, 2007). The CLECS reported Cronbach's alphas for the subscales in the traditional clinical environment from 0.741 to 0.877 and in the simulated clinical environment from 0.826 to 0.913. Participants in the high-fidelity group perceived their learning needs were better met as compared with the low-fidelity group ($p= 0.015$). Fidelity of the mock hospital unit simulation as the initial clinical experience did impact the student's perception of how well their learning needs were met. Students perceived high-fidelity simulation as an equal to traditional clinical experience in meeting their learning needs ($p= 0.270$). However, students perceived the low-fidelity simulation as inferior to traditional clinical experience ($p= 0.003$).

The NCSBN National Simulation Study

The National Council of State Boards of Nursing (NCSBN) conducted a national study to evaluate the amount and types of simulation that obtain better student outcomes (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). The purpose of this study was to highlight best practices in simulation use, evaluate the learning occurring with various amounts of simulation substituting for clinical hours, establish key simulation standards and learning

experiences in each core clinical course, and evaluate new graduates' ability to translate simulation experiences into the workplace.

The study consisted of three parts: phase one was a simulation survey sent to all schools of nursing in the United States; phase two was a randomized, controlled, multi-site, longitudinal study of three levels of simulation used in lieu of clinical hours (10% simulation control group, 25% simulation group, and 50% simulation group); and phase three was the evaluation of translational outcomes into the workforce and passing the National Council Licensure Examination (NCLEX). The follow-up component evaluated the participants into their first year of practice to measure retention and clinical judgment.

Phase One of the NCSBN was a national survey mailed to all schools of nursing in the United States of America. These results yielded that 77% of all responding nursing schools (62% response rate) in the United States were substituting simulation in lieu of traditional clinical hours in a variety of core curriculum courses (Hayden, 2010). The results of Phase Two and Three were released in August 2014 (Hayden et al., 2014).

The study was a randomized, controlled, large-scale, multi-site, longitudinal design with a follow-up component. There were 666 students that completed the study. The demographics for the participants that completed the study are provided in Table 1. The mean age of the group that completed the study was 26.1 (SD 7.5).

Table 1

Demographics of Participants that Completed the NCSBN Study

		Number	Percentage
Gender			
	Female	570	87.3%
	Male	83	12.7%
Race			
	White	566	86.5%
	Black/African American	48	7.3%
	Asian	39	6.0%
	Native American/Alaska Native	7	1.1%
	Hawaiian/ Pacific Islander	4	0.6%
Ethnicity			
	Hispanic	121	18.5%
Experience as a Certified Nursing Assistant		98	14.9%
Previous Degree		426	64.8%
	Associates Degree	83	12.6%
	Baccalaureate or Higher	148	22.5%
Military Experience		21	3.2%
	Medical Corp	4	0.6%
	Reservist	1	0.2%

Hayden and colleagues (2014) used several tools for evaluation of the longitudinal, randomized, controlled study for replacing clinical hours with simulation in pre-licensure nursing education. One of the tools used was the Clinical Learning Environments Comparison Survey (CLECS) (Leighton, 2007) for student perceived learning effectiveness at the end of each clinical course and the completion of curriculum for each group for simulation as clinical time: the control group used 10% simulation control group (n = 197 traditional; n = 174 simulation), 25 % simulation (n = 202) and 50% simulation (n = 187). Hayden and colleagues' results using the

CLECS tool revealed that students in the control group (10% simulation) preferred traditional clinical experiences and the 50% simulation group preferred the simulated clinical experiences. The 25% simulation group was in the middle with a tendency for preferring traditional clinical experiences. This study also evaluated student outcomes for NCLEX pass rate and a six-month follow-up after graduation. No statistical differences were noted between the groups (Hayden, 2014).

Other tools/instruments used in this study were the Creighton Competency Evaluation Instrument (CCEI) (Todd, Manz, Hawkins, Parsons, & Hercinger, 2008) for clinical competency; Assessment Technologies Institute (ATI) (https://www.atitesting.com/Home.aspx) for knowledge; the New Graduate Nurse Performance Survey (NGNPS) (Berkow, Virkstis, Stewart, & Conway, 2008) for assessing clinical knowledge, technical skills, critical thinking, communication, professionalism, and management of responsibilities; and NCLEX passage for licensure, and the Critical Thinking Diagnostic (Hayden et al, 2014).

The NCSBN study was conducted across the curriculum: fundamentals, medical-surgical nursing I, medical-surgical nursing II, maternal-newborn, pediatrics, and community nursing courses were included in this study. There was not a transition into professional practice or leadership course evaluated in this study. The ATI predictor score provided each participant taking the examination with a percentage score of the likelihood of passing the NCLEX for licensure. The ATI predictor scores for some of the courses had statistically significant values. The ATI predictor scores for the sum total for all participants (n = 641) was 69.6 (SD 8.2). The 10% simulation control group (n = 209) was 69.1 (SD 8.7). The 25 % simulation group (n = 221) was 69.5 (SD 8.6). The 50% simulation group (n = 211) was 70.1 (SD 7.1). Comparison

of groups on the ATI predictor scores yielded no statistical differences (p = 0.478) (Hayden et al., 2014)

The fundamentals ATI predictor scores revealed no statistically significant findings in total scores. The ATI adult health I and adult health II is a combined examination and the total score for this examination revealed statistically significant differences (p = 0.005) with students in the 50% simulation group scoring a higher mean than the 10% simulation control group. For maternal-newborn, the ATI predictor scores revealed a statistically significant difference (p = 0.011) with the students in the 50% simulation group scoring a higher mean than the 10% simulation control group. The ATI predictor scores for pediatrics total score revealed a statistically significant difference (p = 0.002) with the students in the 50% simulation scoring a higher mean than the students in the control group with 10% simulation control group. The ATI predictor scores for mental health total score revealed a statistically significant difference (p = 0.011) with the students in the 50% simulation group scoring a higher mean than 10% simulation control group. The ATI predictor scores for community total score revealed no statistical differences in the means scores between all groups. There were no ATI predictor scores or results noted for a leadership course in this study (Hayden et al, 2014).

The end-of-program survey completed by the new graduate nurses' preceptors ratings yielded no statistical differences in performance (scale of 1-6), critical thinking diagnostics (scale of 1-6), global assessment of clinical competency and readiness for practice (scale of 1-10). There were no statistical differences in any of the categories and subscales between groups: performance (p = 0.432 – 0.849), critical thinking diagnostics (p = 0.318 – 0.494) and global assessment of clinical competency and readiness for practice (p = 0.688). This same survey was given to the participants to complete. The study participants perceived their critical thinking

diagnostic skills highest for the 50% simulation group over the 25% simulation group in clinical decision making ($p = 0.011$), prioritization ($p = 0.029$), and clinical implementation ($p = 0.043$). The 50% simulation group rated their scores higher than the 10% simulation control group for reflection ($p = 0.014$). The 50% simulation group rated their global assessment of clinical competency and readiness for practice higher than the 25 % simulation group and the 10% simulation control group ($p = 0.001$) (Hayden et al., 2014).

The results of the NCSBN study (Hayden et al., 2014) concluded that up to 50% of traditional clinical experiences can be substituted with simulation across all pre-licensure nursing clinical courses for all types of programs in the United States since there were no statistical differences between the NCLEX pass rates among study groups. All three groups, regardless of the percentage of simulation experiences used, were equally prepared to practice as new graduate nurses. Furthermore, the authors recommended that policy decision for simulation use in nursing should be based on utilization of best practices in simulation that was identified by this study. The NCSBN study stated the results of this study were achieved by incorporating the *INACSL Standards of Best Practice: Simulation*, high quality simulations, debriefing methods grounded in educational theory, and trained, dedicated simulation faculty (Hayden et al., 2014). These study results may impact the future preparation of all nursing students.

The INACSL *Standards of Best Practice: Simulation*

INACSL is a professional organization that has a mission to promote research and disseminate evidence based practice standards for clinical simulation methodologies and learning environments. The vision is to be nursing's portal to the world of clinical simulation pedagogy and learning environments. INACSL revised their *Standards of Best Practice: Simulation* in 2013. The standards include: Standard I - Terminology, Standard II - Professional Integrity of

Participants, Standard III - Participant Objectives, Standard IV - Facilitation, Standard V - Facilitator, Standard VI - The Debriefing Process, and Standard VII - Participant Assessment and Evaluation. The standards were developed after an extensive needs assessment of the INACSL membership for the development of standards for simulation. The purpose of the analysis was to determine the priority and ranking of the INACSL membership for the standards. Top priorities were established as standards and the lower priorities are under development as guidelines (Howard, Leighton, & Gore, 2014, pg. 460).

Standard I - Terminology states "Consistent terminology provides guidance and clear communication and reflects shared values in simulation experiences, research, and publication. Knowledge and ideas are clearly communicated with consistent terminology to advance the science of simulation." (Meakim et al., 2013, pg. S3). The terminology and definitions were developed based on a review of literature.

Standard II - Professional Integrity of Participants states "The simulation learning, assessment, and evaluation environments will be areas where mutual respect among participants and facilitator(s) is expected and supported. As such, it is essential to provide clear expectations for the attitudes and behaviors of simulation participants. Professional integrity related to confidentiality of the performances, scenario content, and participant experience is required during and after the simulation. Confidentiality is expected in live, recorded, or virtual simulation experiences." (Gloe et al., 2013, pg. S12-S13).

Standard III - Participant Objectives states "All simulation-based learning experiences begin with the development of clearly written participant objectives, which are available prior to the experience. Participant objectives are the guiding tools of simulation. Objectives are essential to determine if the outcomes for simulation-based learning experiences have been

achieved. To meet participant objectives, identification of appropriate scenario, fidelity, and facilitation is crucial." (Lioce et al, 2013, pg. S15).

Standard IV - Facilitation states "Multiple methods of facilitation are available, and use of a specific method is dependent on the learning needs of the participant(s) and the expected outcomes. Facilitation methods should vary, keeping in mind that participants bring cultural and individual differences that affect their knowledge, skills, attitudes, and behaviors. Facilitation assists participants in meeting the objectives by incorporating their needs and experience level into the planning and implementation of a simulation-based learning experience. Facilitators use feedback or debriefing to help participants meet the objectives and expected outcomes. Facilitation should be appropriate to the participants' level of learning and experience, and be theoretically based using best practices." (Franklin et al, 2013, pg. S19).

Standard V - Facilitator states "A proficient facilitator is required to manage the complexity of all aspects of simulation. The facilitator has specific simulation education provided by formal coursework, continuing education offerings, and targeted work with an experienced mentor. The facilitator is key to participants' learning. The facilitator guides and supports participants to understand and achieve the objectives. The facilitator helps the participants explore the case and their thought processes used in decision making. In addition, the facilitator engages the participants in searching for evidence-based practice solutions to foster skill development, clinical judgment, and reasoning. The facilitator adjusts the simulation to meet the learning objectives based on the participants' actions or lack of actions. The facilitator leads the participants in identifying the positive action, the actions that could have been changed to promote better patient outcomes, and how the actions could have been changed to meet the learning objectives, if these objectives have not been met." (Boese et al, 2013, pg. S22-S23).

Standard VI - The Debriefing Process states “All simulation-based learning experiences should include a planned debriefing session aimed toward promoting reflective thinking. Learning is dependent on the integration of experience and reflection. Reflection is the conscious consideration of the meaning and implication of an action, which includes the assimilation of knowledge, skills, and attitudes with pre-existing knowledge. Reflection can lead to new interpretations by the learner. Reflective thinking does not happen automatically, but it can be taught: it requires time, active involvement in a realistic experience, and guidance by an effective facilitator. The skills of the debriefer are important to ensure the best possible learning; learning without guidance could lead the learner to negatively transfer a mistake into their practice without realizing it had been poor practice, repeat mistakes, focus only on the negative, or develop fixations. Research provides evidence that the debriefing process is the most important component of a simulation-based learning experience.” (Decker et al, 2013, pg. S26-S27).

Standard VII - Participant Assessment and Evaluation states “In a simulation-based experience, formative assessment or summative evaluation can be used. Formative assessment fosters personal and professional development and helps participants progress toward achieving objectives. The use of simulation supports assessment or evaluation of behaviors demonstrated in the domains of learning: cognitive (knowledge), affective (attitude), and psychomotor (skills).” (Sando et al., 2013, pg. S30).

According to Hayden et al. (2014), effective simulation and learning can be obtained by incorporating these standards. All simulation experiences should be designed with clearly identified objectives. Based on the identified objectives, the simulation designer must select the appropriate level of fidelity, facilitation, and simulation scenario. However, empirical studies

supporting the objectives of the simulation experience are lacking (Groom, Henderson, & Sittner, 2014).

There is a dearth of research evaluating the effectiveness of simulation compared to traditional inpatient hospital clinical experience. There is also limited evidence comparing students' perceived learning effectiveness using different levels of manikin fidelity following both the simulated clinical experience and actual human patient care within a clinical experience setting. This is especially true for low-fidelity simulations. With the lack of empirical studies and inconsistent results in existing research, educators need to conduct further research on simulation as a learning strategy to meet the learning needs of nursing students.

Theory and Conceptual Framework

National League for Nursing-Jeffries Simulation Framework (NLN/JSF)

In 2005, Jeffries introduced the NLN/JSF that described the constructs to be the design core for simulation. The NLN/JSF provides educators an organizing framework to control the variables of the experience to assist with determining the effectiveness and influences of simulation. There are five components in the NLN/JSF framework. These components are teacher (facilitator), student (participant), educational practices, outcomes, and simulation design characteristics. In 2010, a research team of simulation research experts was assembled to review the constructs of the NLN/JSF. Two major recommendations were identified and the framework was adapted. These changes are from teacher to facilitator (Jones, Reese, & Shelton, 2014; Jeffries & Rogers, 2012) and student to participant (Durham, Cato, & Lasater, 2014; Jeffries & Rogers, 2012).

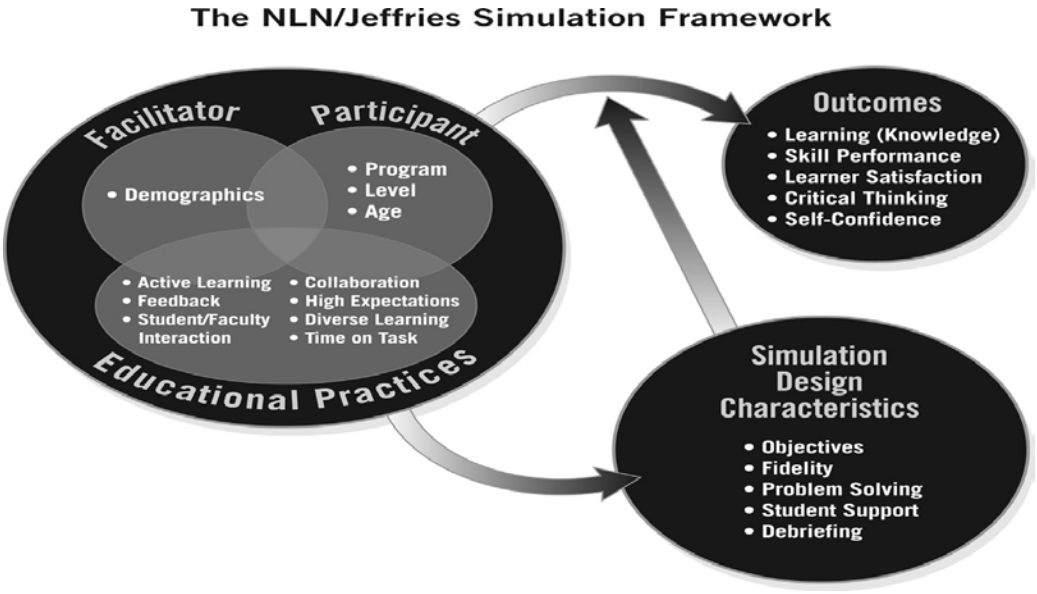

Figure 1. *The National League for Nursing-Jeffries Simulation Framework (NLN/JSF)*

From *Simulation in Nursing Education: From Conceptualization to Evaluation* (2nd ed)(p. 37), edited by P.R. Jeffries, 2012, New York: National League for Nursing. Reproduced with permission (Appendix A).

Facilitator. The first component is the facilitator. A facilitator is mandatory for a successful experience. The facilitator guides the experience, provides support to the participants, offers useful feedback and critiques to participants, and evaluates the performance. It is the facilitator's responsibility to guide the participants in reflection on performance and making links between theory and application into practice. The facilitator should be knowledgeable in the topic/content of the simulation he/she is facilitating. During facilitation, the facilitator should consider the demographics of the participants as they guide the experience. The demographics include, but are not limited to, age, gender, culture/ethnicity, language, type of learner and program using the simulation experience (Jones et al., 2014; Jeffries & Rogers, 2012).

In a review of literature, inconsistencies were found for the experience and competencies required of the facilitator and evaluation of the facilitator. Billings and Halstead (2012) stated

the facilitator should possess (1) a foundation in experiential learning, (2) the aptitude for establishing clear learning objectives, (3) facilitation of learning experience, (4) establish adequate time for simulation experience, and (5) experience with learner-centered, not teacher-centered teaching (Jones et al, 2014).

Participant. The second component of the NLN/JSF is participant. This component, formerly known as student, is now referred to as participant because experienced health care professionals often participate in simulation (Durham, Cato, & Lasater, 2014; Jeffries & Rogers, 2012). The participant is involved in the simulation experience through active participation or as an observer of the simulation. Research demonstrates learning occurs in both experiences. The facilitator should consider the type of program and level in that program for the participants, along with the age of the participants. Millennial learners have preference for experiences that are interactive and use teamwork (McCurry & Martins, 2010). These are important aspects to be considered during the development of a simulation experience.

Educational Practices. The educational practices identified in the NLN/JSF are (1) active learning, (2) feedback, (3) diverse learning styles, (4) participant-facilitator interaction, and (5) high expectations (Jeffries & Rogers, 2012). During the expert panel review of this framework, additional practices were identified: collaboration and time on task (Hallmark, Thomas, & Gantt, 2014). Active learning encompasses active engagement in the learning experience. The learner must be engaged to maintain focus and improve critical thinking skills. Through active engagement, the facilitator has the opportunity to observe the participants' problem-solving and critical thinking ability, along with psychomotor skill performance in some experiences. Feedback is also linked to the facilitator component. The facilitator must establish

the type, frequency, and timing of the feedback while maintaining a professional and safe environment for the participants (Hallmark et al., 2014; Jeffries & Rogers, 2012).

While designing the simulation experience the facilitator must consider the diversity of the participants. The simulation should include activities to meet different learning styles: auditory, tactile, visual, and kinesthetic. The facilitator will determine the degree to include each learning style based on the participants and the complexity of the simulation (Hallmark et al., 2014; Jeffries & Rogers, 2012).

The next component is the participant-facilitator feedback. The interaction between the participant and the facilitator establishes the tone or atmosphere of the simulation experience. Research has shown the relationship between the participant and facilitator can influence the simulation. A collaborative relationship fosters a positive impact. The collaboration is between participants for teamwork, and facilitator, to foster respect and openness to ask questions to augment learning. This feedback must occur during the simulation learning experience or immediately upon completion of the experience, depending on the type of facilitation to guide learning and improve patient care. Participants should also provide feedback on the simulation experience for improvement through revision of the scenario (Hallmark et al., 2014; Jeffries & Rogers, 2012).

The last component of educational practices is promoting high expectations. Both the participant and the facilitator should establish objectives to be obtained and collaboratively set goal(s) to meet or exceed these expectations. Participants are provided with simulation objectives and pre-simulation preparatory material. The participants must be involved in their own learning and prepare for the simulation experience in order to be successful (Hallmark et al., 2014; Jeffries & Rogers, 2012).

Simulation Design Characteristics. The simulation design characteristics for the NLN/JSF include: (1) objectives, (2) fidelity, (3) problem-solving, (4) participant support, and (5) debriefing (Groom, Henderson, & Sittner, 2014; Jeffries & Rogers 2012). Jeffries and Rogers (2007, 2012) state that well written objectives are essential when designing an effective simulation scenario. The objectives should be comprehensive and provide the specific details required for the students to meet the outcome goal of the simulation experience. These objectives must be congruent with the participant's level of knowledge and ability to perform the skills in order to meet the outcome goal. The level of fidelity chosen for the simulation should be appropriate to meet the learning objectives and outcome goal of the simulation.

The level of fidelity, or ability to replicate reality, should be selected and implemented based on the purpose or objective of the simulation. The level of fidelity should not be determined solely on the equipment available (Jeffries & Rogers, 2012). There is a lack of empirical evidence that better learning outcomes are achieved with high levels of fidelity (Groom et al., 2014).

Problem solving is the level of complexity required to achieve the goals or objectives of the simulation. The facilitator must examine the participant constructs in determining the level of problem solving required by the participants to meet or exceed expectations. The problem solving required for the simulation experienced should be based on the level of participants, the program of the participants, and the objectives of the simulation scenario (Groom et al., 2014; Jeffries & Rogers, 2012).

The next component of simulation design characteristics is participant support and cues. The level of support should be determined during the development of the simulation. The facilitator needs to establish the amount and frequency of support. This support may be offered

as a cue in the form of lab data, simulated patient script, or an embedded actor(s) in the scenario. Scripts should be provided when possible to provide consistency of data provided to participants (Groom et al., 2014; Jeffries & Rogers, 2012).

The last component of simulation design characteristics is debriefing/reflective thinking. Reflective thinking sessions following a simulation with a debriefing session, is viewed by many experts as a major component of simulation. During these sessions participants are guided by the facilitator to link performance and patient responses to view the entire situation, not just segments of the situation. The reflective thinking session is not an additional lecture session for the teacher to lecture. This is a time for participants to reflect on their performance and develop the skill of reflective thinking (Groom et al., 2014; Jeffries & Rogers, 2012).

Outcomes. Outcomes are the last component of the NLN/JSF. There are five subcomponents for outcomes: (1) learning, (2) skill performance, (3) learner satisfaction, (4) critical thinking, and (5) self-confidence. As with the objectives and learning outcomes, the method and tool(s) to measure the objectives should be determined during the development of the simulation. The simulation scenario should be evaluated to determine what the participants learned and the effectiveness of the scenario (Jeffries & Rogers, 2012; O'Donnell et al., 2014).

Learning refers to evaluating knowledge through testing. Skill performance is a measurable outcome for technical and non-technical skills. Learner satisfaction is the level of satisfaction that is self-reported by not only the participants, but includes the facilitators. Studies suggest both participants and facilitators have high levels of satisfaction with simulation as a teaching and learning strategy (O'Donnell et al., 2014). Critical thinking is an organized thinking process based on evaluation of data not just speculations (O'Donnell et al, 2014). The last subcomponent for outcomes is self-confidence. Lyle (2009) states health care providers are

less likely to respond appropriately in a timely manner if they lack self-confidence. There are valid and reliable tools available to have participants evaluate their self-confidence/self-efficacy after simulation. Simulation is a strategy used to provide participants with an opportunity to practice and build self-confidence (Jeffries & Rogers, 2012; O'Donnell et al., 2014).

The NLN/JSF was selected for this study because it depicts a correlation that the simulation design characteristics should be based on the participants' ability to meet the learning objectives and outcome goal along with the fidelity required to obtain those objectives. Two of the simulation design components are objectives and fidelity. The research questions for this study look at the comparison of the fidelity of the simulation and the specific objectives of the simulation on student perceived learning effectiveness.

Kolb's Experiential Learning Theory (ELT)

Kolb (1984) developed the Experiential Learning Theory (ELT). Kolb defines the process of learning as an interactive relationship between the learner and the environment. The major components of ELT are participation in a concrete experience, reflective observation of the concrete experience, abstract conceptualization by learning and looking for identifiable patterns from the concrete experience, and active experimentation by applying what has been learned (Decker, Cabellero, McClanahan, 2014).

Kolb's ELT has been used in research extensively in nursing studies for learning styles. Multiple learning styles and areas of nursing research have been explored for associations between the nursing students' learning styles and preferences, decision-making skills, educational preparation, nursing roles, nursing specialty, factors influencing career choices, and diagnostic abilities. The major learning style for nursing students and nurses, according to Kolb, is the concrete learning style (Laschinger, 1990).

