8-2016

What They Say: Student Voices in Nursing Simulation

Andrea McMahan Damewood
University of Tennessee - Knoxville, andi@utk.edu

To the Graduate Council:

I am submitting herewith a dissertation written by Andrea McMahan Damewood entitled "What They Say: Student Voices in Nursing Simulation." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Educational Psychology.

Mary F. Ziegler, Major Professor

We have read this dissertation and recommend its acceptance:

Ralph G. Brockett, John M. Peters, Margaret M. Casado

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

What They Say: Student Voices in Nursing Simulation

A Dissertation Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Andrea McMahan Damewood
August 2016

Acknowledgements

I would like to express my sincere thanks to my doctoral committee: Dr. Mary Ziegler, for her insight and guidance through the proposal and dissertation process; Dr. John Peters, who was with me from the start and reminds me to slow down and think; Dr. Ralph Brockett, who is unfailingly kind and supportive as a professor and committee member; and Margaret Casado, for her good cheer and for agreeing to serve and working so well with us all.

Special thanks are in order for the love, support, and assistance I was given throughout the seven years of my doctoral program from my family. To my husband, Jef Damewood, the smartest person I have ever met, who is my own real world PhD; he never doubted I could do this and tolerated the hell out of me the entire journey. To my parents, Denny and Brenda McMahan, who always pushed their daughters to excel and never let us quit. To my sisters, Angie Mitlehner, Amy Jenes, and Anna McMahan who led by example and motivated me with their accomplishments and encouragement. And to Maptain, who provided furry company through this process and showed me what motivation and determination can achieve.

Additional thanks go to those who helped me in special ways during the solo part of the doctoral journey: Dr. Becky Smeltzer and Dr. Emily Gray for sharing the experience with me; Dr. Vickie Niederhauser for supporting my research; Dr. Tami Wyatt for being my nursing mentor and sounding board; Evan Campbell for holding down the fort in my absences; Susan Fancher for her enthusiasm for simulation; Dr. Kathleen Thompson for her constant encouragement; and all of the faculty at the College of Nursing who have inquired about my progress, encouraged me, told me of their own experiences, pointed me in the direction of excellent resources, and celebrated with me.

Lastly, thank you to my study participants – you truly inspired me.

Abstract

Simulation, the use of artificial systems to represent real systems, is a growing practice in the education and training of adults. In the health care field, simulation environments allow for mistakes and provide an environment where medical professionals can practice skills and procedures without harm to actual patients. In recent years, nursing schools around the world have created simulation environments and built simulation events into their curricula. As the use of simulation has increased, the research on simulation effectiveness, best practices and outcomes has grown.

The problem this study addresses is the lack of research describing the safety of the learning environment in clinical simulation from the point