Simulation based learning is an experiential learning opportunity that provides the concrete experience in the scenario for participants. For learning to occur, the didactic knowledge must be applied into the clinical setting. Simulation allows the participant a chance to experience an abstract concept or information in a concrete experience. The reflective observation of the concrete experience occurs in the debriefing session following the simulation. Through this reflection, participants can develop their own abstract concepts for linking actions and outcomes to patient care. These abstract concepts then can lead the participants to use active experimentation. During active experimentation participants can implement the concepts into clinical practice or application to patient care. Not every participant will go through the stages at the same rate. These stages are not set. Participants can go between the stages until the abstract concepts are practiced and the participants assess the best strategies for better patient outcomes (Decker et al., 2014; Kolb, 1984).

For the information to be transferred into clinical practice, the health care provider must have an initial experience to learn and then be allowed to reflect on the experience. In simulation this reflection is usually incorporated into the debriefing. In traditional clinical experiences, this reflection is usually incorporated into the post-clinical conference. The facilitator or clinical instructor guides this reflection to assist participants in making the appropriate connections between assessment findings, interventions, and outcomes. After reflection, the student can conceptualize the practice and draw conclusions about the practice. This leads participants to experiment or apply behaviors into the practice. Nursing is a practice discipline with learning occurring in a variety of settings, including simulation scenarios and traditional hospital clinical experiences. Through repetitive practice, the student can practice the skill until the practice is formed.

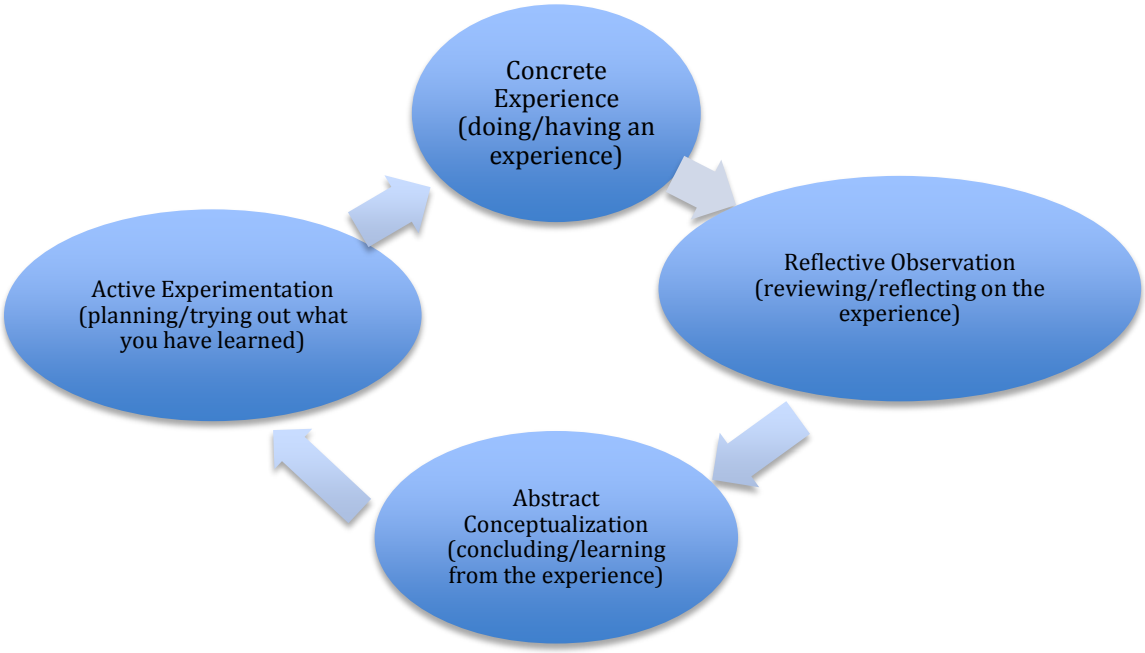

Figure 2. *Kolb's Cycle of Experiential Learning*

Kolb's Experiential Learning Theory Application to Simulation in Nursing

Taking the Patient to the Classroom by Applying Kolb's ELT. Waldner and Olson (2007) applied Kolb's ELT and Benner's nursing skill acquisition theory (novice to expert) to simulated learning experiences for nursing students. The education of nursing students is facing many obstacles as a practice discipline. Some of the obstacles are limited access to practice opportunities with patients, shorter lengths of stay for patients, increasing numbers of nursing students competing for limited clinical sites, higher patient acuity that may heighten patient safety concerns, higher rates of nursing faculty and nursing staff shortages that may limit the acceptance of nursing students in the traditional clinical environment. There have also been ethical issues raised of when students are ready to practice on human patients considering patient safety. In the traditional clinical setting, nursing students' learning cannot be standardized. The learning experience is dependent on the patients admitted to the unit and their needs during the

shift worked by the students. However, with simulation, each student can be provided the same learning opportunity, which can standardize the students' learning. The simulated learning experiences can be accomplished using varying levels of simulation from low- to high-fidelity simulations.

Waldner & Olson (2007) used Benner's Model of Novice to Expert to provide a foundation of expectations for the levels of competency for nurses. These levels are novice, advanced beginner, competent, proficient, and expert. Novice nurses are detail-oriented on objective and measurable data that can be linked to theory learned in didactic lectures. The advanced beginner can link assessment findings associated with specific disease processes and start prioritizing the needs based on guidelines. The competent nurse begins to link actions and outcomes to see the bigger picture of the patient. The proficient nurse is able to perform as noted above, and detect changes in the patient's condition and respond accordingly. The expert nurse uses intuition that builds on knowledge and experience that targets the problem in a rapid order without having to objectively consider all the possibilities.

Many in the health care environment expect nursing students to graduate and enter the workforce at the advanced beginner level or possibly, even at the competent level. One strategy to provide the cognitive foundation of the learning process for nursing students is to advance higher in the levels of competency through Kolb's ELT. Waldner & Olson (2007) suggest simulation strategies can be used for each level of learning. For novice, the simulation should be "simple and straightforward so that attention can be given to details of the situation". (pg. 8). This needs to be associated with an opportunity to discuss their findings with faculty and reflect on experience.

Simulation for the advanced beginner should begin using protocols to guide the action of the nursing students. The simulations can require the student to implement actions based on a protocol, and "can be interrupted to discuss assessments and decisions on the spot, or debriefing can occur afterwards" (Waldner & Olson, 2007, pg.8). The competent nurse simulation uses the implementation of patient protocols and allows the students to assess whether the protocol is appropriate for the patient or are additional orders/changes required for the specific patient. The participants may not function as well with interruptions and verbal discussions during the simulation since it may be perceived as disruptive. The discussions and reflections are better accomplished during the debriefing session. The authors only provided examples of the levels of competency that can be accomplished with new graduates (Waldner & Olson, 2007).

Integration of Theory and Practice: ELT and Nursing Education. Nursing faculty need to explore teaching strategies to improve critical thinking for nursing students. Traditional didactic material through lectures along with student memorization of information and return demonstrations of nursing skills are no longer perceived as effective in improving or teaching critical thinking. Nursing is a practice discipline and is best learned through experiential learning. Kolb's ELT may provide nurse educators with a foundation to improve critical thinking through concrete experiences in simulation for baccalaureate nursing students. Kolb's ELT provides a methodological approach for transforming an experience for learning to occur (Lisko & O'Dell, 2010).

Lisko and O'Dell (2010) revised the curriculum of a medical-surgical I course to integrate simulated critical thinking experiences, and psychomotor skills development and practice. These researchers incorporated an end-of-semester simulation for each student enrolled in the course. All faculty members involved in the course received additional education and

training to implement the active teaching strategy. The scenario was conducted in the nursing laboratory. The simulation was a scheduled evaluation with their assigned clinical faculty from the traditional clinical experience. The participants were required to assess a patient problem, determine and implement appropriate nursing care along with a nursing skill. The faculty interacted with the participants to encourage critical thinking and reflection on practice.

The evaluation of the curricular change reflected it was a positive experience by the participants and faculty. The participants viewed the simulation as a way to apply the theory and didactic material with the psychomotor skills learned in the lab to improve critical thinking (Lisko & O'Dell, 2010).

Simulation across the Curriculum Using Kolb's ELT and NLN/JSF. Nurse educators are challenged to teach critical thinking and be able to help students to respond to the needs of patients who are more acutely ill without jeopardizing patient safety (Howard, Englert, Kameg, & Perozzi, 2011). Simulation is a teaching strategy that incorporates active learning. Simulation should occur across the curriculum to improve students' ability to critically think and have standardized experiences for all students. Simulation scenarios should have a theoretical underpinning for guiding simulation nursing research. Howard and colleagues (2010) conducted research for student and faculty perceptions for integrating simulation across the undergraduate curriculum for traditional and nontraditional baccalaureate nursing students. Traditional learners are most often millennial learners who want to learn through fun, interactive, teamwork that often uses technology. However, nontraditional students are often older students who use more adult learning theories, who want more practical, straight-forward experiences applicable for learning, and who want the instructor to bring real-life experiences with them in the learning

process. Therefore, faculty must address multiple learning needs for a diverse population. Simulation is a strategy for addressing different learning styles.

Howard et al. (2010) used Kolb's ELT as the theoretical approach for the learning experience to take an abstract concept in didactic courses and provide a concrete experience. The NLN/JSF (Jeffries & Rogers, 2007) was used as the framework for designing, implementing, and evaluating the simulation as a concrete experience. By applying a theory and a framework, educational knowledge for teaching and best practices for developing the simulation were incorporated as a guide to their research and student learning. The research design for this study was a mixed-method to evaluate the perceptions of students and faculty for each course simulation and help guide the decision if the simulations should continue in each of the courses. The courses for simulation were: health assessment, adult medical-surgical I, adult medical-surgical II, maternal-newborn, mental health, and transition to professional practice.

The results of this study (Hayden et al., 2014) revealed students in the last course of the curriculum, transition to professional practice, had higher mean scores for "simulation helped me understand the concepts", "was a valuable experience", "helped to stimulate critical thinking", "can substitute for clinical experience" and "should be included in undergraduate education" (Howard et al., 2010 pg. e8). The researchers concluded the higher mean might be a result of having simulation in every clinical course which resulted in more scaffolding of learning through the consecutive courses. Other data obtained supported that the students' experiences were positive and should be continued. Students did not perceive that simulation could totally replace traditional patient care, but should be used in conjunction with traditional patient care. The faculty believed the simulation experiences across the curriculum were beneficial for students,

but dedicated faculty, and additional training and time release were required for the simulation program to be effective.

Simulation-Based Interprofessional Education Guided by Kolb's ELT. Poore, Cullen and Schaar (2014) published a manuscript to provide a foundation and a process for using Kolb's ELT for interprofessional education (IPE) experiences using simulation for communication and collaboration. The major impetus for this study was the lack of communication and collaboration skills among different disciplines of health care professionals to work as a team for best patient outcomes. Communication errors are one of the major causes of patient safety issues and sentinel events for negative patient outcomes. The lack of teaching health care students to work together is because of the "silos" existing in education. New graduates from health care professions are not equipped to communicate effectively with other disciplines and may experience role confusion from disciplines that are different from their profession. IPE is the opportunity for multiple disciplines to engage with each other to improve communication and collaboration. One strategy to accomplish this is through interprofessional simulation experiences.

Interprofessional simulations offer participants an opportunity to actively engage with each other for a purposeful active learning experience to improve knowledge of different roles and professions, communication and collaboration with all members of the healthcare team. Communication problems have been identified as a key factor in patient errors or problems. Simulation provides an opportunity for IPE teams to learn how to communicate with other members of the team to improve patient safety. Kolb's ELT can provide a theoretical foundation for IPE simulation. Kolb's ELT is described as a cycle of learning with the stages listed and illustrated in figure 2. The simulation is the concrete experience and is followed by learner

reflection as a team of the concrete experience. Abstract conceptualization is the next stage for the participant to make connections between theory and the experience to formulate a plan of how to apply what has been learned for active experimentation. Active experimentation is the application of what has been learned in abstract conceptualization.

Poore et al. (2014, pg. e245) states six propositions of Kolb's ELT: "learning is a process; all learning is relearning; learning is a dialectic process (shifts between varying modes of reflection, action, feeling, and thinking); learning is holistic and integrative; learning results from interactions between person and environment; and learning is the process of creating knowledge". In the operationalization of Kolb's ELT and IPE simulation, an example of the concrete experience is the active experience for the IPE team to practice collaboration and communication. This is followed by the debriefing session for the reflective observation when the IPE team interacts with each other and learns how other members of the team interpreted their actions. This may enable the IPE team to explore ways to work together and perform at a higher level. Abstract conceptualization is the next stage when participants are able to take the information learned and develop new ideas to implement what was learned. The active experimentation is when the participants apply their plan. IPE is required to prepare new nurses to work as a vital member of the health care team. Simulation is an opportunity to allow IPE to work together in a safe, controlled environment to facilitate communication and collaboration for all members of the health care team.

Summary

This review has identified a need for further studies on simulation design components and a dearth of literature comparing students' perceived learning effectiveness in the simulation versus traditional clinical environments. The information obtained in this review of literature

was used to design a study to (1) compare the objectives of the simulation and the level of fidelity required to obtain the objectives for student perceived learning effectiveness, and (2) compare students' perceived learning effectiveness comparing the traditional clinical environment and the simulation environment. The NLN/JSF and Kolb's ELT provide the framework and theoretical bases for this study.

CHAPTER 3: METHODS

Purpose of the Study

The purpose of this study was to explore the relationship of students' perceived learning effectiveness of different levels of fidelity simulation based on the learning objectives and traditional clinical experiences based on the learning objectives. The relationship was also explored between students' perceived effectiveness of simulation and traditional clinical experiences.

Research Questions

Among baccalaureate nursing students at a single southeastern university and measuring perceived learning effectiveness using the Clinical Learning Environments Comparison Survey (CLECS) with the subscales of communication, nursing leadership, and teaching-learning dyad:

1. What is the relationship between first semester students' perceived learning effectiveness on communication and teaching-learning dyad for an initial inpatient care medium-fidelity manikin and mid-level environmental fidelity simulation, and traditional clinical experience?
2. What is the relationship between fifth semester students' perceived learning effectiveness on nursing leadership and teaching-learning dyad for a leadership multiple patient care low-fidelity manikin and mid-level environmental fidelity simulation, and leadership traditional clinical experience?

3. What is the relationship between students' perceived learning effectiveness on communication, nursing leadership, teaching-learning dyad, and sum total score in simulation, and traditional clinical experience?

Research Design

A descriptive correlational design was used for this study. This type of design examines the relationship between two or more variables without manipulation of a variable. A cross-sectional study was used to evaluate students' perceptions of learning effectiveness after the simulation experience and completion of the traditional clinical experiences during specific semesters. With the descriptive correlational design, a survey instrument is often used to obtain information about attitudes of a specific group (Huck, 2008). This research design was chosen in order to examine the relationship of the simulation design components of the NLN/JSF for objectives of simulation and fidelity of simulation (Jeffries & Rogers, 2012). The NLN/JSF provides a guide for the development of effective simulation development and learning experiences. This study incorporates the INACSL *Standards of Best Practice: Simulation* (2013) for developing and evaluating a simulation learning experience as recommended by Hayden et al. (2014) for best outcomes in simulation. The author of this dissertation modified a simulation template to incorporate the *Standards of Best Practice: Simulation* to guide simulation development at this school of nursing.

In this study, students were required to participate in both simulated clinical experiences and traditional clinical experiences. Upon completion of the simulation experiences and the traditional clinical experiences, students were asked to complete a survey - the Clinical Learning Environments Comparison Survey (CLECS) (Leighton, 2007). Results were analyzed to determine the relationships, if any, between the (1) simulation design characteristics of

objectives and fidelity on students' perceived learning perception, and (2) the simulation learning environment and traditional clinical environment on students' perceived learning for course specific objectives. The independent variable in this study was the level of fidelity of the simulation based on the objectives of the simulation and course. The dependent variables in this study were the students' perceived learning using the CLECS.

Setting

This study included students enrolled in either first semester fundamentals/assessment or fifth semester leadership/preceptorship nursing clinical courses at a public university in the rural southeastern United States. The Commission on Collegiate Nursing Education (CCNE) accredits this school of nursing. The first semester fundamentals/assessment course is four credit hours for didactic and three credit hours for clinical experiences. This includes 135 clinical hours total, with 60 hours in the skills laboratory and five hours of simulation lab hours. The fifth semester leadership courses are (1) three credit hours for didactic and two credit hours for clinical experiences, and (2) two credit hours didactic leadership course. The clinical course includes 90 hours of clinical experience with two hours of simulation. The simulation policy for this school of nursing states one hour of simulation is equal to three hours of traditional clinical experience due to the concentration of nursing events and learning in the controlled setting.

School of Nursing Simulation and Laboratory Spaces

This study was conducted after patient care experiences in the laboratory and simulation spaces located in the university school of nursing and traditional clinical experiences in area hospitals on medical-surgical units. The original nursing assessment lab is approximately 2,486 square feet divided into two areas. One side of the lab is primarily used as a skills lab, while the other side is a simulation lab. The skills lab has a "nurses' station" area and the perimeter of the

room is lined with eight hospital beds. Each bed area has a curtain for privacy, nightstand, overbed table, and non-functioning, but realistic, oxygen and suction wall unit above each bed. The center of the room has chairs for students with a portable computer and projector available.

The simulation lab has four beds around the room's perimeter similar to the skills lab. The simulation lab has a centrally located control room with clear views of all four beds behind a one-way glass window. Inside the control room are four stations for instructors to interact with simulation participants at each station and two large video screens that can be used for digital recordings of simulation.

A second lab space was constructed and opened in August 2013. This lab space is approximately 1,540 square feet. This space is configured for eight hospital bed areas as described previously in the skills lab area. The second lab has a seating area with 25 chairs, a demonstration/sink area for intravenous access and medications, a podium area with overhead projector, and a storage room.

The university school of nursing has a wide range of equipment to assist students in becoming professional nurses. These include: (a) high-fidelity manikins (4 total with 2 adults, 1 newborn, and 1 birthing manikin; (b) moderate-fidelity manikins (3 total with 2 adults and 1 child); low-fidelity manikins (15 total); task trainers for intravenous cannulation (IV), tracheostomy care, catheter insertion, and other psychomotor tasks; and portable electronic medication dispensing system.

Traditional Clinical Experiences

Traditional clinical experiences can occur at local and regional hospitals within 110 miles from the university and community clinical sites within the same region. For the first semester students, the traditional clinical experiences occur between the tenth through the fifteenth weeks

of the semester, after simulation as the initial clinical experience for students enrolled in the fundamentals/assessment course. The sites used for this study were limited to inpatient hospital units within 45 miles of the university. The clinical sites have contracts with the university for student learning opportunities. During the first semester, students care for one patient on an inpatient medical-surgical unit performing basic nursing skills and assessment for six 6-hour shifts. The clinical instructor for these students provides maximum supervision and facilitation. These students must also complete six community site clinical experiences.

During the fifth semester, students are enrolled in the leadership courses and provide care for two to four patients for four 12-hour shifts functioning as a registered nurse caring for a team of patients on an inpatient medical-surgical unit. During each of the 12-hour shifts, one student performs the role of charge nurse for three other student nurses and their team of patients. The clinical instructors work closely with the student charge nurse and the student charge nurse supervises their team of student nurses. The clinical instructor is available for all students. The staff nurses work closely with the student nurses to provide care for the team of patients. The hospitals used for traditional inpatient clinical experience are within a 45 mile radius of the university. Upon completion of the multiple patient simulation and traditional leadership clinical, students complete a 220-hour preceptorship clinical experience.

Sample

A convenience sample of 103 first semester junior baccalaureate nursing students enrolled in a required fundamentals/assessment clinical course and 155 fifth semester senior baccalaureate nursing students enrolled in a required leadership clinical course were used in this study. Both simulation and traditional clinical experiences were required clinical components of both of the clinical courses. However, only students who provided informed consent to use their

data evaluating the outcomes were included in the study. Data collection occurred over three semesters for each course to provide a larger sample size. The clinical groups were randomly assigned by drawing names for each clinical group for each course. Participation in simulation was scheduled from clinical groups in teams of two participants for first semester and individually for fifth semester.

Ethical Considerations

Expedited approval was obtained from the Institutional Review Board (IRB) of the university was submitted and obtained for this study to protect human subjects (Appendix B). Informed consent from the study participants was obtained and maintained by a faculty member not participating in the study or assigning grades for the courses (Appendix C). Students were notified that participation in the study was voluntary; however, they were required to participate in both clinical experiences as part of the curriculum requirements. Students were informed that the course leader would not receive the list of participating students or any personal identifiers that would identify them as participating in the study or not. The list of participating students remained in a locked file drawer in the consenting faculty member's office. The faculty member who obtained informed consent informed the students during the consent process that students' grades would not be affected if they chose to not participate in this study. This information was reinforced on the informed consent form.

Data Collection

First Semester Simulation and Traditional Clinical Experiences

First semester nursing students enrolled in the fundamentals/assessment course received nine weeks of didactic and laboratory skills lab practice prior to participating in the initial patient care simulation experience. The students participated in laboratory experiences three days a

week for one and a half hours each day for psychomotor skills, technical skills, and assessment skills. These students received information related to simulation in their syllabus and were oriented to the laboratory and simulation environments at the beginning of the semester as their initial laboratory experience. After the orientation to the laboratory and simulation environments, the students signed a Professional Integrity and Confidentiality Agreement (Appendix D).

The faculty course leader randomly assigned students into clinical groups of seven to eight per inpatient medical-surgical units. These clinical groups attended the inpatient medical-surgical unit with the same group and clinical instructor for the entire semester. Students were assigned in pairs to care for one of four patients in the simulation lab. Appendix E provides the template used for first semester student simulation as initial patient care and provides the simulation scenario that was developed by incorporating the *INACSL Standards of Best Practice: Simulation* (2013). These standards include objectives, pre- and post-simulation exercises and guidelines for the simulation, including debriefing questions for all four patients used in the simulation scenario. The objectives for the first semester simulation were: 1) understand the components and requirements of an inpatient clinical day; 2) utilize therapeutic communication; 3) identify and implement safety concerns depending on the patient; 4) recognize concerns and implement appropriate interventions; and 5) prioritize and implement nursing care to include documentation. Upon completion of the simulation experience, students completed 36 hours of inpatient traditional patient care and 36 hours of community patient experiences (Figure 3). Upon completion of all clinical experiences, students were emailed a link to complete the Clinical Learning Environments Comparison Survey (CLECS). The survey was entered into an online data collection program, Qualtrix™. The data obtained in Qualtrix™ was only identified

by the self-assigned identification number entered by students for anonymous data. The survey data was then converted to a Microsoft Excel™ spreadsheet and entered into Statistical Package for Social Sciences (SPSS) Version 22.

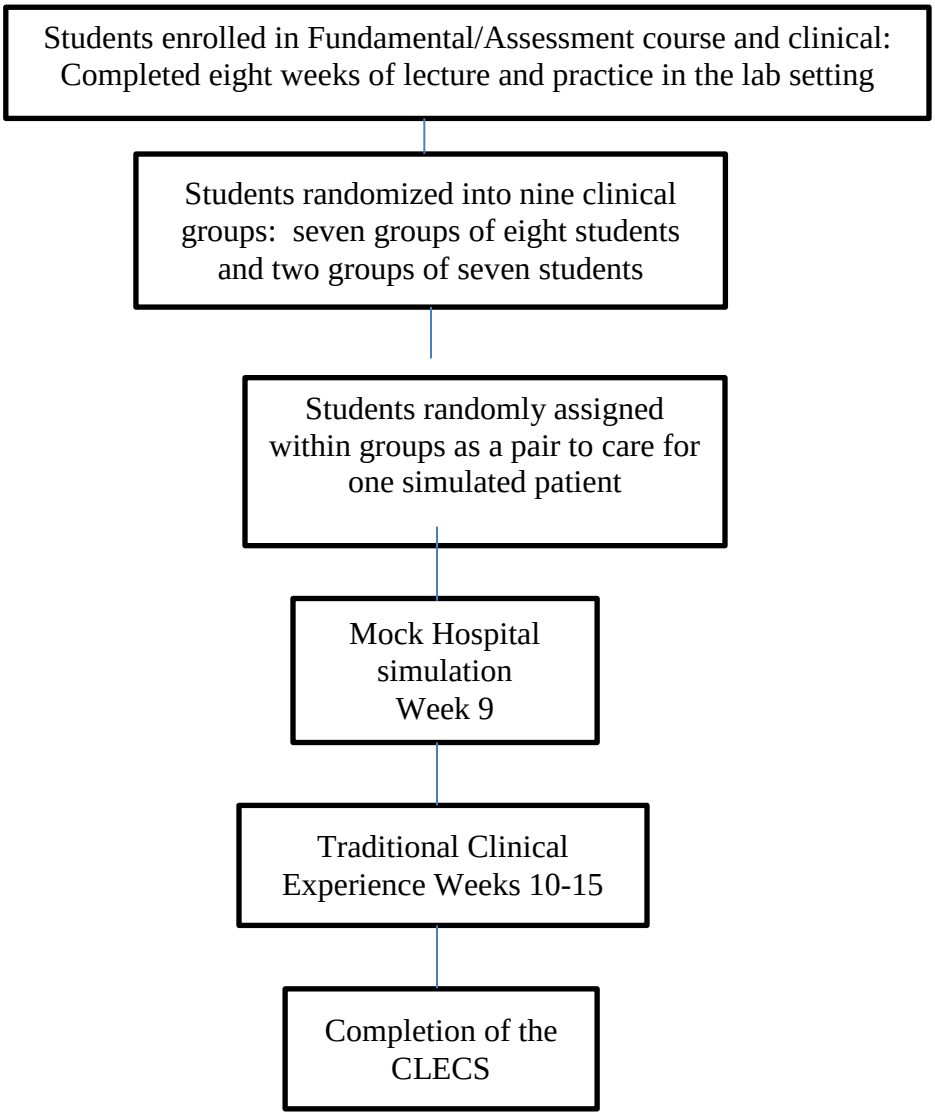

Figure 3. *Study Design for First-Semester Students*

Fifth Semester Simulation and Traditional Clinical Experiences

Fifth semester nursing students enrolled in a leadership course received one course of leadership during their fourth semester. During the fifth semester, the students are enrolled in

leadership and preceptorship clinical courses. During the first four weeks of the fifth semester, students were randomly assigned to a leadership clinical based on their clinical group during the medical-surgical II course. One half of the class was scheduled for leadership clinical for two weeks, a total of 48 hours, followed by participation in the leadership simulation. The other half of the class was scheduled for leadership simulation followed by two weeks of leadership clinical, a total of 48 hours (Figure 4). These students had participated in simulation experiences during each semester of nursing school and received information prior to the leadership simulation. The student information that was provided prior to the simulation for fifth semester students is located in Appendix F. The objectives of the simulation were: 1) communicate with team members and facilitators using SBAR, therapeutic, and closed loop communication; 2) provide safe quality care to a team of patients; 3) implement prioritization and delegation skills; 4) use and improve critical thinking skills; and 5) develop leadership skills.

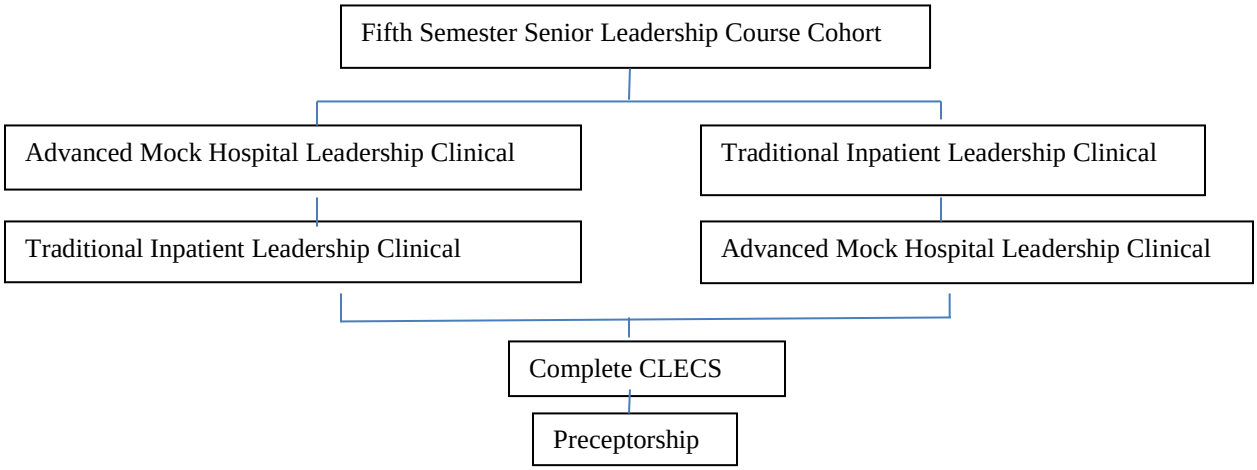

Figure 4: Study Design for Fifth-Semester Simulation

Students were assigned individually to care for four patients in the simulation lab. Appendix G provides the template used for fifth semester student simulation for leadership skills

using a multiple patient scenario. This identifies the development of the scenario incorporating the *INACSL Standards of Best Practice: Simulation* (2013), including objectives, pre- and post-simulation exercises and guidelines for the simulation, including debriefing questions in accordance with the template (Appendix G). Upon completion of all clinical experiences, students were emailed a link to complete the Clinical Learning Environments Comparison Survey (CLECS). The survey was entered into an online data collection program, Qualtrix™. The data obtained in Qualtrix™ was only identifiable by the self-assigned identification number entered by students for anonymous data. The survey data was then converted to a Microsoft Excel™ spreadsheet and entered into SPSS Version 22. Upon completion of these clinical experiences, students then completed 220 hours of preceptorship.

Instrument

Leighton (2007) developed the Clinical Learning Environment Comparison Survey (CLECS) based on pertinent topics from a literature review. The CLECS is a 29-item self-reported survey designed to compare the fulfillment of undergraduate nursing students' perceived learning needs met in the traditional versus simulated clinical environments. The responses for learning needs met were "4" if well met, to "1" if not met, and a "NA" if not applicable. A 12-member panel, composed of 11 clinical and simulation experts and one survey design researcher, evaluated the survey for content validity. The survey was piloted twice prior to administration for research. The first pilot was to 44 participants for feedback regarding clarity, wording, and difficulty. The second pilot was administered to 22 participants and completed twice, two weeks apart. Construct validity was established by conducting internal consistency via Cronbach's alpha (Table 2), Pearson's Correlation coefficient, and confirmatory factor analysis. Table 2 is the internal reliability of survey subscales from original pilot study to

original research study. Permission to use the CLECS was obtained from the researcher/developer of the tool for use in simulation research (Appendix H).

Pearson's Correlation coefficients were statistically significant (0.01 level) on a two-tailed t-test, ranging from r =.525 to .723. Confirmatory factor analysis was conducted of the traditional and simulated clinical environments on six subscales and questions: a) communication 1-4; b) nursing process 5-11; c) holism 12-17; d) critical thinking 18-20; e) self-efficacy 21-23 and 27; and f) teaching-learning dyad 24-26 and 28-29.

Table 2

Original Internal Reliability of CLECS Survey Subscales following Confirmatory Factor Analysis

Environment	Subscale	Cronbach's Alpha Pilot Study	Cronbach's Alpha Study	Cronbach's Alpha Post Factor Analysis
Traditional Clinical Environment	Self-Efficacy	.810	.831	.854
	Teaching-Learning Dyad	.796	.820	.855
	Holism	.890	.901	.898
	Communication	.574	.726	.741
	Nursing Process	.856	.847	.877
	Critical Thinking	.837	.881	.822
Simulated Clinical Environment	Self-Efficacy	.701	.857	.857
	Teaching-Learning Dyad	.729	.859	.891
	Holism	.892	.935	.913
	Communication	.437	.819	.826
	Nursing Process	.742	.865	.900
	Critical Thinking	.700	.889	.873

Data Analysis

Descriptive statistics were used for data analysis using the Statistical Package for Social Science (SPSS) Version 22.0. The CLECS was converted to an online survey using Qualtrix™. The CLECS instrument is provided in Appendix I. Responses from the CLECS were then exported to Microsoft Excel™ spreadsheet. The data from the spreadsheets was loaded into SPSS. Descriptive statistics were used to determine the age and ethnicity of the sample group along with previous healthcare experiences and time in the simulation lab. With factor analysis, the original subscales were combined and divided into three subscales: communication, nursing leadership and teaching-learning dyad.

After exploratory factor analysis with principal component extraction and an oblique rotation, three factors, Nursing Leadership (18 items), Communication (5 items), and Teaching-Learning Dyad (6 items), were obtained from the original 29-items in CLECS. These three factors accounted for 60.10% of the total variance. The reliabilities for each subscale ranged from .83 to .94, indicating the scores from CLECS were reliable. Table 3 lists the reliability information for each subscale.

Table 3

Reliabilities for Each Subscale in CLECS (Cronbach's Alpha)

CLECS Subscales	Traditional Clinical Environment	Simulated Clinical Environment
Nursing Leadership (18 items)	.933	.942
Communication (5 items)	.828	.898
Teaching-Learning Dyad (6 items)	.830	.862
Overall Scale	.923	.935

Descriptive statistics were used to answer research question one:

What is the relationship between first semester students' perceived learning effectiveness on communication and teaching-learning dyad for an initial inpatient care medium-fidelity manikin and mid-level environmental fidelity simulation, and traditional clinical experience?

Mean and standard deviation score for each subscale (nursing leadership, communication and teaching-learning dyad) and the sum total of the CLECS was measured for the simulation and leadership traditional clinical experiences. A paired-sample t-test was also conducted.

Descriptive statistics were used to answer research question two:

What is the relationship between fifth semester students' perceived learning effectiveness on nursing leadership and teaching-learning dyad for a leadership multiple patient care low-fidelity manikin and mid-level environmental fidelity simulation, and leadership traditional clinical experience?

Mean and standard deviation score for each subscale (nursing leadership, communication and teaching-learning dyad) and the sum total of the CLECS was measured for the simulation and leadership traditional clinical experiences. A paired-sample t-test was also conducted.

Descriptive and inferential statistics were used to answer research question three:

What is the relationship between students' perceived learning effectiveness on communication, nursing leadership, teaching-learning dyad, and sum total score in simulation, and traditional clinical experience?

Mean and standard deviation score for each subscale (nursing leadership, communication and teaching-learning dyad) and the sum total of the CLECS was measured for the simulation and leadership traditional clinical experiences. A mixed design ANOVA was conducted to measure factors of first semester versus fifth semester for each subscale in traditional and simulation environments and the interaction along with the CLECS total sum scores.

Chapter Summary

This chapter described the methods for this descriptive correlational study. The study design examined the relationships between simulation objectives and fidelity of the simulation, and comparing traditional and simulated clinical environments on meeting students' perceived learning needs. The settings, participants, simulations, traditional clinical experiences, and the data collection procedures were described for this study. The CLECS used for data collection was discussed for construction, validity, and reliability. The methods for descriptive data analysis were also described.

CHAPTER 4: RESULTS

Purpose of the Study

The purpose of this study was to explore the relationship of students' perceived learning effectiveness of different levels of fidelity simulation based on the learning objectives and traditional clinical experiences based on the learning objectives. The relationship was also explored between students' perceived effectiveness of simulation and traditional clinical experiences.

Research Questions

Among baccalaureate nursing students at a single southeastern university and measuring perceived learning effectiveness using the Clinical Learning Environments Comparison Survey (CLECS) with the subscales of communication, nursing leadership, and teaching-learning dyad:

1. What is the relationship between first semester students' perceived learning effectiveness on communication and teaching-learning dyad for an initial inpatient care medium-fidelity manikin and mid-level environmental fidelity simulation, and traditional clinical experience?
2. What is the relationship between fifth semester students' perceived learning effectiveness on nursing leadership and teaching-learning dyad for a leadership multiple patient care low-fidelity manikin and mid-level environmental fidelity simulation, and leadership traditional clinical experience?

3. What is the relationship between students' perceived learning effectiveness on communication, nursing leadership, teaching-learning dyad, and sum total score in simulation, and traditional clinical experience?

Participants

The majority population demographics for this group are between the ages of 19-25 years of age (96% and 95%)(Table 4). The majority of the group was female (92 %) and Caucasian (96%). Table 5 is the years of prior experience in healthcare for the participants.

Table 4

Age Range of Participants between the Two Groups (First and Fifth Semesters)

		Age				
Semester		19-25	26-35	36-50	50+	Total
1st	Number	98	4	0	1	103
	% within group	95.1%	3.9%	0	1.0%	100%
5th	Number	149	4	2	0	155
	% within group	96.1%	2.6%	1.3%	0	100%
Total	Number	247	8	2	1	258
	% within group	95.7%	3.1%	0.8%	0.4%	100%

Table 5

Prior Healthcare Clinical Experience between the Two Groups

		Years	Experience			
Semester		<1	1-2	3-4	>5	Total
1st	Number	98	3	1	0	102*
	% within group	96.1%	2.9%	1.0%	0	100%
5th	Number	133	18	1	1	153*
	% within group	86.9%	11.8%	0.7%	0.7%	100%
Total	Number	231	21	2	1	255*
	% within group	90.6%	8.2%	0.8%	0.4%	100%

Note: * Some participants did not provide information for this questions

Analysis

The descriptive statistics for the first semester, fifth semester, and total participants for this study are located in Table 6. The mean scores varied in the traditional and simulated clinical environments for nursing leadership and communication depending on the semester. In the simulated clinical environment, first semester students mean score for communication was 13.95 (*SD* = 5.42) while the fifth semester students mean score was 12.93 (*SD* = 6.53). In the traditional clinical environment first semester students mean score for communication was 14.59 (*SD* = 4.79) while the fifth semester students mean score was 14.77 (*SD* = 5.29). The combined overall communication score for both groups in the simulated clinical environment was 13.34 (*SD* = 6.12) and traditional clinical environment was 14.70 (*SD* = 5.09).

The mean scores for nursing leadership subscale in the simulated clinical environment for first semester students was 53.44 (*SD* = 8.84) and fifth semester students was 54.34 (*SD* = 9.41). The mean scores for nursing leadership subscale in the traditional clinical environment for first semester students was 53.03 (*SD* = 8.15) and fifth semester students was 54.03 (*SD* = 8.34). The combined overall nursing leadership subscale for both groups in the simulated clinical environment was 53.98 (*SD* = 9.18) and in the traditional clinical experience was 53.63 (*SD* = 8.26).

The mean scores for teaching-learning dyad subscale in the simulated clinical environment for first semester students was 21.16 (*SD* = 2.68) and fifth semester students was 20.87 (*SD* = 2.99). The mean scores for teaching-learning dyad subscale in the traditional clinical environment for first semester students was 21.26 (*SD* = 2.59) and fifth semester students was 20.62 (*SD* = 2.72). The combined overall teaching-learning dyad subscale for both groups

in the simulated clinical environment was 20.98 (*SD* = 2.87) and in the traditional clinical experience was 20.88 (*SD* = 2.68).

The total mean scores for all subscales for first semester students in the simulated clinical environment was 88.54 (SD = 14.32) and fifth semester students was 88.14 (SD = 15.58). The total mean scores for all subscales for first semester students in the traditional clinical environment was 88.88 (SD = 13.05) and fifth semester students was 89.41 (SD = 13.30). The combined overall scores for both groups in the simulated clinical environment was 88.30 (SD = 15.06) and for the traditional clinical environment was 89.20 (SD = 13.18).

Table 6

Descriptive Information for Each Subscale and CLECS for First and Fifth Semester Students in Traditional and Simulated Clinical Environments

CLECS Subscales	**Traditional Clinical Environment**			**Simulated Clinical Environment**		
	1st Semester	**5th Semester**	**Overall**	**1st Semester**	**5th Semester**	**Overall**
	M (SD)	***M (SD)***	***M (SD)***	***M (SD)***	***M (SD)***	***M (SD)***
Nursing Leadership (Possible 0-72)	53.03 (8.15)	54.03 (8.34)	53.63 (8.26)	53.44 (8.84)	54.34 (9.41)	53.98 (9.18)
Communication (Possible 0-20)	14.59 (4.79)	14.77 (5.29)	14.70 (5.09)	13.95 (5.42)	12.93 (6.53)	13.34 (6.12)
Teaching-Learning Dyad (Possible 0-24)	21.26 (2.59)	20.62 (2.72)	20.88 (2.68)	21.16 (2.68)	20.87 (2.99)	20.98 (2.87)
Total (Possible 0-116)	88.88 (13.05)	89.41 (13.30)	89.20 (13.18)	88.54 (14.32)	88.14 (15.58)	88.30 (15.06)

Research Question One: First Semester Students

Research Question One: What is the relationship between first semester students' perceived learning effectiveness on communication and teaching-learning dyad for an initial

inpatient care medium-fidelity manikin and mid-level environmental fidelity simulation and traditional clinical experience? A paired sample t-test was selected for analysis because it measures and determines if there is a significant difference between the average values of the same measurement made in two different conditions. Both measurements are made on each subscale in a sample, and the test is based on the paired differences between these two values (Huck, 2008) with a p value set at 0.05. Cohen's d was also measured for effect size of differences with 0.2 a small effect, 0.5 a medium effect, and 0.8 a large effect. Effect size measures the sizes of associations or differences between the groups. Cohen's d is measured by

$$d = \frac{M_{group1} - M_{group2}}{SD_{pooled}}$$

$$SD_{pooled} = \sqrt{(SD^2_{group1} + SD^2_{group2})} /2$$

For first semester students, a comparison was made between each subscale in both the traditional and simulated clinical environments (Table 7).

Table 7

First Semester Students Paired-Sample t-Test on CLECS between Traditional and Simulated Clinical Environments

CLECS Subscales	**Paired-Samples t-Test (*df*=102)**		
	t	***P***	***d***
Nursing Leadership	0.92	.36	0.09
Communication	-1.59	.12	-0.16
Teaching-Learning Dyad	-0.58	.57	-0.06
Total	-0.43	.67	-0.04

Note: * Statistical significance $p < 0.05$

For first semester nursing students the nursing leadership subscale revealed no statistical significance between clinical environments (t = 0.92; p = 0.36; d = 0.09). The communication subscale revealed no statistical significance difference between clinical environments (t = - 1.59; p = 0.12; d = - 0.16). The teaching-learning dyad subscale revealed no statistical significance (t = - 0.58; p = 0.57; d = - 0.06). The total of all subscales of the CLECS revealed no statistical significance (t = – 0.43; p = 0.67; d = -0.04). The negative value favors traditional clinical environment over the medium level fidelity simulated clinical environment for first semester students in the initial patient care experiences.

Research Question Two: Fifth Semester Students

Research Question Two: What is the relationship between fifth semester students' perceived learning effectiveness on nursing leadership and teaching-learning dyad for a leadership multiple patient care low-fidelity manikin and mid-level environmental fidelity simulation and leadership traditional clinical experience? A paired sample t-test was selected for analysis because it measures and determines if this is a significant difference between the average values of the same measurement made in two different conditions. Both measurements are made on each subscale in a sample, and the test is based on the paired differences between these two values (Huck, 2008) with a p value set at 0.05. Cohen's d was also measured for effect size of differences with 0.2 a small effect, 0.5 a medium effect, and 0.8 a large effect. Effect size measures the sizes of associations or differences between the groups. Cohen's d is measured by

$$d = \frac{M_{group1} - M_{group2}}{SD_{pooled}}$$

$$SD_{pooled} = \sqrt{(SD^2_{group1} + SD^2_{group2})/2}$$

For fifth semester students, a comparison was made between each subscale in both the traditional and simulated clinical environments (Table 8).

Table 8

Fifth Semester Students Paired-Sample t-Test on CLECS between Traditional and Simulated Clinical Environments

CLECS Subscales	**Paired-Samples t-Test (*df*=154)**		
	t	***P***	***d***
Nursing Leadership	0.69	.49	0.06
Communication	-4.51	<.001*	-0.36
Teaching-Learning Dyad	1.33	.18	0.11
Total	-1.71	.09	-0.14

Note: * Statistical significance $p < 0.05$

For fifth semester nursing students the nursing leadership subscale revealed no statistical significance between clinical environments ($t = 0.69$; $p = 0.49$; $d = 0.06$). The communication subscale revealed a statistical significance between clinical environments ($t = - 4.51$; $p < 0.001$; $d = - 0.36$) with a small to moderate effect size. The teaching-learning dyad subscale revealed no statistical significance ($t = 1.33$; $p = 0.18$; $d = 0.11$). The total of all subscales of the CLECS revealed no statistical significance ($t = – 1.71$; $p = 0.09$; $d = -0.14$). The negative value for communication favors traditional clinical environment over the lower fidelity leadership simulated clinical environment for fifth semester students in the leadership clinical experiences.

Research Question Three

Research Question Three: What is the relationship between students' perceived learning effectiveness sum total, communication, nursing leadership and teaching-learning dyad in simulation and traditional clinical experience? A mixed design ANOVA was conducted to answer this question. One factor is the semester of the clinical experiences as first and fifth and

the second factor is clinical environments as traditional or simulated (*F* and *p* = 0.05). The interaction was also measured between groups for an effect size (η^2). The *F* value measures variance between groups to variants within groups (Table 9).

Table 9

Comparison of First and Fifth Semester Students in Traditional and Simulated Clinical Environments on the CLECS

		Mixed-Design ANOVA *df*=(1,256)		
CLECS Subscales	**Factor**	***F***	***p***	η^2
Communication	1st vs. 5th	0.43	.52	.002
	Traditional vs. Simulation	17.15	<.001*	.063
	Interaction	4.00	.046*	.015
Nursing Leadership	1st vs. 5th	0.81	.37	.003
	Traditional vs. Simulation	1.17	.28	.005
	Interaction	0.019	.89	<.001
Teaching-Learning Dyad	1st vs. 5th	2.05	.15	.008
	Traditional vs. Simulation	0.27	.60	.001
	Interaction	1.68	.20	.007
Total	1st vs. 5th	0.001	.97	<.001
	Traditional vs. Simulation	2.09	.15	.008
	Interaction	.70	.41	.003

Note: * Statistical significance p < 0.05

The mixed ANOVA factor subscale of communication of the CLECS for first and fifth semester revealed no statistical significance ($F = 0.43$; $p = 0.52$; $\eta^2 = 0.002$). A comparison of traditional and simulated clinical environments revealed a statistical significance ($F = 17.15$; $p = < 0.001$; $\eta^2 = 0.063$) with moderate effect size. The interaction revealed a statistical significance ($F = 4.00$; $p = 0.046$; $\eta^2 = 0.15$) with a small effect size.

The mixed ANOVA factor subscale of nursing leadership of the CLECS for first and fifth semester revealed no statistically significant differences ($F = 0.81$; $p = 0.37$; $\eta^2 = 0.003$). A comparison of traditional and simulated clinical environments revealed no statistically significant differences ($F = 1.17$; $p = 0.28$; $\eta^2 = 0.005$). The interaction revealed no statistically significant differences ($F = 0.019$; $p = 0.89$; $\eta^2 = < 0.001$).

The mixed ANOVA factor subscale of teaching-learning dyad of the CLECS for first and fifth semester revealed no statistically significant differences ($F = 2.05$; $p = 0.15$; $\eta^2 = 0.008$). A comparison of traditional and simulated clinical environments revealed no statistically significant differences ($F = 0.27$; $p = 0.60$; $\eta^2 = 0.001$). The interaction revealed no statistically significant differences ($F = 1.68$; $p = 0.20$; $\eta^2 = 0.007$).

The mixed ANOVA factor for total CLECS for first and fifth semester revealed no statistically significant differences ($F = 0.001$; $p = 0.97$; $\eta^2 = < 0.001$). A comparison of traditional and simulated clinical environments revealed no statistically significant differences ($F = 2.09$; $p = 0.15$; $\eta^2 = 0.008$). The interaction revealed no statistically significant differences ($F = 0.70$; $p = 0.41$; $\eta^2 = 0.003$).

The interaction of the communication subscale was a statistically significant difference with student preference for traditional clinical environment over the simulated clinical environment for the fifth semester and low fidelity simulation.

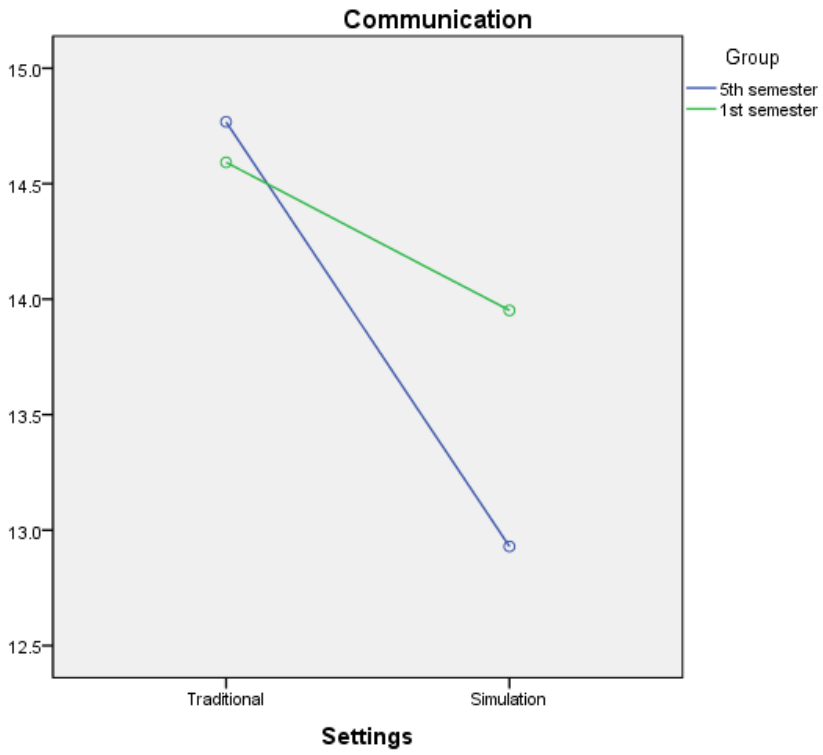

Figure 5. Significance on communication differences between first and fifth semester students in the traditional and simulated clinical environments.

Summary

This chapter described the participants in the first semester (n = 103) and fifth semester (n = 155) in both the traditional and simulated clinical environments. Descriptive statistics, paired sample t-test, effect size, and a mixed design ANOVA were used for the first semester students comparing traditional and simulated clinical environments, fifth semester students comparing traditional and simulated clinical environments, and comparing first and fifth semester students comparing traditional and simulated clinical environments using the CLECS. The subscales for the CLECS were nursing leadership, communication, and teaching-learning dyad along with sum total scores of all subscales. The only statistical significance subscale was

communication with students preferring the traditional clinical environment to the simulated clinical environment.

An exploratory factor analysis with principal component extraction and an oblique rotation identified three subscales: nursing leadership (18 items), communication (5 items), and teaching-learning dyad (6 items). The reliabilities of each subscale with Cronbach's Alpha in each traditional and simulated clinical environments were nursing leadership .933 and .942, communication .828 and .898, teaching-learning dyad .830 and .862, and overall .923 and .935 respectively.

CHAPTER V: SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Purpose of the Study

The purpose of this study was to explore the relationship of students' perceived learning effectiveness of different levels of fidelity simulation based on the learning objectives and traditional clinical experiences based on the learning objectives. The relationship was also explored between students' perceived effectiveness of simulation and traditional clinical experiences.

Research Questions

Among baccalaureate nursing students at a single southeastern university and measuring perceived learning effectiveness using the Clinical Learning Environments Comparison Survey (CLECS) with the subscales of communication, nursing leadership, and teaching-learning dyad:

1. What is the relationship between first semester students' perceived learning effectiveness on communication and teaching-learning dyad for an initial inpatient care medium-fidelity manikin and mid-level environmental fidelity simulation, and traditional clinical experience?
2. What is the relationship between fifth semester students' perceived learning effectiveness on nursing leadership and teaching-learning dyad for a leadership multiple patient care low-fidelity manikin and mid-level environmental fidelity simulation, and leadership traditional clinical experience?

3. What is the relationship between students' perceived learning effectiveness on communication, nursing leadership, teaching-learning dyad, and sum total score in simulation, and traditional clinical experience?

Summary of Findings and Discussion

A cross-sectional study was used to evaluate first and fifth semester students after a simulation experience and completion of the traditional clinical experiences using the CLECS tool for student perceived learning effectiveness for both clinical experiences. Results revealed that by designing a simulation to meet the learning objectives, not just the fidelity level of the simulation, students perceived the learning experience as equitable to the traditional learning experiences. However, the participating students preferred to communicate with human patients and not manikins, especially in the lower level of fidelity simulation.

Research Question One: First Semester Students

Research question one: What is the relationship between first semester students' perceived learning effectiveness on communication and teaching-learning dyad for an initial inpatient care medium-fidelity manikin and mid-level environmental fidelity simulation, and traditional clinical experience? These participants perceived equal learning needs being met for communication, nursing leadership and teaching-learning dyad. The results revealed no statistical significance for communication, nursing leadership and teaching-learning dyad. Students perceived their learning needs based on the focus of the simulated clinical experience were met in both the traditional and simulated clinical environments. The focus of the simulated clinical experiences was learning to communicate with patients and teaching-learning dyad.

The communication subscale of the CLECS did not reveal a difference; however, the negative results show the students favored the traditional clinical experiences over the medium

level fidelity in the simulated clinical environment (t = - 1.59; p = 0.12; d = - 0.16). One possible explanation is this simulated clinical experience was their first interaction with 'patients' and learning to communicate can be an awkward experience that is increased by speaking and listening to a manikin.

Research Question Two: Fifth Semester Students

What is the relationship between fifth semester students' perceived learning effectiveness on nursing leadership and teaching-learning dyad for a leadership multiple patient care low-fidelity manikin and mid-level environmental fidelity simulation, and leadership traditional clinical experience? Students perceived the leadership multiple patient care simulation as an equal experience to the traditional leadership inpatient experience for nursing leadership concepts and teaching-learning dyad. The results revealed no statistical differences for nursing leadership and teaching-learning dyad. Students perceived their learning needs based on the focus of the simulated clinical experience were met in both the traditional and simulated clinical environments. The focus of the simulated clinical experiences was nursing leadership concepts and teaching-learning dyad.

Even though communication was not an objective of this simulation, it was measured with the CLECS. There was a statistical difference for the communication subscale (t = - 4.51; p = < 0.001; d = - 0.36). This difference is probably related to the objectives of using nursing leadership skills and lower fidelity for the simulated clinical experience, not the interaction between the patients and the participants. For this simulation, a decision was made to use low fidelity and have faculty facilitators using flip cards for patient assessment findings instead of interacting with the simulated patient. The effect size was small to moderate, indicating the lower fidelity used in the simulated clinical environment was associated with the differences noted in

the groups. The focus of the fifth semester simulation was not communication with patients, which is measured on the CLECS.

In the traditional inpatient clinical experiences, the participants were able to interact with live patients and communicate. Participants have commented it was hard to communicate with a manikin due to a lack of non-verbal communication and moving extremities. The current high-fidelity manikins possess the ability to respond physiologically to interventions, but lack the ability to show emotions and move their extremities. These limitations are probably the cause for the preference for interacting with human patients over manikins.

Research Question Three

What is the relationship between students' perceived learning effectiveness on communication, nursing leadership, teaching-learning dyad, and sum total score in simulation, and traditional clinical experience? Students perceived learning needs were met in both the traditional and simulated clinical environments based on the CLECS for learning effectiveness nursing leadership, teaching-learning dyad, and sum total score. However, students perceived their learning effectiveness for communication was better met in the traditional clinical experience. This question combined data from both groups of students in both clinical environments. There were no statistical differences in nursing leadership, teaching-learning dyad, and sum total of the CLECS between groups and clinical environments. However, there was a statistically significant difference in communication between the traditional and simulated clinical environment ($F = 17.15$; $p = < 0.001$, $\eta^2 = .063$) indicating a moderate effect size. The interaction was also noted to be significant ($F = 1.68$; $p = 0.046$; $\eta^2 = 0.15$) indicating a small effect size. This is reflected in Figure 5.

The communication subscale difference could be related to the objectives and focus for each simulation. The first semester students were to focus on communication and high-fidelity simulation was incorporated to facilitate communication between the students and the simulated patient manikin. However, in the fifth semester simulation the focus was on nursing leadership and students did not interact with the low-fidelity manikins, but through flip charts for each patient and the faculty facilitator. The fifth semester students preferred the traditional clinical experience for meeting their perceived communication needs. Regardless of first semester or fifth semester students, the scores for the communication were lower in the simulation setting than in the traditional setting. In addition, the discrepancy between these two settings was higher in fifth semester students than in first semester students.

The null hypothesis is there will not be a more significant relationship between the identified students' perceived learning effectiveness subscales of nursing leadership and teaching-learning dyad for fifth semester, and communication and teaching-learning dyad for first semester and the fidelity of the simulation. The null hypothesis was supported for the subscales depending on the objectives of the simulated clinical experience. However, the communication subscale showed tendency toward traditional clinical experiences in both learning environments.

NLN/JSF and Kolb's ELT

This study used the NLN/JSF as the framework for developing the simulated clinical experience. Two of the major simulation design characteristics for a simulated clinical experience are developing clearly stated, appropriate objectives to be obtained in the simulation and the level of fidelity used in the simulated clinical experience. Another important component of the NLN/JSF is outcomes, including participant satisfaction. This study compared objectives

for different levels of students and the level of fidelity used in the simulated clinical environment and then compared this to traditional clinical experiences for the students using the CLECS for perceived learning effectiveness. The objectives determined the fidelity of the simulations for each semester. The fifth semester simulation used low fidelity to meet the objectives and was comparable to the traditional clinical experience for nursing leadership and teaching-learning dyad. There is a lack of empirical data comparing student perceived learning needs in the simulated and traditional clinical experience, especially with low fidelity simulation. This study adds to the body of knowledge for comparing the two learning environments.

Kolb's ELT was the theory base for this study. Traditional and simulated clinical experiences are experiential learning opportunities for participants. This study used all concepts of the ELT. Simulation was the concrete experience for the students. Immediately after the concrete experience (simulation) the participants engaged in a debriefing or guided reflection session to reflect on their experience and connect their actions to patient outcomes. The students then experienced abstract conceptualization for learning from their simulation experience. Then the students had an opportunity for active experimentation to practice what was learned in the traditional clinical experience. The students move between stages using repetitive practice and refinement until the skill or concept was formed into their clinical practice.

Comparison with NCSBN National Simulation Results and INACSL Standards of Best Practice: Simulation

The sample demographics for the NCSBN (Hayden et al., 2014) and this study are similar with percentage of white females in the study. The simulation program and this research study incorporate many recommendations of the NCSBN for the best simulation outcomes. The *INACSL Standards of Best Practice: Simulation* (2013) were used for all the simulation

standards by designing a simulation scenario template for the required information needed for each simulation (Appendix E and G). High quality simulations were used in the research study that were validated by others and had been piloted before for meeting the objectives of the simulation. The researcher of this study has received formal simulation education along with continuing education courses. Kolb's ELT was used as the educational theory and foundation for the simulation and debriefing.

The NCSBN had results for a fundamentals course but not a leadership or transition into professional practice course. This study may expand the body of knowledge for use of simulation in a leadership or transition into professional practice course.

Conclusions

The results revealed in this study support clearly defined simulation objectives and the appropriate level of fidelity to meet the objectives as the foundation for baccalaureate nursing students' simulation clinical experiences for best outcomes. This study supports Standard III: Participant Objectives (Lioce et al., 2013). The clearly developed objectives must be appropriate for the participants' level of knowledge and must be obtainable for the time frame of the simulation. Simulated clinical experiences can be equal learning opportunities for participants if they are developed using the *INACSL Standards of Best Practice: Simulation* (2013) (Hayden et al., 2014). The level of fidelity should be selected based on the level required to meet the clearly defined objectives to be obtained, not the equipment available. Simulation can be an equal clinical experience in meeting student perceived learning needs. For communication, participating students preferred interacting with real patients in the traditional clinical experiences. A comparison between first and fifth semester participants was not conducted.

The focus of this study was comparing the simulation objectives and fidelity for the simulation environment and comparing to traditional clinical environment.

Implications

This study adds to the empirical body of knowledge for student perceived learning effectiveness in both the traditional and simulated clinical environments. It reveals students had equal learning needs met in both clinical experiences, except with communication. Communication learning needs were better met, or a tendency for preference, in the traditional clinical settings.

The NCSBN (Hayden et al, 2014) states to apply their findings there are several qualifiers that need to be incorporated: 1) INACSL Standards of Best Practice: Simulation (2013) should be used; 2) the simulations should be high quality; 3) the debriefing methods should be grounded in an educational theory; and 4) the simulation faculty should be trained and dedicated to simulation. Simulations that are appropriately designed and implemented by trained facilitators using the NLN/JSF, Kolb's ELT and the *INACSL Standards of Best Practice: Simulation* (2013) can be equitable learning experiences for students with the exception of communication.

The simulations used in this study were based on the *INACSL Standards of Best Practice: Simulation (2013)* (Hayden et al., 2014). Standard I Terminology was used in the simulation scenario design and implementation. All participants were required to sign the Professional Integrity and Confidentiality Agreement at the beginning of nursing school based on Standard II. The simulation was based on the learning objectives for each simulation in accordance with Standard III. For Standards IV, VI, and VII, the template used for the simulations addressed the type of facilitation, debriefing, and evaluation implemented for the simulations. For Standard V,

the researcher of this study has received additional formal and informal education for simulation as an educational strategy. This study supports the findings of the NCSBN for high quality simulations implementing the *INACSL Standards of Best Practice: Simulation* (2013) as a substitute for traditional clinical experiences. There is a dearth of research studies using the *INACSL Standards of Best Practice: Simulation 2013*.

It is important for nursing schools to determine alternatives that are comparable to traditional clinical experiences to ensure all nursing students have the same opportunities. Simulation provides clinical experiences that are controlled and provide similar experiences for all students. A comparison between the clinical experiences is also needed because traditional clinical experience sites are more difficult to obtain due to increasing numbers of nursing students. This study supports the finding of the NCSBN study (Hayden et al., 2014) that simulation can be used as an effective teaching learning strategy. However, the NCSBN study did not evaluate simulation and the leadership course. This study adds to the body of knowledge for students' perceived effectiveness of leadership concepts incorporating simulation.

With the increasing use of simulation in nursing education, simulation is replacing some of the traditional clinical experiences for students. As clinical site placement becomes more competitive for placing nursing students in inpatient traditional clinical settings, nurse educators are evaluating other options for clinical experiences. There is a dearth of data comparing simulation and traditional clinical experiences. Most of the data on simulation effectiveness in studies is conducted with high-fidelity simulators. However, high-fidelity simulators are very costly and are not necessary to achieve many outcomes. The fidelity of the simulation should be based on the goals and outcomes desired, not the equipment available. Findings from this study may guide nurse educators in the effective use of simulation strategies.

Recommendations

This study compared the students' perceived learning effectiveness of two groups of students (first and fifth semesters) in different courses in both the traditional and simulated clinical environments. Some limitations were identified for this study and further studies would need to address the lack of diversity of the participants, and participants from only one baccalaureate-nursing program at a southeastern university, for convenience sampling in two of five semesters. It would be beneficial for future studies to not only measure student perceived learning effectiveness, but to include an objective measurement of student performance in both clinical settings using valid and reliable instruments in all curricular clinical courses.

In order for best outcomes to be achieved, simulation faculty should incorporate the INACSL Standards of Best Practice: Simulation (2013) and use templates to ensure the simulated clinical experiences are standardized for participants to decrease variability. The simulated clinical experiences should have clearly defined, appropriate, and obtainable objectives to develop the scenarios.

A future study should compare data obtained on standardized nursing tests that are course specific to measure knowledge. The study would need to be a randomized controlled study to evaluate knowledge along with the student perceived learning effectiveness, and student performance in both the simulated and traditional clinical environments.

Summary

The purpose of this study was to explore the relationship of students' perceived learning effectiveness of different levels of fidelity simulation based on the learning objectives and traditional clinical experience based on the learning objectives. The relationship between students' perceived effectiveness of simulation and traditional clinical experiences was also

explored. Students perceived learning effectiveness using the CLECS revealed the simulated clinical experiences met the learning objectives developed for the scenarios in a first semester initial clinical experiences simulation and a fifth semester multiple patient care leadership scenario. The objectives were more important to student perceived effectiveness than the fidelity used. Communication was one concept where both groups trended toward human interaction in the traditional clinical environment.

This study shows that simulations based on the *INACSL Standards of Best Practice: Simulation (2013)* can be used as a substitution for traditional clinical experiences. The simulated clinical experiences should have a theoretical foundation to guide the learning experiences. Faculty developing simulated learning experiences need education, both formal and informal, for incorporating best practices into educational strategies, theory, and realistic patient care using evidence-based practices for the best outcomes of their students.

REFERENCES

Adamson, K. A., Kardong-Edgren, S., & Willhaus, J. (2012). An updated review of published simulation evaluation instruments. *Clinical Simulation in Nursing, 9*(9), e393-400. http://dx.doi.org/10.1016/j.ecns.2012.09.004

Anderson, D. R., Burnham, K. P., Gould, W. R. & Cherry, S. (2001). Concerns about finding effects that are actually spurious. *Wildlife Society Bulletin, 29*(1), 311-316. Retrieved from http://warnercnr.colostate.edu/~anderson/PDF_files/Concerns.pdf

Alinier, G. (2007a). Enhancing trainees' learning experience through the opening of an advanced multiprofessional simulation training at the University of Hertfordshire. *British Journal of Anaesthetic and Recovery Nursing, 8*(2), 22-27.

Alinier, G. (2007b). A typology of educationally focused medical simulation tools. *Medical Teacher, 29*, e243-e250.

Alinier, G., Harwood, C., Harwood, P., Montague, S., Huish, E., Ruparelia, K., & Antuofermo, M., (2014). Immersive clinical simulation in undergraduate health care interprofessional education: Knowledge and perceptions. *Clinical Simulation in Nursing, 10*(4), e205-e216. http://dx.doi.org/10.1016/j.ecns.2013.12.006

Angelini, D. J. (2011). Interdisciplinary and interprofessional education: What are the key issues and considerations for the future? *Journal of Perinatal and Neonatal Nursing, 25*(2), 175-179.

Arnold, J. J., Johnson, L. M., Tucker, S. J., Chesak, S. S., & Dierkhising, R. A. (2013). Comparison of three simulation-based teaching methodologies for emergency response. *Clinical Simulation in Nursing, 9*(3), e85-e93. doi:10.1016/j.ecns.2011.09.004

Beaubien, J. M., & Baker, D. P., (2004). The use of simulation for training teamwork skills in health care: how low can you go? *BMJ Quality and Safety*, *13*(1), 51-56.

Berkow, S., Virkstis, K., Stewart, J., & Conway, L. (2008). Assessing new graduate nurse performance. *Journal of Nursing Administration, 38*(11), 468-474.

Billings, D. & Halstead, J. (2011). *Teaching in nursing: A guide for faculty* (4th ed.). Philadelphia, PA: W. B. Saunders.

Blum, C. A., Borglund, S., & Parcells, D. (2010). High-fidelity nursing simulation: Impact on student self-confidence and clinical competence. *International Journal of Nursing Education Scholarship, 7*(1). Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/20597857

Brydges, R., Carnahan, H., Rose, D., & Dubrowski, A. (2010). Comparing self-guided learning and educator-guided learning formats for simulation-based clinical training. *Journal of Advanced Nursing, 66*(8), 1832–1844. doi: 10.1111/j.1365-2648.2010.05338.x.

Butler, K. W., Veltre, D. E., & Brady, D. (2009). Implementation of active learning pedagogy comparing low-fidelity simulation versus high-fidelity simulation in pediatric nursing education. *Clinical Simulation in Nursing, 5*(4), e129-e136. doi: 10.1016/j.ecns.2009.03.118

Cant, R. P., & Cooper, S. J. (2010). Simulation-based learning in nurse education: Systematic review. *Journal of Advanced Nursing, 66*(1), 3-15. doi:10.1111/j.1365-2648.2009.05240.x

Cantrell, M. A., Meakim, C., & Cash, K. (2008). Development and evaluation of three pediatric-based clinical simulations. *Clinical Simulation in Nursing, 4*(1), e21-e28.

Cicero, M., Auerbach, M., Zigmont, J., Riera, A., Ching, K., & Baum, C. (2012). Simulation with structured debriefing improves residents' pediatric disaster triage performance. *Prehospital & Disaster Medicine, 27*(3), 239-244.

Clapper, T. C. (2010). Beyond Knowles: What those conducting simulation need to know about adult learning theory. *Clinical Simulation in Nursing, (6)*1, e7-14. doi:10.1016/jecns.2009.07.003

Cooper S., Cant, R., Porter, J., Bogossian, F., McKenna, L., Brady, S., & Fox-Young, S. (2011). Simulation based learning in midwifery education: A systematic review. *Women Birth, 25*(2), 64-78. doi: 10.1016/j.wombi.2011.03.004

Decker, S., Caballero, S., & McClanahan, C. (2014). Foundations of simulation. In Ulrich, B. and Mancini, B. (Eds.). *Mastering precepting: A nurse's handbook for success* (pp. 1-25). Indianapolis, IN: Sigma Theta Tau International.

Deckers, C. M., Doyle, T. A., & Wilkinson, W. J. (2011). Effectively using instructional technologies. In Ulrich, B. and Mancini, B. (Eds.). *Mastering precepting: A nurse's handbook for success* (pp. 135-157). Indianapolis, IN: Sigma Theta Tau International.

De Giovanni, D., Roberts, T., & Norman, G. (2009). Relative effectiveness of high- versus low-fidelity simulation in learning heart sounds. *Medical Education, 43*(7), 661-668.

Dieckmann, P., Gaba, D., & Rall, M. (2007). Deepening the theoretical foundations of patient simulation as social practice. *Simulation in Healthcare, 2*(3), 183-193. doi: 10.1097/SIH.0b013e3180f637f5

Durham, C. F., Cato, M. L., & Lasater, K. (2014). NLN/Jeffries simulation framework state of the science project: Participant construct. *Clinical Simulation in Nursing, 10*(7). 363-372. http://dx.doi.org/10.1016/j.ecns.2014.04.002

Friedman, Z., Siddiqui, N., Katznelson, R., Devito, I., Bould, M. D., & Naik, V. (2009). Clinical impact of epidural anesthesia simulation on short-and long-term learning curve: High- versus low-fidelity model training. *Anesthesia and Pain Medicine, 34*(3), 229-232. doi: 10.1097/AAP.0b013e3181a34345

Gantt, L. T., & Webb-Corbett, R. (2010). Using simulation to teach patient safety behaviors in undergraduate nursing education. *Journal of Nursing Education, 49*(1), 48-51.

Gates, M. G., Parr, M. B., and Hughen, J. E. (2012). Enhancing nursing knowledge using high-fidelity simulation. *Journal of Nursing Education, 5*1(1), 9-15. doi: 10.3928/01484834-20111116-01

Gore, T., Hunt, C. W., Parker, F., & Raines, K. H. (2011). The effects of simulated clinical experiences on anxiety: Nursing students' perspectives. *Clinical Simulation in Nursing, 7*(5), e175-e180.

Gore, T., Hunt, C. W., & Raines, K. H. (2008). Mock hospital unit simulation: A teaching strategy to promote safe patient care. *Clinical Simulation in Nursing, 4*(5), e57-e64. doi:10.1016/ j.ecns.2008.08.006

Gore, T., Leighton, K., Sanderson, B., and Wang, C-H. (2014). Fidelity's effect on student perceived preparedness for patient care. *Clinical Simulation in Nursing, 10*(6), 309-315. http://dx.doi.org/10.1016/j.ecns.2014.01.003

Gore, T. N. & Lioce, L. (2014). Creating effective simulation environments. In B. Ulrich & B. Mancini, (Eds.). *Mastering Simulation: A Handbook for Success* (pp. 49-86). Indianapolis, IN: Sigma Theta Tau International.

Gore, T. & Schuessler, J. B. (2013). Simulation policy development: Lessons learned. *Clinical Simulation in Nursing*, *9*(8), e319-e322. doi: 10.1016/j.ecns.2012.04.005

Gore, T., Van Gele, P., Ravert, P, & Mabire, C. (2012). A 2010 survey of the INACSL membership about simulation use. *Clinical Simulation in Nursing, 8*(4), e125-e133. doi: 10.1016/j.ecns.2012.01.002

Grady, J. L., Kehrer, R. G., Trusty, C. E., Entin, E. B., Entin, E. E., & Brunye, T. T. (2008). Learning nursing procedures: The influence of simulator fidelity and student gender on teaching effectiveness. *Journal of Nursing Education, 47*(9), 403-8. doi: 10.3928/01484834-20080901-09

Groom, J. A., Henderson, D., Sittner, B. J. (2014). NLN/Jeffries simulation framework state of the science project: Simulation design characteristics. *Clinical Simulation in Nursing, 10*(7), 337-344. http://dx.doi.org/10.1016/j.ecns.2013.02.004

Hallmark, B. F., Thomas, C. M., Gantt, L. (2014). The educational practices construct of the NLN/Jeffries simulation framework: State of the science. *Clinical Simulation in Nursing, 10*(7). 345-352. http://dx.doi.org/10.1016/j.ecns.2013.04.006

Ham, K. & O'Rourke, E. (2004). Clinical preparation for beginning nursing students. *Nurse Educator, 29*(4), 139-141.

Harris, K., Eccles, D. W., Ward, P., & Whyte, J. (2013). A theoretical framework for simulation in nursing: Answering Schiavenato's call. *The Journal of Nursing Education, 52*(1), 6-16.

Hayden, J. (2010). Use of simulation in nursing education: National survey results. *Journal of Nursing Regulation, 1*(3), 51- 57.

Hayden, J., Smiley, R. A., Alexander, M., Kardong-Edgren, S., & Jeffries, P. R. (2014). The NCSBN national simulation study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation, 5*(2S), S3-S64.

Hoadley, T. (2009). Learning advanced cardiac life support: a comparison study on the effects of low-and high-fidelity simulation. *Nursing Education Perspectives*, *30*(2), 91-95.

Howard, V., Leighton, K., & Gore, T. (2014). Simulation in healthcare education. In R. Nelson and N. Staggers (Eds.), *Health informatics: An interprofessional approach* (pp.454-471). St. Louis, MO: Elsevier.

Howard, V., Ross, C., Mitchell, A., & Nelson, G. (2010). Human patient simulators and interactive case studies - A comparative analysis of learning outcomes and student perceptions. *Computers, Informatics, and Nursing, 28*(1), 42-48.

Howard, V. M., Englert, N., Kameg, K., & Perozzi, K. (2011). Integration of simulation across the undergraduate curriculum: Student and faculty perspectives. *Clinical Simulation in Nursing, 7*(1), e1-e10. doi:10.1016/j.ecns,2009.10.004

Huck, S. W. (2008). *Reading Statistics and Research*. New York, NY: Pearson.

INACSL Board of Directors (2011). Standard I: Terminology. *Clinical Simulation in Nursing, 7*(4S), s3-s7. doi:10.1016/j.ecns.2011.05.005

INACSL Board of Directors (2011). Standard III: Participant objectives. *Clinical Simulation in Nursing, 7*(4S), s10-s11. doi:10.1016/j.ecns.2011.05.007

International Nursing Association of Clinical Simulation and Learning. (2013). Standards of best practice: Simulation. *Clinical Simulation in Nursing, 9*(6S), Si-S32.

Institute of Medicine (IOM). (2003). *Health professions education: A bridge to quality.* Washington DC: National Academies Press.

Interprofessional Education Collaborative Expert Panel. (2011). *Core Competencies for Interprofessional collaborative practice: Report of an expert panel*. Washington DC: Interprofessional Education Collaborative.

Jeffries, P. R. (2005). A framework for designing, implementing, and evaluating simulations used as teaching strategies in nursing. *Nursing Education Perspectives, 26*(2), 96-103.

Jeffries, P. R. (Ed.). (2007). *Simulation in nursing education: From conceptualization to evaluation.* New York, NY: National League of Nursing.

Jeffries, P. R. (Ed.). (2012). *Simulation in nursing education: From conceptualization to evaluation (2nd ed.)*. New York, NY: National League for Nursing.

Jeffries, P. R. & Rogers, K. J. (2012). Theoretical framework for simulation design. In Jeffries, P. R.(Ed.). *Simulation in nursing education: From conceptualization to evaluation (2nd ed.).* New York, NY: National League for Nursing.

Jeffries, P., & Rizzolo, M. (2006). *NLN/Laerdal project summary report, designing and implementing models for the innovative use of simulation to teach nursing care of ill adults and children: A national multi-site study.* New York, NY: National League for Nursing.

Jones, A. L., Reese, C. R., Shelton, D. P. (2014). NLN/Jeffries simulation framework state of the science project: The teacher construct. *Clinical Simulation in Nursing, 10*(7). 353-362. http://dx.doi.org/10.1016/j.ecns.2013.10.008

Kameg, K., Howard, V., Clochesy, J., Mitchell, A. M., & Suresky, J. (2010). Impact of high fidelity human simulation on self-efficacy of communication skills. *Issues in Mental Health Nursing, 31*(5), 315-323.

Kamp, F., Gore, T., Brown, S. C., Hoadley, T., & Smith, S. (2012). Podium Presentation*: Boots, chaps and cowboy hats: Making simulation real:* 11th Annual Conference International Nursing Simulation and Learning Resource Centers. San Antonio, TX.

Kardong-Edgren, S., Anderson, M., & Michaels, J. (2007). Does simulation fidelity improve student test scores? *Clinical Simulation in Nursing, 3*(1): e21-4. doi: 10.1016/j.ecns.2009.05.035

Kardong-Edgren, S., Lungstrom, N., & Bendel, R. (2009). VitalSim versus SimMan: A comparison of BSN student test scores, knowledge retention, and satisfaction. *Clinical Simulation in Nursing, 5*(3). e105-11. doi:10.1016/j.ecns.2009.01.007

Keene, P. R. (2009). Progression from low fidelity to high fidelity simulators to provide experiential learning for nursing students. *Clinical Simulation in Nursing, 5*(3 suppl), e143. doi: 10.1016/j.ecns.2009.04.047

Kinney, S., & Henderson, D. (2008). Comparison of low fidelity simulation learning strategy with traditional lecture. *Clinical Simulation in Nursing, 4*(2), e15-e18, doi: 10.1016/j.ecns.2008.06.005

Kolb, D. A. (1984). *Experiential learning*. Englewood Cliffs, NJ: Prentice Hall.

LaFond, C. M., & Catherine. (2013). A critique of the National League for Nursing/Jeffries simulation framework. *Journal of Advanced Nursing, 69*(2), 465-480. doi:http://dx.doi.org.spot.lib.auburn.edu/10.1111/j.1365-2648.2012.06048.x

Lapkin, S., & Levett-Jones, T. (2011). A cost-utility analysis of medium vs. high-fidelity human patient simulation manikins in nursing education. *Journal of Clinical Nursing, 20*(23/24), 3543-3552. doi:10.1111/j.1365-2702.2011.03843.x

Laschinger, H. K. (1990). Review of experiential learning theory research in the nursing profession. *Journal of Advanced Nursing*, *15*(8), 985-993.

Lee, K. H. K., Grantham, H., & Boyd, R. (2008). Comparison of high- and low-fidelity mannequins for clinical performance assessment. *Emergency Medicine Australasia, 20*(6), 508-514. doi: 10.1111/j.1742-6723.2008.01137.x

Leighton, K. L. (2007). Clinical learning environment comparison survey. In Learning needs in the traditional clinical environment and the simulated clinical environment: A survey of undergraduate nursing students. (Doctoral dissertation). Retrieved from ETD collection for University of Nebraska - Lincoln. (Paper AAI3271929)

Leonard, B., Shuhaibar, E. L., & Chen, R. (2010). Nursing student perceptions of intraprofessional teach education using high-fidelity simulation. *Journal of Nursing Education, 4*(11), 628-631. doi: 10.3928/01484834-20100730-06

Lewis, R., Strachan, A., & Smith, M. M. (2012). Is high fidelity simulation the most effective method for the development of non-technical skills in nursing? A review of the current evidence. *The Open Nursing Journal, 6*, 82.

Lioce, L., Reed, C. C., Lemon, D., King, M. A., Martinez, P. A., Franklin, A. E., … Borum, J. C. (2013). Standards of best practice: Simulation standard III: Participant objectives. *Clinical Simulation in Nursing, 9*(6s), s15-s18. http://dx.doi.org/10.1016/j.ecns.2013.04.005

Lisko, S. A., & O'Dell, V. (2010). Integration of theory and practice: Experiential learning theory and nursing education. *Nursing Education Perspectives, 11*(2), 106-108.

Lyle, K. E. (2009). *Teacher perceptions of their technology education curricula. (Doctoral dissertation).* Retrieved from http://gradworks.umi.com/33/85/3385448.html UMI Number: 3385448.

Maran, N. J., & Glavin, R. J. (2003). Low-to high-fidelity simulation-A continuum of medical education. *Medical Education, 37*(Suppl. 1), 22-28.

McCurry, M. K., & Martins, D. C. (2010). Teaching undergraduate nursing research: A comparison of tranditional and innovative approaches for success with millennial learners. *Journal of Nursing Education, 44*(1), 31-34.

McGaghie, W., Issenberg, S. B., Petrusa, E., & Scalese, R. (2009). A critical review of simulation-based medical education research: 2003-2009. *Medical Education, 44*, 50-63. doi: 10.1111/j.1365-2923.2009.03547.x

Meakim, C., Boese, T., Decker, S., Franklin, A. E., Gloe, D., Lioce, L., . . . Borum, J. C. (2013). Standards of best practice: Standard I: Terminology. *Clinical Simulation in Nursing, 9*(6S), S3-S11. http://dx.doi.org/10.1016/j.ecns.2013.04.001

Meyer, M. N., Connors, H., Hou, Q., & Gajewski, B. (2011). The effect of simulation in clinical performance: a junior nursing student clinical comparison study. *Simulation in Healthcare, 6*(5), 269-77. doi: 10.1097/SIH.0b013e318223a048

National Council of State Boards of Nursing (n.d). *NCSBN national simulation study*. Retrieved from: https://www.ncsbn.org/2094.htm

National League for Nursing Simulation Innovation Resource Center (NLN-SIRC). (2010). *SIRC glossary*. Retrieved from http://sirc.nln.org/mod/glossary/view.php?id=183

Nehring, W. M. (2010). History of simulation in nursing. In W. M. Nehring & F. R. Lashley (Eds.), *High-fidelity Patient Simulation in Nursing Education* (pp. 3-26). Sudbury, MA: Jones and Bartlett Publishers.

O'Donnell, J. M., Decker, S., Howard, V., Levett-Jones, T., & Miller, C. W. (2014). NLN/Jeffries simulation framework state of the science project: Simulation learning outcomes. *Clinical Simulation in Nursing, 10*(7), 373-382. http://dx.doi.org/10.1016.j.ecns.2014.06.004 .

Poore, J. A., Cullen, D. L., & Schaar, G. L. (2014). Simulation-based interprofessional education guided by Kolb's experiential learning theory. *Clinical Simulation in Nursing 10*(5), e241-247. http://dx.doi.org/10.1016/j.ecns.2014.01.004 .

Radhakrishnan, K., Roche, J. P., & Cunningham, H. (2007). Measuring clinical practice parameters with human patient simulation: A pilot study. *International Journal of Nursing Education Scholarship, 4*(1), 1-11.

Reed, S. J. (2012). Debriefing experience scale: Development of a tool to evaluate the student learning experience in debriefing. *Clinical Simulation in Nursing, 8*(6), e211-e217. doi:10.1016/j.ecns.2011.11.002 .

Regan, M. J., & Onello, R. (2013). Knowledge, action and reflection: A theoretically based model for use with high fidelity simulation in nursing education. *Journal of Nursing Education and Practice, 3*(7), 106-113.

Reese, C. E., Jeffries, P. R., & Engrum, S. A. (2010). Learning together: Using simulations to develop nursing and medical student collaboration. *Nursing Education Perspectives, 31*(1), 33-37.

Robin, B. R., McNeil, S. G., Cook, D. A., Agarwal, K. L., & Singhal, G. R. (2011). Preparing for the changing role of instructional technologies in medical education. *Academic Medicine, 86*(4), 435-441.

Robinson-Smith, G., Bradley, P., & Meakim, C. (2009). Evaluating the use of standardized patients in undergraduate psychiatric nursing experiences. *Clinical Simulation in Nursing, 5*(6), e203-e211. doi:10.1016/j.ecns.2009.07.001

Rourke, L., Schmidt, M., & Garga, N. (2010). Theory-based research of high fidelity simulation use in nursing education: A review of the literature. *International Journal of Nursing Education Scholarship, 7*(1). doi: 10.2202/1548-923X.1965

Rudolph, J. W., Simon, R., Raemer, D. B. (2007). Which reality matters? Questions on the path to high engagement in healthcare simulation. *Simulation in Healthcare 2*(3), 161-163. doi: 10.1097/SIH.0b013e31813d1035

Schiavenato, M. (2009). Reevaluating simulation in nursing education: Beyond the human patient simulator. *The Journal of Nursing Education, 48*(7), 388-394.

Schlairet, M. C., & Fenster, M. J. (2012). Dose and sequence of simulation and direct care experiences among beginning nursing students: A pilot study. *The Journal of Nursing Education, 51*(12), 668-675.

Shinnick, M., Woo, M., Horwich, T. B., & Steadman, R. (2011). Debriefing: The most important component in simulation? *Clinical Simulation in Nursing, 7*(3), e105-e111. doi: http://dx.doi.org/10.1016/j.ecns.2010.11.005 .

Skiba, D. J., Connors, H. R., & Jeffries, P. R. (2008). Information technologies and the transformation of nursing education. *Nursing Outlook, 56*(5), 225-230.

Smith, M. K. (2002). Malcolm Knowles, information adult education, self-direction, and andragogy. *The Encyclopedia of Informal education.* Retrieved from www.infed.org/thinkers/et-knolw.htm .

The Free Dictionary. (n.d.). Spurious relationship. Retrieved from http://www.thefreedictionary.com/Spurious+relationship .

Tiffen, J., Corbridge, S., Shen, B. C., & Robinson, P. (2010). Patient simulator for teaching heart and lung assessment skills to advanced practice nursing students. *Clinical Simulation in Nursing, 7*(3), e91-e97. doi 10.1016/j.ecns.2009.10.003

Todd, M., Manz, J., Hawkins, K., Parsons, M., Hercinger, M. (2008). The development of a quantitative evaluation tool for simulations in nursing education. International Journal of Nursing Scholarship, 5 (1), 1-17.

Tosterud, R., Hedelin, B., & Hall-Lord, M. L. (2013). Nursing students' perceptions of high- and low-fidelity simulation used as learning method. *Nurse Education in Practice, 13*(4), 262-270.

Wachter, R. M. (2004). The end of the beginning: Patient safety five years after "to err is human." *Health Affair, 4*, 534-545.

Walden, M. H. & Olson, J. K. (2010). Taking the patient to the classroom: Applying theoretical frameworks to simulation in nursing education. *International Journal of Nursing Education Scholarship, 4*(1), 1-14.

Walton, J., Chute, E., & Ball, L. (2011). Negotiating the role of the professional nurse: The pedagogy of simulation: A grounded theory study. *Journal of Professional Nursing, 27*(5), 299-310.

Wang, A. L., Fitzpatrick, J. J., & Petrini, M. A. (2013). Comparison of two simulation methods on Chinese BSN students' learning. *Clinical Simulation in Nursing, 9*(6), e207-e212. doi:10.1016/j.ecns.2012.01.007

Waxman, K. T., & Telles, C. (2009). The use of Benner's framework in high-fidelity simulation faculty development: The Bay Area Simulation Collaborative model. *Clinical Simulation in Nursing, 5*(6), e231-e235. doi:10.1016/j.ecns.2009.06.001

Weaver, A. (2011). High-fidelity patient simulation in nursing education: An integrative review. *Nursing Education Perspectives, 32*(1), 37-40.

Webster Online Dictionary. (2013). Retrieved January 25, 2013 from http://www.merriam-webster.com/dictionary/moulage.

Wickens, C. D. (2000). The trade-off of design for routine and unexpected performance: Implications of situation awareness. In M. R. Endsley & D. J. Garland (Eds.), *Situation awareness analysis and measurement* (211-225). Mahwah, NJ: Lawrence Erlbaum Associates.

APPENDIX A

Permission from NLN to use the NLN/JSF Model

Dear Teresa:

The NLN has received your request for permission to include the figure of the NLN/Jeffries Simulation Framework in your dissertation. We are pleased to grant you copyright permission according to the following.

"The NLN/Jeffries Simulation framework," developed as part of the 2003- 2006 NLN/Laerdal Simulation Study and most recently published on page 37 of the work noted below, may be used within your dissertation.

Jeffries, P. R. (2012). Simulation in nursing education: From conceptualization to evaluation. New York, NY: National League for Nursing.

In granting permission to use this Framework, it is understood that the following assumptions operate and "caveats" will be respected.

- The Framework will only be used for the purpose outlined above.
- The Framework will be included in its entirety and not modified in any way.
- The National League for Nursing is the sole owner of these rights being granted.
- No fees are being charged for this permission.

The NLN is pleased that this material is seen as valuable to you in your research, and I am pleased that we are able to grant permission for its use.

Should you have any questions, please contact me directly.

Best wishes as you complete your doctoral studies and dissertation.

Respectfully Yours,
Amy

Amy McGuire | Administrative Coordinator, NLN Chamberlain Center | National League for Nursing | www.nln.org | amcguire@nln.org | Tel: 202-909-2509 | The Watergate | 2600 Virginia Avenue NW, 8th Fl, Washington, DC 20037

APPENDIX B

Institutional Review Board (IRB) Approval

AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMANSUBJECTS

RESEARCH PROTOCOL REVIEW FORM

For Information or help contact **THE OFFICE OF HUMAN SUBJECTS RESEARCH**, 307 Samford Hall, Auburn University
Phone: 334-844-5966 **e-mail:** hsubjec@auburn.edu **Web Address:** http://www.auburn.edu/research/vpr/ohs/

Complete this form using Adobe Acrobat (versions 5.0 and greater). Hand written copies not accepted.

1. PROPOSED START DATE of STUDY: Nov 4, 2010

PROPOSED REVIEW CATEGORY (Check one): ☐ FULL BOARD ☑ EXPEDITED ☐ EXEMPT

2. PROJECT TITLE: Higher levels of Fidelity versus Low Fidelity Patient Simulation's Effect on Student Perception of Preparedness for Human Patient Care

3.

Teresa Gore	Asst Clinical Prof	School of Nursin	334-844-7360	goreter@auburn.edu
PRINCIPAL INVESTIGATOR	TITLE	DEPT	PHONE	AU E-MAIL
212 Miller Hall		334-844-5654		gore3894@charter.net
MAILING ADDRESS			FAX	ALTERNATE E-MAIL

4. SOURCE OF FUNDING SUPPORT: ☑ Not Applicable ☐ Internal ☐ External Agency: _____ ☐ Pending ☐ Received

5. LIST ANY CONTRACTORS, SUB-CONTRACTORS, OTHER ENTITIES OR IRBs ASSOCIATED WITH THIS PROJECT:

6. GENERAL RESEARCH PROJECT CHARACTERISTICS

6A. Mandatory CITI Training

Names of key personnel who have completed CITI:
Dr. Teresa Gore ✓ Biomed
Dr. Kim Leighton ✓ SBE
Karol Renfroe ✓ Biomed

CITI group completed for this study: ☐ Social/Behavioral ☑ Biomedical

Protocol-Specific modules completed:
☐ Genetic ☐ Vet.'s Administration
☐ International ☐ Prisoner Research
☐ Public School Students ☐ Pregnant Women/Fetuses
Other _____

6B. Research Methodology

Please check all descriptors that best apply to the research methodology.

Data Source(s): ☑ New Data ☑ Existing Data

Will data be recorded so that participants can be directly or indirectly identified? ☐ Yes ☑ No

Data collection will involve the use of:

☐ Educational Tests (cognitive diagnostic, aptitude, etc.)
☑ Surveys / Questionnaires
☐ Internet / electronic
☑ Audio / Video / Photos
☑ Interview / Observation
☐ Physical / Physiological Measures or Specimens (see Section 6E.)
☐ Private records or files

6C. Participant Information

Please check all descriptors that apply to the participant population.
☑ Males ☑ Females ☑ AU students

Vulnerable Populations
☐ Pregnant Women/Feluses ☐ Children and/or Adolescents (under age 19 in AL)
☐ Prisoners

Persons with:
☐ Economic Disadvantages ☐ Physical Disabilities
☐ Educational Disadvantages ☐ Intellectual Disabilities

Do you plan to compensate your participants? ☐ Yes ☑ No

6D. Risks to Participants

Please identify all risks that participants might encounter in this research.
☑ Breach of Confidentiality* ☑ Coercion
☐ Deception ☐ Physical
☐ Psychological ☐ Social
☐ None ☐ Other _____

*Note that if the investigator is using or accessing confidential or identifiable data, breach of confidentiality is always a risk.

6E. Institutional Biosafety Approval

Do you need IBC Approval for this study? ☑ No ☐ Yes - BUA #_____ Expiration date _____

RECEIVED 2010

e Auburn University Institutional Review
board has approved this document for use
from 10/27/10 to 10/26/11
Protocol # 10-308 EP 1010

FOR OHSR OFFICE USE ONLY

DATE RECEIVED IN OHSR: 10-19-10 by BK
DATE OF IRB REVIEW: ~~10/27/10~~ by FW
DATE OF IRB APPROVAL: by
COMMENTS: NO REVISIONS

PROTOCOL # 10-308 EP 1010
APPROVAL CATEGORY: 45 CFR 46.110 (#7)
INTERVAL FOR CONTINUING REVIEW: 1 year

7. PROJECT ASSURANCES

PROJECT TITLE: Higher levels of Fidelity versus Low Fidelity Patient Simulation's Effect on Student Perception of Preparedness for Human Patient Care

A. PRINCIPAL INVESTIGATOR'S ASSSURANCES

1. I certify that all information provided in this application is complete and correct.
2. I understand that, as Principal Investigator, I have ultimate responsibility for the conduct of this study, the ethical performance this project, the protection of the rights and welfare of human subjects, and strict adherence to any stipulations imposed by the Auburn University IRB.
3. I certify that all individuals involved with the conduct of this project are qualified to carry out their specified roles and responsibilities and are in compliance with Auburn University policies regarding the collection and analysis of the research data.
4. I agree to comply with all Auburn policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection of human subjects, including, but not limited to the following:
    a. Conducting the project by qualified personnel according to the approved protocol
    b. Implementing no changes in the approved protocol or consent form without prior approval from the Office of Human Subjects Research
    c. Obtaining the legally effective informed consent from each participant or their legally responsible representative prior to their participation in this project using only the currently approved, stamped consent form
    d. Promptly reporting significant adverse events and/or effects to the Office of Human Subjects Research in writing within 5 working days of the occurrence.
5. If I will be unavailable to direct this research personally, I will arrange for a co-investigator to assume direct responsibility in my absence. This person has been named as co-investigator in this application, or I will advise OHSR, by letter, in advance of such arrangements.
6. I agree to conduct this study only during the period approved by the Auburn University IRB.
7. I will prepare and submit a renewal request and supply all supporting documents to the Office of Human Subjects Research before the approval period has expired if it is necessary to continue the research project beyond the time period approved by the Auburn University IRB.
8. I will prepare and submit a final report upon completion of this research project.

My signature indicates that I have read, understand and agree to conduct this research project in accordance with the assurances listed above.

Teresa N. Gore		Oct 12, 2010
Printed name of Principal Investigator	Principal Investigator's Signature	Date

B. FACULTY ADVISOR/SPONSOR'S ASSURANCES

1. By my signature as faculty advisor/sponsor on this research application, I certify that the student or guest investigator is knowledgeable about the regulations and policies governing research with human subjects and has sufficient training and experience to conduct this particular study in accord with the approved protocol.
2. I certify that the project will be performed by qualified personnel according to the approved protocol using conventional or experimental methodology.
3. I agree to meet with the investigator on a regular basis to monitor study progress.
4. Should problems arise during the course of the study, I agree to be available, personally, to supervise the investigator in solving them.
5. I assure that the investigator will promptly report significant adverse events and/or effects to the OHSR in writing within 5 working days of the occurrence.
6. If I will be unavailable, I will arrange for an alternate faculty sponsor to assume responsibility during my absence, and I will advise the OHSR by letter of such arrangements. If the investigator is unable to fulfill requirements for submission of renewals, modifications or the final report, I will assume that responsibility.
7. I have read the protocol submitted for this project for content, clarity, and methodology

Printed name of Faculty Advisor / Sponsor	Signature	Date

C. DEPARTMENT HEAD'S ASSSURANCE

By my signature as department head, I certify that I will cooperate with the administration in the application and enforcement of all Auburn University policies and procedures, as well as all applicable federal, state, and local laws regarding the protection and ethical treatment of human participants by researchers in my department.

Dr. Gregg Newschwander		10/12/10
Printed name of Department Head	Signature	Date

8. PROJECT OVERVIEW: Prepare an abstract that includes:
(400 word maximum, in language understandable to someone who is not familiar with your area of study):

I.) A summary of relevant research findings leading to this research proposal, (*Cite sources; include a "Reference List" as Appendix A.)*
II.) A brief description of the methodology,
III.) Expected and/or possible outcomes, and,
IV.) A statement regarding the potential significance of this research project.

A mock hospital unit simulation with static mannequins was conducted in 2007 as a pilot study (n=24) (Gore, Hunt, & Raines, 2008) and 2008 (Gore, Hunt, Parker, & Raines, in-press) as an expanded study with implementation to the entire junior nursing class (n=91). A statistically significant decrease in anxiety level was noted with both studies This experience continues to evolve to meet the needs of the students. Student feedback about the experience indicated that the simulation experience was effective as preparation for the clinical experience. Students noted the need for simulation to be interactive and all students should participate prior to human patient contact.

Teaching students expectations of the clinical setting will allow them to function in the clinical setting with a lower anxiety level. Ham and O'Rourke (2004) conducted a pilot study with undergraduate nursing students who participated in a hospital simulation during the first semester of the nursing program. Rather than spending a day in a clinical rotation, the students spent one "shift" in the laboratory setting using human patient simulation. The beginning nursing students showed improvement in the transition from the skills lab to the hospital setting along with a marked decrease in anxiety levels.
Several studies have been conducted comparing high and low levels of fidelity which reflect some differences and increased satisfaction with increasing levels of fidelity, but no statistical significant difference (Hoadley, 2009; De Giovanni, Roberts, & Norman, 2009; Lee, Grantham, & Boyd, 2008; Kardong-Edgren, Lungstrom, & Bendel, 2009; Kardong-Edgren, Anderson, & Michaels, 2007;). Other studies indicated the higher fidelity simulation was perceived to increase critical thinking (Butler, Veltre, & Brady, 2009). However, the data has not saturated the literature and further studies need to be conducted. The second part of this study, the re-evaluation of the simulation as a preparation for human patient care, has not been conducted and is a needed area for research.

The study design method is a randomized two group quasi-experimental from a convenience sampling using the correlation of fidelity of simulated patient during mock hospital unit and students' perceived preparedness. The convenience sample will be obtained from students enrolled in NURS 3130 and 3141 Fall 2010 and Spring 2011. The evaluation tools to be used include the Simulation Effectiveness Tool (SET) and the Clinical Learning Environment Comparison Survey. The SET will be repeated after 4 weeks of human patient contact and the Clinical Learning Environment Comparison Survey.

The hypothesis to be tested is "Junior level beginning nursing students will have increased perception of preparedness for human patient care after mock hospital unit simulation with higher level fidelity simulated patients versus students in the same setting with low fidelity static mannequins."

9. PURPOSE.

a. Clearly state all of the objectives, goals, or aims of this project.

The objective for this project are to determine if prior practice with higher level fidelity human patient simulation in a controlled environment influences students' perception of preparedness more than low fidelity human patient simulation prior to human patient contact while incorporating selected Quality and Safety in Nursing Education (QSEN) indicators. The research question is: "Will junior level beginning nursing students have increased perception of preparedness for human patient care after mock hospital unit simulation with higher level fidelity simulated patients versus students in the same setting with low fidelity static mannequins?" The goal of this project is to add to the empirical data for use of higher levels of fidelity in nursing education.

b. How will the results of this project be used? (e.g., Presentation? Publication? Thesis? Dissertation?)

We anticipate that the results will be published and/or presented at professional meetings (podium and/or poster) and/or in peer-reviewed journals.

10a. KEY PERSONNEL. Describe responsibilities. Include information on research training or certifications related to this project. **CITI is required.** Be as specific as possible. (Attach extra page if needed.) *All non AU-affiliated key personnel must attach **CITI certificates of completion.***

Principle Investigator Teresa N. Gore Title: Asst Clinical Prof E-mail address goreter@auburn.edu
Dept / Affiliation: AU School of Nursing

Roles / Responsibilities:
Dr. Gore will be involved in all aspects of this project: Scenario development, responsible for facilitating the simulation experience for all involved AUSON students, informing students about the project, administering evaluation tool, coordinating study, assisting data analysis and program evaluation, and manuscript presentation development and delivery

Individual: Dr. Kim Leighton Title: Dean of Technolog E-mail address
Dept / Affiliation: Bryan LGH Health Science Center

Roles / Responsibilities:
Mentor role for Dr. Gore and Ms. Renfroe as a simulation expert. Assist with data analysis and use of the Clinical Learning Environment Comparison Survey.

Individual: Karol Renfroe Title: Lab Coordinator E-mail address kcr001@auburn.edu
Dept / Affiliation: AUSON

Roles / Responsibilities:
Co-Coordinator for AUSON involved in all aspects of the mock hospital unit simulations; present during all simulations, informing students about the project, responsible for facilitating simulation experience for all involved students and faculty, administering the evaluation tool, scheduling and coordinating the project, assisting with data collection and analysis, program evaluation, manuscript development

Individual: Title: E-mail address
Dept / Affiliation:

Roles / Responsibilities:

Individual: Title: E-mail address
Dept / Affiliation:

Roles / Responsibilities:

Individual: Title: E-mail address
Dept / Affiliation:

Roles / Responsibilities:

11. LOCATION OF RESEARCH. List all locations where data collection will take place. (School systems, organizations, businesses, buildings and room numbers, servers for web surveys, etc.) Be as specific as possible. Attach permission letters in Appendix E.
(See sample letters at http://www.auburn.edu/research/vpr/forms/sample.htm)
AUSON simulation lab and Clinical Skills Lab and auditorium (rooms 201, 207, & 230 Miller Hall AU Campus)

12. PARTICIPANTS.

a. Describe the participant population you have chosen for this project.
(If data are existing, check here ☐ and describe the population from whom data were collected.)
All enrolled first semester BSN students, age 19 or older enrolled in NURS 3130/3141 (Fundamentals and assessment courses) at AUSON in Fall 2010 and Spring 2011.

b. Describe why is this participant population is appropriate for inclusion in this research project. (Include criteria for selection.)
This study is to determine the effects of varying levels of fidelity in human patient simulation on beginning BSN students' perception of effective preparation for human patient contact. First semester nursing students are appropriate for this study because they have no prior experience with human patient care as a nursing student.

c. Describe, step-by-step, all procedures you will use to recruit participants. *Include in Appendix B a copy of all e-mails, flyers, advertisements, recruiting scripts, invitations, etc., that will be used to invite people to participate.*
(See sample documents at http://www.auburn.edu/research/hrpp/ohrs/sample.htm.)
All first semester nursing students at AU enrolled in NURS 3130 and 3141 for Fall 2010 and Spring 2011are required to participate in the mock hospital unit simulation. However, only students who voluntarily choose to participate by signing an informed consent will have their data utilized for this study. Dr. Gore will explain the purpose of the mock hospital unit simulation, high fidelity versus low fidelity and how it will be used in the course. Dr. Bonnie Sanderson will then present the research study, the informed consent letters and answer any questions. See Script in Appendix . Once the consent forms have been signed, the student will sign a document and record a unique identifier to be used in the project. This information will be kept confidential by Dr. Sanderson who will link the data and provide investigators with a set of linked data when the course is completed and grades posted.

What is the minimum number of participants you need to validate the study? 60

Is there a limit on the number of participants you will recruit? ☐ No ☑ Yes – the number is 108

Is there a limit on the number of participants you will include in the study? ☐ No ☑ Yes – the number is 108

d. Describe the type, amount and method of compensation and/or incentives for participants.
(If no compensation will be given, check here ☑)

Select the type of compensation: ☐ Monetary ☐ Incentives
☐ Raffle or Drawing incentive (Include the chances of winning.)
☐ Extra Credit (State the value)
☐ Other

Description:

13. PROJECT DESIGN & METHODS.

a. Describe, step-by-step, all procedures and methods that will be used to consent participants.
(☐ Check here if this is "not applicable"; you are using existing data.)

A quasi-experimental design will be used for students enrolled in NURS 3130 and 3141 at AUSON. Those who choose to participate will be asked to complete Simulation Effectiveness Tool after mock hospital unit simulation and prior to actual human patient contact then repeat the tool 4 weeks after human patient care. The control group will consist of students who use low-fidelity static mannequins and the study group will be students who utilize the higher level of fidelity patient simulators. All students will be required to participate in the mock hospital simulation as one of their clinical experiences. However, only students who sign an informed consent will have their data used for this study.

b. Describe the procedures you will use in order to address your purpose. Provide a step-by-step description of how you will carry out this research project. Include specific information about the participants' time and effort commitment. (*NOTE: Use language that would be understandable to someone who is not familiar with your area of study. Without a complete description of all procedures, the Auburn University IRB will not be able to review this protocol. If additional space is needed for this section, save the information as a .PDF file and insert after page 6 of this form.*)

During the eighth week of class, students in the Fall 2010 and Spring 2011 class will be approached regarding the use of their post simulation data from their experience in mock hospital participation with low-fidelity and higher level fidelity mannequins as part of their clinical experience. This simulated experience will be conducted in the skills and bed labs along with simulation rooms at AUSON.

Prior to participation, Dr. Gore will explain the purpose of the mock hospital unit simulation and how it will be used in the course. Dr. Bonnie Sanderson will then present the research study, the informed consent letters, and answers to questions (See Script: Appendix). Once the consent forms have been signed, the student will sign a document and record a unique identifier to be used in the project. Dr. Bonnie Sanderson will handle data management for the project until the course is completed and grades posted.
Approximately 1/2 of the eight clinical groups will be randomly assigned to the high fidelity study group. The remaining students will be randomly assigned to use low-fidelity mannequins for the project.

The simulation and laboratory setting will be arranged to portray an actual patient room and nursing unit in an inpatient medical surgical unit. Patient problems pertaining to safety will be built into each scenario that will require the student to start using critical thinking and clinical judgment to ensure patient safety. Each mannequin will have a patient chart with all data of an actual patient chart using patients from the Evolve Simulation Learning Systems (SLS) Fundamentals course. The BSN students will formulate a plan of care specific to the patient's diagnosis and needs. They will administer medications, treatments, and perform all nursing care during the shift. Electronic charting will be completed on all patients.

After four weeks of human patient care, students will be asked to complete the Simulation Effectiveness Tool to rate the Mock Hospital Simulation effectiveness in preparing students for human patient care. This tool will be collected by Dr. Sanderson.

The evaluation measures will not contain the student name - only codes. The Simulation Effectiveness Tool and The Clinical Learning Environment Comparison Survey will be turned In to Dr.Sanderson, who will only provide the researchers with data from consenting students. Only codes will be used on the final data for research. The sign up sheet that identifies the student's name with student's codes will then be destroyed by shredding. There will no longer be a way to link the data to a specific student.

13c. List all data collection instruments used in this project, in the order they appear in Appendix C.
(e.g., surveys and questionnaires in the format that will be presented to participants, educational tests, data collection sheets, interview questions, audio/video taping methods etc.)

Simulation Effectiveness Tool
Clinical Learning Environment Comparison Survey

d. Data analysis: Explain how the data will be analyzed.

Two-tailed t-test, ANCOVA

14. RISKS & DISCOMFORTS: List and describe all of the risks that participants might encounter in this research. *If you are using deception in this study, please justify the use of deception and be sure to attach a copy of the debriefing form you plan to use in Appendix D.* *(Examples of possible risks are in section #6D on page 1.)*

There is a risk that the beginning BSN students will feel coerced into allowing data to be used in research. All students are required to participate in this clinical experience regardless of study participation.

Mild anxiety may occur as they engage in the simulated clinical experience. The risk of conducting assessments and evaluations listed above however are no greater than "minimum risk" as there are no additional risks identified above and beyond the typical clinical rotation participation.

Breach of confidentiality may be a risk.

15. PRECAUTIONS. Identify and describe all precautions you have taken to eliminate or reduce risks as listed in #14. If the participants can be classified as a "vulnerable" population, please describe additional safeguards that you will use to assure the ethical treatment of these individuals. ***Provide a copy of any emergency plans/procedures and medical referral lists in Appendix D.***

Dr. Gore will inform these students of the purpose of data collection and that all students are required to participate in the mock hospital unit simulation as part of their clinical experience for the course. However, informed consent is absolutely voluntary for the data to be used in research. Even after an AU student agrees to participate, they may withdraw at anytime by providing a statement with only their unique identifier information that they wish to withdraw from the research study. The informed consents will be administered, collected, and maintained by Dr. Sanderson until the simulations are completed and all data have been collected. Dr. Sanderson is not assigned as faculty to the junior level nursing students and does not assign grades to these students.

Confidentiality will be maintained by using only the students self-selected identifying number. This will be maintained in a locked file cabinet in Dr. Sanderson's office in room 142 Miller Hall.

If using the Internet to collect data, what confidentiality or security precautions are in place to protect (or not collect) identifiable data? Include protections used during both the collection and transfer of data.
(These are likely listed on the server's website.)

N/A

16. BENEFITS.

a. List all realistic direct benefits participants can expect by participating in this specific study.
(Do not include "compensation" listed in #12e.) Check here if there are no direct benefits to participants. ☐

Although there may be benefits to participation in the clinical simulation, there are no benefits to the participants for allowing their data to be included in the study.

b. List all realistic benefits for the general population that may be generated from this study.

Demonstration of a method to improve the quality and safety of nursing care delivered by nursing students and graduates to deliver high quality, safe, effective care to the general population in the area in which they will practice. This methodology could potentially help decrease medication errors and erroneous patient identification measures. Through a controlled, risk-free environment students can learn to respond appropriately to patient through effective communication techniques and provide proper nursing care. This study may add to the empirical data for use of higher levels of fidelity for nursing education.

17. PROTECTION OF DATA.

a. Will data be collected as anonymous? ☐ Yes ☑ No
("Anonymous" means that you will not collect any identifiable data.)

b. Will data be collected as confidential? ☑ Yes ☐ No
("Confidential" means that you will collect and protect identifiable data.)

c. If data are collected as confidential, will the participants' data be coded or linked to identifying information?
☑ Yes No ☐
Code list for linking data will be maintained by Dr. Bonnie Sanderson and stored in a locked cabinet in Room 142 Miller Hall. Once the data are linked, the code list will be destroyed by shredding.

d. Justify your need to code participants' data or link the data with identifying information.
The data link is the only way to ensure participants have consented to have their data utilized in the research.

e. Where will code lists be stored? (Building, room number?)
Auburn University Miller Hall Room 142.

f. Will data collected as "confidential" be recorded and analyzed as "anonymous"? ☑ Yes ☐ No
(If you will maintain identifiable data, protections should have been described in #15.)

g. Describe how and where the data will be stored (e.g., hard copy, audio cassette, electronic data, etc.), and how the location where data is stored will be secured in your absence. For electronic data, describe security. If applicable, state specifically where any IRB-approved and participant-signed consent documents will be kept on campus for 3 years after the study ends.

Stored as a hard copy in a locked file cabinet in Room 142 Miller Hall AU until January 2010 and May 2011 then transferred to room 212 Miller Hall AU to a locked file cabinet.

h. Who will have access to participants' data?
(The faculty advisor should have full access and be able to produce the data in the case of a federal or institutional audit.)

Teresa Gore, Karol Renfroe at AUSON and Dr. Kim Leighton at BryanLGH College of Health Sciences.

i. When is the latest date that confidential data will be retained? (Check here if only anonymous data will be retained. ☐)

May 2014

j. How will the confidential data be destroyed? *(NOTE: Data recorded and analyzed as "anonymous" may be retained indefinitely.)*

The code list and hard copies of the data will be destroyed by shredding

AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS

REQUEST for PROTOCOL RENEWAL

For Information or help completing this form, contact: **THE OFFICE OF HUMAN SUBJECTS RESEARCH**, 115 Ramsay Hall
Phone: 334-844-5966 **e-mail:** hsubjec@auburn.edu **Web Address:** http://www.auburn.edu/research/vpr/ohs/index.htm

Complete this form using Adobe Acrobat Writer (versions 5.0 and greater). Hand written forms will not be accepted.

Received
FEB 07 2013
Research Compliance

1. **Protocol Number:** 12-057 EP 1202
2. **Original IRB Approval Dates:** From: 2/19/12 To: 2/18/13
3. **Requested ONE YEAR MAXIMUM Renewal Period:** From: 2/18/13 To: 2/17/14
4. **PROJECT TITLE:** Simulated Clinical Experiences versus Traditional Clinical Experiences Across the Curriculum: Effect on Undergraduate Students' Perception of Preparedness for Human Patient Care and Learning Needs
5. Teresa Gore | Assoc Clin Prof | Nursing | 4-7360 | goreter@auburn.edu
   PRINCIPAL INVESTIGATOR | TITLE | DEPT | PHONE | AU E-MAIL
   PI SIGNATURE | 212 Miller Hall MAILING ADDRESS | ALTERNATE E-MAIL

   FACULTY ADVISOR | SIGNATURE | DEPT | PHONE | AU E-MAIL

   Name of Current Department Head: Gregg Newschwander **AU E-MAIL:** gen0002
6. **Current External Funding Agency:** none
7. **List any contractors, sub-contractors, or other entities or IRBs associated with this project:**
8. **Briefly list** *(numbered or bulleted)* **the activities that occurred over the past year, particularly those that involved participants.**

Simulation has been conducted across the curriculum for every clinical course. The Pilot Data manuscript is currently under review for publication. Participants have included Teresa Gore, Bonnie Sanderson, Karol Renfroe, Constance Hendricks, and Francine Parker.

The Auburn University Institutional Review Board has approved this document for use from 2/13/13 to 2/18/14 Protocol # 12-057 EP 1202

9. **Explain why you are requesting additional time to complete this research project.**

Simulation participation is ongoing in the School of Nursing for every clinical course. Higher number of participants are needed for additional publication, therefore, more time is required for the IRB. Much of the research in simulation has been conducted in smaller cohorts of students with small sample size. Extension of this IRB could allow a greater number of students to participate.

10. **Do you plan to make any changes in your protocol if the renewal request is approved?**
(e.g., research design, methodology, participant characteristics, authorized number of participants, etc.)

☑ **NO** ☐ **YES** (If "yes", please complete and attach the "REQUEST for PROTOCOL MODIFICATION" form. The IRB will review both requests at the same time.)

11. **PARTICIPANT INFORMATION**

a. **How many individuals have actually participated in this research?** 152
If retrospective, how many files or records were accessed? N/A

b. **Were there any adverse events, unexpected difficulties or unexpected benefits with the approved procedures?**

☑ **NO** ☐ **YES** (If YES, please explain)

d. **How many participants have withdrawn from the study?** _____ ☑ **None or Not Applicable.**
NOTE: If any participants withdrew from the study, please explain.

e. **How many <u>new</u> participants do you plan to recruit during the renewal period?** 120 ☐ **None / NA**

f. **During the renewal period, will you re-contact any individual that has already participated in your research project?**
☑ **None / NA**

☐ **NO** ☐ **YES** If "YES", please explain reasons for re-contacting participants.
(If "YES" and the procedure to re-contact has not been previously approved, please complete and attach a "REQUEST for PROTOCOL MODIFICATION" form. The IRB will review both requests at the same time.)

12. PROTECTION OF DATA

a. Is the data being collected, stored and protected as previously approved by the IRB?

☐ NO (If "NO", explain) ☑ YES

b. Are there any changes in the "key research personnel" that have access to participants or data?
Attach CITI proof of completion for all new key personnel.

☐ NO ☑ YES (If "YES", identify each individual and explain the reason(s) for each change.)

Kim Leighton is no longer on this research project. She was the designer of the instrument used for the project and has given permission for continued use of the instrument.

c. What is the latest date (month and year) you now expect all identifiable data to be destroyed?
(Identifiable data includes videotapes, photographs, code lists, etc.)

DATE: February 2017 ☐ Not Applicable – no identifiable data has been or will be colleted.

11. Attach a copy of all "stamped" IRB-approved documents used during the previous year.
(Information letters, Informed Consents, Parental Permissions, etc.).

12. If you plan to recruit participants, or collect human subject data during the renewal period, attach a new copy of the consent document or information letter you will use during the extension.

(*Be sure to review the OHSR website for current consent document guidelines and updated contact information:* http://www.auburn.edu/research/vpr/ohs/sample.htm .)

PLEASE NOTE: If you do not plan to collect additional data and/or you do not have access to any identifiable data (including code lists, etc.) you may be able to file a "FINAL REPORT" for this project. Contact the Office of Human Subjects Research for more information.

When complete, submit hard copy with signatures to the Office of Human Subjects Research, 115 Ramsay Hall, Auburn University, AL 36849

APPENDIX C

Informed Consent Letter

AUBURN UNIVERSITY

SCHOOL OF NURSING

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMED CONSENT
for a Research Study entitled
"Higher levels of Fidelity versus Low Fidelity Patient Simulation's Effect on Student Perception of Preparedness for Human Patient Care"

You are invited to participate in a research study to evaluate the relationship between higher levels of fidelity versus low-fidelity during mock hospital unit simulation and students' perception of preparedness for human patient care. The study is being conducted by Dr. Teresa Gore and Ms. Karol Renfroe, Auburn University School of Nursing and Dr. Kim Leighton, Bryan LGH College of Health Science. You were selected as a possible participant because you are enrolled in the clinical portion of NURS 3130 and 3141 at AUSON and are age 19 or older.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to complete the *METI Simulation Effectiveness Tool (SET)* prior to human patient contact after Mock Hospital Unit Simulation and repeat the *SET* and the *Clinical Learning Environment Comparison Survey* after four weeks of human patient care. These evaluation tools are required of all students, but by consenting, your confidential data can be used for research. Your total time commitment will be approximately 30 minutes.

Are there any risks or discomforts? The risks associated with participating in this study are breach of confidentiality and coercion. To minimize these risks, we will have Dr. Bonnie Sanderson obtain the consent and retain the information until after the study is complete. She will compile the data from consenting students and only present this to the members of this team. You will use the alphabetical letter of your clinical rotation group and then the last four numbers of your student ID as your identifier. The list with your identifier and name will be destroyed by shredding hard copy as soon as data that can be used is linked for the research.

Are there any benefits to yourself or others? If you participate in this study, you can expect to improve your critical thinking, clinical judgment, and decrease your anxiety regarding human patient care. We cannot promise you that you will receive any or all of the benefits described.

Participant's initials _____

107 Miller Hall, Auburn, AL 36849-5505; Telephone: 334-844-5665; Fax: 334-844-4177
www.auburn.edu

Will you receive compensation for participating? No
Are there any costs? If you decide to participate, there will not be any costs to you.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or Auburn University School of Nursing.

Your privacy will be protected. Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be used for publication in a professional journal, and/or presented at a professional meeting. If you consent, no information that could identify you will be used.

If you have questions about this study, *please ask them now or* contact Dr. Teresa Gore at 844-7360 or Karol Renfroe at 844-6705. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date	Investigator obtaining consent Date
Printed Name	Printed Name
	Kim Leighton 10/17/10
Co-Investigator Date	Co-Investigator Date
	Kim Leighton
Printed Name	Printed Name

The Auburn University Institutional Review Board has approved this document for use from 10/27/10 to 10/26/11
Protocol # 10-308 EP 1010

Rev.6/07

AUBURN UNIVERSITY

SCHOOL OF NURSING

The Auburn University Institutional Review Board has approved this document for use from 2/19/12 to 2/18/13 Protocol # 12-057 EP1202

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMED CONSENT
for a Research Study entitled
"Simulated Clinical Experiences Versus Traditional Clinical Experiences Across the Curriculum: Effect on Students' Perception of Preparedness for Human Patient Care and Learning Needs"

You are invited to participate in a research study to evaluate simulated clinical experiences versus traditional clinical experiences across the curriculum at Auburn University School of Nursing to evaluated the effect of the experiences on your perception of preparedness for human patient care and learning needs. The study is being conducted by Dr. Teresa Gore, Ms. Karol Renfroe, Dr. Bonnie Sanderson, Dr. Constance Hendricks, and Dr. Francine Parker, Auburn University School of Nursing and Dr. Kim Leighton, Bryan LGH College of Health Science. You were selected as a possible participant because you are enrolled in the clinical portion of NURS ~~3130~~ 3230 and ~~3141~~ 3231 at AUSON and are age 19 or older.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to complete the *Leighton Clinical Learning Environment Comparison Survey (L-CLECS)* after experiencing the simulated clinical experience and traditional clinical experience. The simulated clinical experience, traditional clinical experience and the *L-CLECS* are required of all students, but by consenting, your confidential data can be used for research. Your total time commitment will be approximately 30 minutes.

Are there any risks or discomforts? The risks associated with participating in this study are breach of confidentiality and coercion. To minimize these risks, we will have Dr. Bonnie Sanderson obtain the consent and retain the information until after the study is complete. She will compile the data from consenting students and only present this to the members of this team. You will use a self assigned special identifier as your code which consists of a 4-6 character code as your identifier. The list with your identifier and name will be destroyed by shredding hard copy as soon as data that can be used is linked for the research. Your data will be anonymous.

Are there any benefits to yourself or others? If you participate in this study, you can expect to improve your critical thinking, clinical judgment, and decrease your anxiety regarding human patient care. We cannot promise you that you will receive any or all of the benefits described.

Participant's initials _____

107 Miller Hall, Auburn, AL 36849-5505; Telephone: 334-844-5665; Fax: 334-844-4177
www.auburn.edu

Will you receive compensation for participating? No
Are there any costs? If you decide to participate, there will not be any costs to you.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or Auburn University School of Nursing.

Your privacy will be protected. Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be for publication in a professional journal, and/or presented at a professional meeting.

If you have questions about this study, *please ask them now or* contact Dr. Teresa Gore at 844-7360 or Karol Renfroe at 844-6705. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date

Printed Name

Investigator Date

Teresa Gore
Printed Name

Co-Investigator Date

Constance S. Hendricks
Printed Name

Kim Leighton 2/1/12
Co-Investigator Date

Kim Leighton
Printed Name

Bonnie Sanderson 2/1/12
Co-Investigator obtaining consent Date

Bonnie Sanderson
Printed Name

Francine Parker 2/1/12
Co-Investigator Date

FRANCINE PARKER
Printed Name

Karol C. Renfroe 2/1/2012
Co-Investigator Date

KAROL C. RENFROE
Printed Name

The Auburn University Institutional Review Board has approved this document for use from 2/19/12 to 2/18/13
Protocol # 12-057 EP 1202

Page 2 of 2

Rev.6/07

AUBURN UNIVERSITY

SCHOOL OF NURSING

2/13/13 2/18/14
Protocol # 12-057EP1202

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMED CONSENT
for a Research Study entitled
"Simulated Clinical Experiences Versus Traditional Clinical Experiences Across the Curriculum: Effect on Students' Perception of Preparedness for Human Patient Care and Learning Needs"

You are invited to participate in a research study to evaluate simulated clinical experiences versus traditional clinical experiences across the curriculum at Auburn University School of Nursing to evaluate the effect of the experiences on your perception of preparedness for human patient care and learning needs. The study is being conducted by Dr. Teresa Gore, Ms. Karol Renfroe, Dr. Bonnie Sanderson, Dr. Constance Hendricks, and Dr. Francine Parker, Auburn University School of Nursing. You were selected as a possible participant because you are enrolled in the clinical portion of a NURS course at AUSON and are age 19 or older.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to complete the *Leighton Clinical Learning Environment Comparison Survey (L-CLECS)* after experiencing the simulated clinical experience and traditional clinical experience. The simulated clinical experience, traditional clinical experience and the *L-CLECS* are required of all students, but by consenting, your confidential data can be used for research. Your total time commitment will be approximately 30 minutes.

Are there any risks or discomforts? The risks associated with participating in this study are breach of confidentiality and coercion. To minimize these risks, we will have Dr. Bonnie Sanderson obtain the consent and retain the information until after the study is complete. She will compile the data from consenting students and only present this to the members of this team. You will use a self assigned special identifier as your code which consists of a 4-6 character code as your identifier. The list with your identifier and name will be destroyed by shredding hard copy as soon as data that can be used is linked for the research. Your data will be anonymous.
Are there any benefits to yourself or others? If you participate in this study, you can expect to improve your critical thinking, clinical judgment, and decrease your anxiety regarding human patient care. We cannot promise you that you will receive any or all of the benefits described.

Participant's initials _____ Page 1 of 2

107 Miller Hall, Auburn, AL 36849-5505; Telephone: 334-844-5665; Fax: 334-844-4177
www.auburn.edu

Will you receive compensation for participating? No
Are there any costs? If you decide to participate, there will not be any costs to you.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or Auburn University School of Nursing.

Your privacy will be protected. Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be for publication in a professional journal, and/or presented at a professional meeting.

If you have questions about this study, *please ask them now or* contact Dr. Teresa Gore at 844-7360 or Karol Renfroe at 844-6705. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date	Co-Investigator obtaining consent Date
Printed Name	Bonnie Sanderson Printed Name
Investigator Date	Francine Parker 3/6/13 Co-Investigator Date
Teresa Gore Printed Name	FRANCINE PARKER Printed Name
Karol C. Renfroe 3/6/2013 Co-Investigator Date	Co-Investigator Date
Karol Renfroe Printed Name	Printed Name
Co-Investigator Date	
Constance Hendricks Printed Name	

The Auburn University Institutional Review Board has approved this document for use from 2/13/13 to 2/18/14
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Rev.6/07

AUBURN UNIVERSITY

SCHOOL OF NURSING

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for a Research Study entitled
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Are there any risks or discomforts? The risks associated with participating in this study are breach of confidentiality and coercion. To minimize these risks, we will have Dr. Bonnie Sanderson obtain the consent and retain the information until after the study is complete. She will compile the data from consenting students and only present this to the members of this team. You will use a self assigned special identifier as your code which consists of a 4-6 character code as your identifier. The list with your identifier and name will be destroyed by shredding hard copy as soon as data that can be used is linked for the research. Your data will be anonymous.
Are there any benefits to yourself or others? If you participate in this study, you can expect to improve your critical thinking, clinical judgment, and decrease your anxiety regarding human patient care. We cannot promise you that you will receive any or all of the benefits described.

Participant's initials _____ Page 1 of 2

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www.auburn.edu

Will you receive compensation for participating? No
Are there any costs? If you decide to participate, there will not be any costs to you.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or Auburn University School of Nursing.

Your privacy will be protected. Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be for publication in a professional journal, and/or presented at a professional meeting.

If you have questions about this study, *please ask them now or* contact Dr. Teresa Gore at 844-7360 or Karol Renfroe at 844-6705. A copy of this document will be given to you to keep.

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HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature	Date	Co-Investigator obtaining consent	Date
Printed Name		Printed Name	
Investigator	Date	Co-Investigator	Date
Printed Name		Printed Name	
Co-Investigator	Date	Co-Investigator	Date
Printed Name		Printed Name	
Co-Investigator	Date		
Printed Name			

The Auburn University Institutional Review Board has approved this document for use from 2/14/14 to 2/18/15
Protocol # 12-057 EP 1202

Rev 6/07

APPENDIX D

Student Information Prior to Simulation for First Semester

Each student will participate in a Mock Hospital Scenario. The purpose of this is to prepare you to care for patients, therapeutic communication, learn the expectations and practice time management for clinical rotations. You will report to the AUSON lab for a 3-hour shift instead of the hospital on one of your shifts to provide care in a simulated hospital environment. Come prepared with your uniform, equipment, PDA, etc. The dates are on the calendar. You will only attend one of these. Whenever possible, your clinical instructor will be present for this scenario. One problem will be built into each scenario. The goal of this activity is to prepare you to provide safe quality care to your patient and develop critical thinking skills. You will have pre and post simulation assignments that will be listed on Canvas

Simulated Clinical Experiences

Simulated clinical experiences will provide you with the opportunity to practice patient care in a safe and controlled environment. AUSON faculty does not expect you to know everything. Simulation is a learning opportunity to develop critical thinking and professional nursing skills. Simulation is usually defined related to the fidelity. Fidelity of the simulated clinical experience refers to the believability or the degree to which a simulated experiences approaches reality, as the fidelity increases realism may increases. The level of fidelity is determined by the environment as well as the tools / resources used. Simulation can occur with an individual or as a team. In the Learning Resource and Simulation Lab you will experience all levels.

Low Fidelity: regular static manikins, task trainers (IV arms, foley catheter models, etc).

Medium Fidelity: Vital Sim Manikin has heart and lung sounds but the chest does not rise with respirations. We can simulate patient talking through speakers and microphones

High Fidelity: These manikins have pulses, heart and lung sounds, chest rises and falls with respirations and a monitor can show the heart rate, blood pressure, and other information.

The simulated clinical experience will focus on objectives or outcomes the student should obtain and incorporates various domains of learning such as:

Cognitive: mental skills (*Knowledge*)

Psychomotor: manual or physical skills (*Skills*)

Affective: growth in feelings or emotional areas (*Attitude*)

Simulation can be divided into several phases.

Pre-simulation exercises: reading, videos, assignments prior to arrival for the simulated clinical experience

Pre-briefing: immediately prior to the beginning of the clinical experience for the facilitator to set the scene, expectations, and answer questions.

Simulated clinical experience: the actual scenario is performed. The simulated clinical experience will be facilitated by a faculty member or clinical instructor.

Debriefing: Activity that follows a simulation experience led by a facilitator wherein feedback is provided on the simulation participants' performance while positive aspects of the completed simulation are discussed and reflective thinking encouraged. *Guided Reflection* is a process used by the facilitator during debriefing that reinforces the critical aspects of the experience and encourages insightful learning allowing the student to assimilate theory, practice, and research to influence future actions.

Evaluation/Assessment: Prior to beginning the clinical simulated experience, you should be aware of the grading or evaluation of this experience.

- *Formative Assessment* **–**focus is on the student's progress towards goal attainment. Constructive feedback is given so the student can continue to improve.
- *Summative Evaluation* - Evaluation occurring at the end of a learning period where participants are provided feedback about their achievement of outcome criteria. A process for determining the competence of a participant engaged in healthcare activity. The assessment of student's ability to achieve the criteria and is usually associated with an assigned grade, satisfactory, or unsatisfactory.

Professional Integrity and Confidentiality

Professional integrity including confidentiality of the performances, scenario content, and experience is expected to be upheld. Professional integrity is expected for all components and participants in the simulation environment. Failure of the participants to maintain professional integrity related to simulation could undermine the benefits of the simulated clinical experience. Privileged information of any kind can bias an individual's performance and interfere with the group's dynamics thereby interfering with learning outcomes. Sharing of events and individual performances occurring during the simulation sessions with those not involved in the event may decrease the safe environment of the simulation setting. Sharing of events and correct action in the simulation with those not involved in the event may negatively alter future participants learning outcomes. Failure to comply with this is an act of academic dishonesty. Please refer to Student Handbook and the academic honesty section of this syllabus. Each student will sign a contract to uphold Professional Integrity and Confidentiality for Simulated Clinical Experiences.

_____

APPENDIX E

Template for First Semester Students Simulation as Initial Patient Care

Objectives for Mock Hospital Scenario 5 Lisa Rae:

1. Understand the components and requirements of an inpatient clinical day
2. Utilize therapeutic communication
3. Identify and implement fall precautions and safety concerns
4. Recognize skin integrity concerns and implement appropriate interventions
5. Prioritize and implement nursing care to include documentation

Pre-Simulation Exercises: ***Fundamental Simulation Learning System (SLS) Scenario 5***

1. Complete and print off Pre-Simulation Exercises for Scenario 5 of Fundamental Simulation Learning System
2. Turn in the Pre-Simulation Exercises at Mock Hospital

Post-Simulation Exercises:

1. Complete a Nursing Process Flowsheet with your partner on the highest priority patient problem
2. Submit a Reflective Journal to include:
   - What you learned
   - How this experience made you feel
   - How do you think this experience will influence your nursing care in the future
   - List at least one positive intervention or interaction you did during the simulation
   - Is there anything you would like to have changed or performed differently in the simulation

Evaluation of Learner: Clinical Learning Environments Comparison Survey (CLECS)
Evaluation Tool of Simulation: METI SET Tool
Facilitation: Partial Instructor Driven with multiple facilitators (course leader, clinical associate, course faculty involved in the scenario. Debriefing to occur in Nursing Resource Lab
Minimal Number of Participants: 1 **Maximum Number of Participants:** 3
Scenario Time: Prebrief 1 hour Simulation 1 hour
Debriefing Time: 1 hour **Video Recording:** Depends on research conducted
Will recording be retained: No
Designers: Evolve SLS Fundamentals with Modifications by researcher and lab coordinator for use in NURS 3141
Validation and Peer Review: First semester nursing school faculty

State #1	Interventions	State #2	Interventions	State #3
Vital Signs: T-98.2 BP- 92/74 HR- 86 RR-18 O2 Sat 98% RA Heart Sounds-	• Conducts initial focused assessment • Conducts fall risk	"I am hurting a little, but I can't take that medicine, it makes me too loopy and I am fearful of	• Conduct pain and assessment and follow-up • Administer	Vital Signs: T-98.5 BP- 98/72 HR- 80 RR-18 O2 Sat 98% RA

Regular Breath Sounds-clear Abdominal Sounds-present Pulses- +2 Pain- 3/10 Bed in high position with siderails down and brakes not locked No socks **Patient wanting up-**incontinent of urine. "I am so sorry. I just couldn't get up in time and I had an accident. I am sorry I knocked the glass over, I was trying to get up. Another nurse got upset with me when I tried to get and I promised I wouldn't do it again. Now look what happened." "Thank you for caring for me today. I usually do everything for myself. I don't want to be a bother." "My bottom feels sore. I hope that being wet didn't	assessment • Implements fall precautions • Conducts skin assessment paying special attention to sacrum and rt hip • Implements pressure ulcer prevention measures • Performs hygiene and linen change • Uses therapeutic communication • Treats patient with dignity and respects • Encourages client to participate in care • SBARR with wound nurse regarding skin • Documents assessment	falling again. My pain level is about a 5/10. Do I have anything else for pain?" "I can't believe I took 2 blood pressure pills instead of one and it made me fall. They brought me to the hospital after my fall this morning." **<u>Responses for questions:</u>** "My birthday is November 24." "I don't have any allergies." "Since I retired, I don't keep up with the day or date." "I'm still a little woozy and dizzy, but I am better than I was."	acetaminophen or SBARR communication with MD to change medication to po • Documents appropriately	• "My pain is better. It is about a 2/10 now. • "Thank you for everything you have done for me today. You have really made me feel better." • "Good luck with the rest of your school."

cause a rash or something." " I usually don't have any trouble getting to the bathroom. I wear those briefs sometimes when I go out just in case. I just don't know what is going on making me have an accident." "Oh please be careful when you move me. My rt hip is very sore from my tumble this morning. They told me it is not broken, but it still hurts. My pain level is a 3/10. No I don't need any medication right now. I am OK."				
Props	**Props**	**Props**	**Props**	**Props**
Female manikin with graying hair wig (static or any level fidelity manikin) If static, use walkie talkie or speakers with microphones for communication IV 18 gauge: NS at				

75 cc/hr (Rt AC) Urinary incontinence pad-soiled with urine Non-skid socks Clutter on floor Incontinence care supplies Hygiene and linen supplies Moulage-redness over sacral area and hematoma on rt hip-warm Call light Medications: Hydromorphone 1 mg/ml Acetaminophen 500 mg tablets Computer for charting with SLS				

Debriefing*: (Ask at least one from each section)*

Aesthetic Questions:

"I would like each of you to talk to me about the problem(s) Lisa was experiencing today.
"What was your main objective during this simulation?"

Personal Questions:

"How did this scenario make you feel?
"What made you chose the actions/interventions/focus you chose for Lisa?"

Empirical Questions:

"I would like for each of you to talk with me about the knowledge, skills, attitudes (KSA) and previous experiences that provided you the ability to provide evidence-based care to Lisa."

Ethical Question:

"Talk to me about how your personal beliefs and values influenced the care provided to Lisa.

Reflection:

"Will each of you tell me how you knew what to do for a patient with hypotension, mechanical fall, and currently in pain and why?
If we could re-do this scenario now, what would you change and why?
How will you use this in your professional practice?"

Objectives for Scenario 7 Carl Rogers :

- Understand the components and requirements of an inpatient clinical day
- Utilize therapeutic communication
- Identify and implement plan of care for a diabetic patient
- Recognize skin integrity concerns and implement appropriate interventions including dressing changes
- Prioritize and implement nursing care to include documentation

Pre-Simulation Exercises: ***Fundamental Simulation Learning System (SLS) Scenario 7***

1. Complete and print off Pre-Simulation Exercises for Scenario 7 of Fundamental Simulation Learning System
2. Turn in the Pre-Simulation Exercises at Mock Hospital

Post-Simulation Exercises:

1. Complete a Nursing Process Flowsheet with your partner on the highest priority patient problem
2. Submit a Reflective Journal to include:
   - What you learned
   - How this experience made you feel
   - How do you think this experience will influence your nursing care in the future
   - List at least one positive intervention or interaction you did during the simulation
   - Is there anything you would like to have changed or performed differently in the simulation

Evaluation of Learner: Clinical Learning Environments Comparison Survey (CLECS)
Evaluation Tool of Simulation: METI SET Tool
Facilitation: Partial Instructor Driven with multiple facilitators (course leader, clinical associate, course faculty involved in the scenario. Debriefing to occur in Nursing Resource Lab
Minimal Number of Participants: 1 **Maximum Number of Participants:** 3
Scenario Time: Prebrief 1 hour Simulation 1.5 hours
Debriefing Time: 1.5 hours **Video Recording:** Depends on research conducted
Will recording be retained: No
Designers: Evolve SLS Fundamentals with Modifications by researcher and lab coordinator for use in NURS 3141
Validation and Peer Review: First semester nursing school faculty

State #1	Interventions	State #2	Interventions	State #3
Vital Signs: T-98.6 BP- 128/74 HR- 80 RR-14 O2 Sat 99% RA	• Conducts initial focused assessment • Educate on diabetes	"I am ready for my dressing change. Can I have something for pain before you do the dressing	• Continue to educate on diabetes and circulation and wound management	Vital Signs: T-98.6 BP- 122/76 HR- 80 RR-14 O2 Sat 99% RA

Heart Sounds- Regular Breath Sounds- clear Abdominal Sounds- present Pulses- +2 upper and diminished lower (+1) Pain- 1/10 "My dressing fell off right now but I will let you know when I want you to do my dressing change. I don't know who I got the wound on my heel or why it got so ugly so quickly." "I sometimes have numbness and tingling in my feet." "My birthday is March 15." "I don't have any allergies."	• Conducts skin assessment paying special attention to rt heel • Implements pressure ulcer prevention measures • Performs hygiene and linen change • Uses therapeutic communication • Treats patient with dignity and respects • Encourages client to participate in care • SBARR with wound nurse regarding skin • Documents assessment • Administer Lispro insulin 11 units: 5 units scheduled and 6 units	change? Right now my pain level is a 3/10 but when you do the dressing it will go up to about a 5-6/10." He continues to express curiosity regarding the nurse's wound assessment. "What do you think about my heel? It looks pretty bad, huh?" "It doesn't seem to be getting better. Why do you think that is?" "I tried soaking it, but it didn't get better." "How do you think it looks? How did it get so bad?" "I first noticed this sore 3 weeks ago. I'm not sure if it has been there longer." "I.ve got some numbness in my foot. I don't want an infection and have to have my foot amputated." **If dressing change not**	prior to medication administration • Consults with Wounds/Diabetes Nurse • Conduct pain and assessment and follow-up • Administer Morphine or uses SBARR to consult with MD for PO medications. • Documents appropriately • Performs the dressing change. • May do an extra blood sugar- 199 no treatment because extra blood sugar tested not scheduled	• "My pain is better. It is about a 1/10 now. • "Thank you for everything you have done for me today. You have really made me feel better." • "Good luck with the rest of your school."

"I want my insulin shot in my stomach." Blood sugar- 290 Mr. Rogers expresses concern regarding the condition of the wound and verbalizes symptoms of hyperglycemia. "I don't know why my sugar is so high. I have been doing everything I am suppose to do."	• sliding scale • Candy removed from patient's room	**completed.** "I'm concerned about my heel getting infected and having to have an amputation. The doctor told me if I don't keep my blood sugars down that could happen." • "My doctor put me in the hospital to have this wound properly cleaned and taken care of. I could have done this at home." **If insulin not given-** C/O S/S Hyperglycemia: Thirsty, headache		
Props	**Props**	**Props**	**Props**	**Props**
Male manikin with graying hair wig (static or any level fidelity manikin) If static, use walkie talkie or speakers				

with microphones for communication IV 20 gauge: SL (Rt forearm) HOB elevated 45 degrees Hygiene and linen supplies. Extra towels and pillows. Elevate rt foot off bed Moulage- stage II ulcer on rt heel. No dressing on pt Wound supplies: Gauze Bottle of NS Kerlix Tape Call light Medications Insulin-NPH Lispro-**Distraction** Glargine-**Distraction** Morphine 2 mg IV Computer for charting				

with SLS ID band Candy in the bed				

Debriefing*: (Ask at least one from each section)*

Aesthetic Questions:

"I would like each of you to talk to me about the problem(s) Carl was experiencing today.
"What was your main objective during this simulation?"

Personal Questions:

"How did this scenario make you feel?
"What made you chose the actions/interventions/focus you chose for Carl?"

Empirical Questions:

"I would like for each of you to talk with me about the knowledge, skills, attitudes (KSA) and previous experiences that provided you the ability to provide evidence-based care to Carl."

Ethical Question:

"Talk to me about how your personal beliefs and values influenced the care provided to Carl.

Reflection:

"Will each of you tell me how you knew what to do for a non-compliant diabetic patient with high cholesterol, HTN, and stage II foot ulcer and why?
If we could re-do this scenario now, what would you change and why?
How will you use this in your professional practice?"

Objectives for Scenario 8 Maurice Arviso:

- Understand the components and requirements of an inpatient clinical day
- Utilize therapeutic communication
- Identify and implement plan of care for a patient with pneumonia
- Recognize S/S hypoxia with O2 accidentally disconnected
- Prioritize and implement nursing care to include documentation

Pre-Simulation Exercises: *Fundamental Simulation Learning System (SLS) Scenario 8*

1. Complete and print off Pre-Simulation Exercises for Scenario 8 of Fundamental Simulation Learning System
2. Turn in the Pre-Simulation Exercises at Mock Hospital

Post-Simulation Exercises:

1. Complete a Nursing Process Flowsheet with your partner on the highest priority patient problem
2. Submit a Reflective Journal to include:

- What you learned
- How this experience made you feel
- How do you think this experience will influence your nursing care in the future
- List at least one positive intervention or interaction you did during the simulation
- Is there anything you would like to have changed or performed differently in the simulation
- Is there anything you would like to have changed or performed differently in the simulation

Evaluation of Learner: Clinical Learning Environments Comparison Survey (CLECS)
Evaluation Tool of Simulation: METI SET Tool
Facilitation: Partial Instructor Driven with multiple facilitators (course leader, clinical associate, course faculty involved in the scenario. Debriefing to occur in Nursing Resource Lab
Minimal Number of Participants: 1 **Maximum Number of Participants:** 3
Scenario Time: Prebrief 1 hour Simulation 1.5 hours
Debriefing Time: 1.5 hours **Video Recording:** Depends on research conducted
Will recording be retained: No
Designers: Evolve SLS Fundamentals with Modifications by researcher and lab coordinator for use in NURS 3141
Validation and Peer Review: First semester nursing school faculty

State #1	Interventions	State #2	Interventions	State #3
Vital Signs: T- 100.6 BP- 132/72 HR- 100 RR- 28 O2 Sat 88% (O2 is off accidentally) **Transitioning until O2 discovered** T- 100.6 BP- 142/80 HR 108 RR 30 O2 sat 86% Heart Sounds-normal Breath Sounds-crackles bilaterally	• Conducts initial focused assessment • Elevates HOB, places O2 tubing back into flow meter, and increases O2 to 4 L/min NC • Uses therapeutic communica-tion • Treats patient with dignity and	If O2 reconnected and HOB elevated-O2 sat better to 94 and SOB resolved. T- 100.6 BP- 126/70 HR 98 RR 24 **O2 sat 89% 2 L/min** "I feel a little better, but I still can't catch my breath." **O2 sat 91% 3 L/min** "I feel a little better, but I still	• O2 at appropriate level • Reassures patient • Focused respiratory assessment • Performs hygiene and linen change and SOB better • SBARR with respiratory therapist regarding breathing • Educates and	• "My breathing is better. I don't feel short of breath." • "Thank you for everything you have done for me today. You have really made me feel better." • "Good luck with the rest of your school."

Abdominal Sounds-present Pulses- +2 Pain- Short of Breath Dsypneic only able to speak in 4-5 word sentences. " I used the urinal…. and tried to hang it…… back up on the siderail…..It spilled on the…..bed & floor……..I am sooo sorry….I am embarrassed…. " I feel so weak….out of breath……. **O2 is disconnected from the wall** Coughing spells "My birthday is February 22." "I don't have any allergies."	respects • Encourages client to participate in care • Documents assessment	can't catch my breath." **O2 sat 94% 4 L/min** "I can breathe much better now." **If O2 not reconnected and HOB not elevated:** Oxygen 2 L/min via nasal cannula: O2 Sat = 88% "I feel a little better with the oxygen on (deep breath), but it's still so hard to breathe (deep breath)." Oxygen 3 L/min via nasal cannula: O2 Sat = 90% "That oxygen is helping some (deep breath), but it's still so hard to breathe (deep breath)." Oxygen 4 L/min via nasal cannula: O2 Sat = 91% "I feel better, but I still can't really catch my breath (deep breath). Is there anything else you can do to help me	has pt perform ICS	Vital Signs T- 100.6 BP- 128/74 HR 93 RR 24 O2 Sat 95%

		breathe easier (deep breath)?." "This is so hard for me. I have always been very independent. I can't deal with this." "I don't want to be a burden on anyone." Once breathing better change linen		
Props	**Props**	**Props**	**Props**	**Props**
Male manikin with graying hair wig VitalSim, SimMan, or 3G IV 22 gauge: D5LR (Rt hand) @75 cc/hr HOB elevated 45 degrees Hygiene and linen supplies. NC at 2L/min Call light Medications: Acetaminophen ASA Urinal with simulated urine Simulated sputum in emesis basin Computer for charting with SLS ID band				

Debriefing*: (Ask at least one from each section)*

Aesthetic Questions:
"I would like each of you to talk to me about the problem(s) Maurice was experiencing today.
"What was your main objective during this simulation?"
Personal Questions:
"How did this scenario make you feel?
"What made you chose the actions/interventions/focus you chose for Maurice?"
Empirical Questions:
"I would like for each of you to talk with me about the knowledge, skills, attitudes (KSA) and previous experiences that provided you the ability to provide evidence-based care to Maurice."
Ethical Question:
"Talk to me about how your personal beliefs and values influenced the care provided to Maurice.
Reflection:
"Will each of you tell me how you knew what to do for a patient with pneumonia, O2 and SOB and why?
If we could re-do this scenario now, what would you change and why?
How will you use this in your professional practice?"

Objectives for Scenario 10 Boyd Dubois:

1. Understand the components and requirements of an inpatient clinical day
2. Utilize therapeutic communication
3. Identify and implement plan of care for a post-operative hip replacement patient
4. Demonstrate effective pain management and proper use of patient identifiers
5. Prioritize and implement nursing care to include documentation

Pre-Simulation Exercises: ***Fundamental Simulation Learning System (SLS) Scenario 10***

1. Complete and print off Pre-Simulation Exercises for Scenario 10 of Fundamental Simulation Learning System
2. Turn in the Pre-Simulation Exercises at Mock Hospital

Post-Simulation Exercises:

- Complete a Nursing Process Flowsheet with your partner on the highest priority patient problem
- Submit a Reflective Journal to include:
- What you learned
- How this experience made you feel
- How do you think this experience will influence your nursing care in the future
- List at least one positive intervention or interaction you did during the simulation
- Is there anything you would like to have changed or performed differently in the simulation
- Is there anything you would like to have changed or performed differently in the simulation

Evaluation of Learner: Clinical Learning Environments Comparison Survey (CLECS)
Evaluation Tool of Simulation: METI SET Tool
Facilitation: Partial Instructor Driven with multiple facilitators (course leader, clinical associate, course faculty involved in the scenario. Debriefing to occur in Nursing Resource Lab
Minimal Number of Participants: 1 **Maximum Number of Participants:** 3
Scenario Time: Prebrief 1 hour Simulation 1.5 hours
Debriefing Time: 1.5 hours **Video Recording:** Depends on research conducted
Will recording be retained: No
Designers: Evolve SLS Fundamentals with Modifications by researcher and lab coordinator for use in NURS 3141
Validation and Peer Review: First semester nursing school faculty

State #1	Interventions	State #2	Interventions	State #3
Vital Signs: T-100.4 BP- 136/78 HR- 84 RR-20 O2 Sat 93% RA Heart Sounds-Regular Breath Sounds-bibasilar crackles Abdominal Sounds-present Pulses- +2 Pain- 7/10 "Oh, I am in so much pain. I feel so helpless being strapped into this pillow thing between my legs." "My birthday is April 30." "I'm allergic to shellfish. I get hives." "I can hardly wait to get back on the golf	• Conducts initial focused assessment • Uses therapeutic communication • Treats patient with dignity and respects • Encourages client to participate in care • Documents assessment • Administers pain medication (IV Morphine) • Recognizes atelectasis and initiates TCDB, ICS and ensures SCD are in	Vital Signs: T-99.2 BP- 124/74 HR- 80 RR-12 O2 Sat 96% RA Heart Sounds-Regular Breath Sounds-bibasilar crackles Pain- 3/10 "The pain medication is working and I am feeling better now." "I think I am ready and can tolerate my bath now." **If no pain med or ICS:**	•Performs hygiene and linen change • Administers enoxaparin. •Explain anticoagulation therapy, SCDs, ICS •Reassesses pain level and effectiveness of interventions •Documents interventions and pt's tolerance	• "My pain is better. It is about a 2/10 now. • "Can I have a pain pill before you leave?" **May ask** • "Thank you for everything you have done for me today. You have really made me feel better." • "Good luck with the rest of your school."

course. This place is driving me nuts!" "When will I be able to get moving again?" "It has been a little difficult to breathe this morning" "Do you think that my breathing trouble is because I have not been out on the golf course exercising?"	use. • Recognizes Pt Identifiers are incorrect and changes armband.	T-101.2 BP- 150/88 HR- 110 RR-24 O2 Sat 90% RA Pain- 8/10 "Leave me alone. I am in pain. I just need to get better without you bothering me (shallow respirations)." "They did surgery on my leg, so why am I having trouble breathing?" "Do I blow air into the breathing thing?" "How does that breathing machine work? It feels like I just walked 18 holes of golf." "I know, the sooner I get moving, the sooner I will be back on the golf		

		course, right?"		
Props	**Props**	**Props**	**Props**	**Props**
Male manikin with graying hair wig (static or any level fidelity manikin) If static, use walkie talkie or speakers with microphones for communication IV 18 gauge: LR at 120 cc/hr (Rt forearm) Hygiene and linen supplies. Elevate rt foot off bed Rt hip incision with staples and drsg. Wound supplies: Gauze Tape Jackson-Pratt drain with simulated serosanguineous drainage IV medication syringes, blunt fill needle or needleless & saline flush syringes Abdominal Injection Pad				

Abductor pillow Sequential compression device boots and pump Call light Incentive spirometer **Medications:** Morphine for injection 2 mg/1 mL concentration in 1 mL vial Acetaminophen 500 mg tablets Enoxaparin 30 mg for injection (pre-filled syringe of 0.3 mL) Hydrocodone 5 mg/acetaminophen 500 mg tablets Levothyroxine 0.05 mg tablets (distracter) Pantoprazole 40 mg tablets (distracter) Computer for charting with SLS ID band incorrect & correct				

Debriefing*: (Ask at least one from each section)*

Aesthetic Questions:

"I would like each of you to talk to me about the problem(s) Boyd was experiencing today.

"What was your main objective during this simulation?"

Personal Questions:

"How did this scenario make you feel?"

"What made you chose the actions/interventions/focus you chose for Boyd?"

Empirical Questions:

"I would like for each of you to talk with me about the knowledge, skills, attitudes (KSA) and previous experiences that provided you the ability to provide evidence-based care to Boyd."

Ethical Question:

"Talk to me about how your personal beliefs and values influenced the care provided to Boyd".

Reflection:

"Will each of you tell me how you knew what to do for a S/P hip replacement patient with crackles bibasilar and in pain and why?
If we could re-do this scenario now, what would you change and why?
How will you use this in your professional practice?"

APPENDIX F

Student Information Prior to Simulation Fifth Semester

Simulated clinical experiences will provide you with the opportunity to practice patient care in a safe and controlled environment. Simulation is usually defined related to the fidelity. Fidelity of the simulated clinical experience refers to the believability or the degree to which a simulated experiences approaches reality. AMH is low-fidelity manikins (manikin will just lay in the bed) and medium level environmental fidelity (environment set up to replicate hospital).
Each student will have four patients. These are the same four patients from Mock Hospital your first semester.

AMH Phases

Pre-simulation exercises: reading, videos, assignments prior to arrival for the simulated clinical experience. It will be obvious if you do not prepare for this experience.

Pre-briefing: immediately prior to the beginning of the clinical experience for the facilitator to set the scene or give report, remind participants of expectations, and answer questions.

- The Charge Nurse will give the team report in Dr. _____'s office on these four patients using SBAR report sheets. The four patients will NOT have the same "problems" as they did in Mock Hospital.

Simulated clinical experience: the actual scenario is performed. This begins when you walk into the patient care area and after you meet your facilitator and patient care tech. (HINT: know these roles and their functions, including consultation, delegation.) Use your closed loop communication and team communication skills taught during SMART Training and practiced at the hospital's Patient Safety Institute.

- *Student Led*: The simulation is performed with minimum facilitation. Each student will be assigned a facilitator that will provide patient assessment details and communication cues when prompted by the student. The facilitator is not there to provide you will step-by-step instructions.
- Each patient will have a flip chart on his/her chest the facilitator will turn to provide additional information.
- REMEMBER: work together as a team to communicate, delegate, consult, and prioritize to provide the best evidence-based care to your team of patients.
- Objectives of AMH
    - Communicate with patients, team members, and facilitators in the room.
    - Provide safe quality care to your team of patients
    - Increase your critical thinking skills
    - Increase your prioritization skills
    - Help to develop leadership skills
- What will you perform and what will you state? Time is limited and we want you to get the most from this experience.
    - You will not have to perform the physical assessment-state what you will do and you will be given the information by the facilitator or the flip cards.
    - If medication needs to be given, you will determine which medication, how much, what route, and use ALL the rights for medication administration.
    - If you need to communicate with any team member, you will need to do this.

- You will not be able to do everything. You will need to determine what you need to do, what you can delegate, and what you can collaborate on.
- These are the limitations of the environment: O_2 flow rate will be marked with sticky dots on the flow meter, IV pumps will be labeled with rate and IVF with any additives, SCD leg wraps and pumps will be simulated, written MARs and relevant MD orders will be in the medication room.

- Time Frame/Limits
  - Prebrief and Report 15 minutes
  - Simulation Exercise 30 minutes
  - Debrief 15-30 minutes

Debriefing: will be led by a facilitator and feedback is provided on the participants' performance while positive aspects of the completed simulation are discussed and reflective thinking encouraged. Debriefing will occur next to Dr. _____'s office in the debriefing room. During debriefing g***uided reflection*** will occur. It is a process used by the facilitator that reinforces the critical aspects of the experience and encourages insightful learning allowing the student to assimilate theory, practice, and research to influence future actions. You will complete the METI Simulation Effectiveness Tool (SET) immediately following AMH to provide faculty with feedback on AMH. You will complete the Clinical Learning Environments Comparison Survey (CLECS) after completion of AMH and your leadership clinical experience.

Evaluation/Assessment: For AMH, the evaluation will be a formative assessment.

- *Formative Assessment* **–**focus is on the student's progress towards goal attainment. Constructive feedback is given so the student can continue to improve. This is a S/U experience.

Post-Simulation Feedback: The reflection of the simulated clinical experience journal entry criteria is located in the AMH Instructions. If you consented for participation in simulation research, please remember your self-assigned code. If you did not consent earlier and want to consent now, Dr. Sanderson has the consent forms. The form will be the CLECS comparing simulation and leadership clinical. This is important information and AMH has been revised based on this feedback.

Professional Integrity and Confidentiality

You did sign a Professional Integrity and Confidentiality Agreement during your first semester and it is applicable to AMH.

APPENDIX G

Template for Fifth Semester Simulation for Leadership

Objectives:

1. Communicate with team members, and facilitators including SBAR, therapeutic, and closed loop communication
2. Provide safe quality care to a team of patients
3. Implement prioritization and delegation skills
4. Use and improve critical thinking skills
5. Develop leadership skills

Pre-Simulation Exercises: ***Fundamental Simulation Learning System (SLS) Scenario 5, 7, 8, & 10***

1. Complete and print off Pre-Simulation Exercises for Scenarios 5,7, 8, & 10 of Fundamental Simulation Learning System
2. Turn in the Pre-Simulation Exercises at Advanced Mock Hospital
3. Complete the reading assignment in the instructions for Advanced Mock Hospital

Post-Simulation Exercises:

Submit a Reflective Journal to include:

- What you learned
- How this experience made you feel
- How do you think this experience will influence your nursing care in the future
- List at least one positive intervention or interaction you did during the simulation
- Is there anything you would like to have changed or performed differently in the simulation

Evaluation of Learner: Clinical Learning Environments Comparison Survey (CLECS)
Evaluation Tool of Simulation: METI SET Tool
Facilitation: Student Driven with multiple facilitators (course leader, clinical associate, course faculty involved in the scenario. Debriefing to occur in Nursing Resource Lab **Level of Student:** Senior Level prior to Precepting (NURS 4911)
Minimal Number of Participants: 1 **Maximum Number of Participants:** 5
Scenario Time: Prebrief 10 min Simulation 40 min
Debriefing Time: 30 min **Video Recording:** Depends on Research
Will recording be retained: No
Designers: Evolve SLS Fundamentals with Modifications by researcher and lab coordinator for use in NURS 4911
Validation and Peer Review: Peer reviewed with Leadership Faculty and member of hospital Staff Development

Carl Rogers	**Lisa Rae**	**Maurice Arviso**	**Boyd Dubois**
Props	**Props**	**Props**	**Props**
Male manikin with graying hair wig	Female manikin with graying hair	Male manikin with graying hair wig	Male manikin with graying hair wig

IV 20 gauge: SL (Rt forearm) HOB elevated 45 degrees Elevate rt foot off bed Moulage- Drsg to rt heel. Kerlix Call light **Medications:** Insulin NPH Regular Ins.-Lispro Morphine 2 mg IV D50 Glucagon Insulin syringes Injection Pad Alcohol pads ID band Printed SBAR, MAR, Blood Sugar Orders Pt Name Sheet and Flip Information Cards	wig IV 18 gauge: NS at 75 cc/hr (Rt AC) Urinary incontinence pad-soiled with urine Hygiene and linen supplies Moulage-redness over sacral area and hematoma on rt hip-warm Non-skid socks Call light ID band Printed SBAR, MAR, MD orders Medications: Hydromorphone 1 mg/ml Acetaminophen 500 mg tablets Pt Name Sheet and Flip Information Cards	IV 22 gauge: D5LR (Rt hand) @75 cc/hr HOB elevated 45 degrees NC at 2L/min Call light ID band Printed SBAR, MAR, MD orders **Medications:** Acetaminophen	IV 18 gauge: LR at 120 cc/hr (Rt forearm) Rt hip incision with staples and drsg. Wound supplies: Gauze & Tape Jackson-Pratt drain with simulated serosanguineous drainage IV medication syringes, Abductor pillow Sequential compression device boots and pump Call light Incentive spirometer Alcohol pads ID band Printed SBAR, MAR, Orders **Medications:** Morphine for injection 2 mg/1 mL concentration in 1 mL vial Hydrocodone 5 mg/acetaminophen 500 mg tablets-**Must decide right medication depending on orders and patient condition** Pt Name Sheet and Flip Information Cards

Debriefing*: (Ask at least one from each section)* **First take a deep breath and off the top of your head how do you feel?**

Aesthetic Questions:

"I would like each of you to talk to me about the problem(s) your patients experiencing today and why."

"What was your main objective during this simulation?"

"What order did you see the patients and why?"

Personal Questions:

"How did this scenario make you feel?"

"What made you chose the actions/interventions/focus you performed?"

Empirical Questions:

"I would like for each of you to talk with me about the knowledge, skills, attitudes (KSA) and previous experiences that provided you the ability to provide evidence-based care to this team of patients."

Ask about these specifically: 5 rights of delegation, prioritization, time management, SBAR, therapeutic communication, closed loop communication, 8 rights of medication administration, safety concerns.

Ethical Question:

"Talk to me about how your personal beliefs and values influenced the care provided to this team."

Reflection:

"Will each of you tell me how you knew what to do this team of patients and why?
"Which patient should have been seen first and why? Which tasks could you delegate and to who? Did you know how to use conflict resolution or negotiate with team members to take care of the patients?"
"If we could re-do this scenario now, what would you change and why?"
"How will you use this in your professional practice?"

How can we make this simulation experience better?
Now that we have discussed and reflected on this experience, give me one word that describes how you feel.
Remember to complete your post simulation reflective journal and email to Dr. _____ by _____.
What is your leadership style? What leadership style did you use today?

APPENDIX H

Permission to Use CLECS

August 11, 2014

Dear Teresa,
It is with great pleasure that I give you permission to use the Clinical Learning Environment Comparison Survey (CLECS) for your work that began in 2011 and is ongoing. I'm excited that you are using it and look forward to learning about your outcomes. Please feel free to contact me with any questions during your study.

Best Regards,
Kim

Kim Leighton, PhD, RN, ANEF
Asst Dean of Research & Simulation Faculty Development
Institute of Research and Clinical Strategy
DeVry Education Group
Downers Grove, IL 60515

APPENDIX I

CLECS Survey

CLINICAL LEARNING ENVIRONMENT COMPARISON SURVEY

Thank you for agreeing to complete this survey. This study will investigate how well your learning needs are met in the traditional clinical environment and in the simulated clinical environment. The traditional clinical environment might include the hospital, outpatient clinic, community organization, or patient home. The simulated clinical environment typically takes place in a simulation lab or designated area of the skills lab, utilizing a human patient simulator.

You have been chosen to complete this survey because you have had at least one opportunity to care for a human patient in the traditional clinical environment and at least one opportunity to care for a simulated patient using a human patient simulator. You are in a unique position to help nursing faculty learn more about what is important when learning in the traditional and simulated clinical environments.

The survey will take approximately 10 minutes to complete. Please take the time to fully complete the survey, using either pencil or ink to mark your responses in each of the three sections.

The table on the following page contains a list of learning needs and two rating sections. In Section I, please circle the number corresponding to how well each learning need is met in the traditional clinical environment. In Section II, circle the number corresponding to how well each learning need is met in the simulated clinical environment. The choices are from Well Met [4] to Not Met [1]. If the statement does not apply to any of your personal experiences, circle NA [Not Applicable].

PLEASE TURN THE PAGE TO BEGIN

LEARNING NEED	SECTION I: TRADITIONAL CLINICAL ENVIRONMENT					SECTION II: SIMULATED CLINICAL ENVIRONMENT				
	Well Met	Met	Partially Met	Not Met	Not Applicable	Well Met	Met	Partially Met	Not Met	Not Applicable
1. Preparing to care for patient	4	3	2	1	NA	4	3	2	1	NA
2. Communicating with interdisciplinary team	4	3	2	1	NA	4	3	2	1	NA
3. Interacting with patient	4	3	2	1	NA	4	3	2	1	NA
4. Providing information and support to patient's family	4	3	2	1	NA	4	3	2	1	NA
5. Understanding rationale for patient's treatment plan	4	3	2	1	NA	4	3	2	1	NA
6. Understanding patient's pathophysiology	4	3	2	1	NA	4	3	2	1	NA
7. Identifying patient's problems	4	3	2	1	NA	4	3	2	1	NA
8. Implementing care plan	4	3	2	1	NA	4	3	2	1	NA
9. Prioritizing care	4	3	2	1	NA	4	3	2	1	NA
10. Performing appropriate assessment	4	3	2	1	NA	4	3	2	1	NA
11. Evaluating the effects of medications administered	4	3	2	1	NA	4	3	2	1	NA
12. Assessing outcomes of the care provided	4	3	2	1	NA	4	3	2	1	NA
13. Identifying short- and long-term nursing goals	4	3	2	1	NA	4	3	2	1	NA
14. Discussing patient's psychosocial needs	4	3	2	1	NA	4	3	2	1	NA
15. Discussing patient's developmental needs	4	3	2	1	NA	4	3	2	1	NA
16. Discussing patient's spiritual needs	4	3	2	1	NA	4	3	2	1	NA
17. Discussing patient's cultural needs	4	3	2	1	NA	4	3	2	1	NA
18. Anticipating and recognizing changes in patient's condition	4	3	2	1	NA	4	3	2	1	NA
19. Taking appropriate action when patient's condition changes	4	3	2	1	NA	4	3	2	1	NA
20. Thoroughly documenting patient care	4	3	2	1	NA	4	3	2	1	NA
21. Reacting calmly to changes in my patient's condition	4	3	2	1	NA	4	3	2	1	NA
22. Knowing what to do if I make an error in my care	4	3	2	1	NA	4	3	2	1	NA
23. Being confident in my decisions	4	3	2	1	NA	4	3	2	1	NA
24. Having instructor available to me	4	3	2	1	NA	4	3	2	1	NA
25. Feeling challenged and stimulated	4	3	2	1	NA	4	3	2	1	NA
26. Receiving immediate feedback on performance	4	3	2	1	NA	4	3	2	1	NA

27. Feeling confident in abilities	4	3	2	1	NA	4	3	2	1	NA
28. Feeling supported by instructor and peers when making care related decisions	4	3	2	1	NA	4	3	2	1	NA
29. Improving my critical thinking skills with experience	4	3	2	1	NA	4	3	2	1	NA

IDENTIFIER # _____

CONTINUED ON PAGE 3

SECTION IV: DEMOGRAPHIC INFORMATION

Please answer the following questions by placing a checkmark (√) in the space corresponding to your answer. If the question asks for a specific number, write it in the space provided.

30. What is your age range? 19-25_____ 26-35_____ 36-50_____ 51 & >_____

31. How many years of prior healthcare experience have you had (i.e. certified nursing assistant, LPN, respiratory therapist, emergency medical technician, etc.)? ___ <1 ___ 1-2 ___ 3-4 ___ >5

For the following questions, please consider all nursing course(s) you have taken throughout your current program that have/had both a clinical experience and a simulation experience.

32. On average, how many hours did you spend preparing to provide care to one human patient? _____

33. On average, how many hours did you spend preparing to provide care for one simulated patient? _____

34. On average, what length of time was spent in the simulation lab with each visit, including debriefing?
___<1 hour ___1-1.5 hours ___2 or more hours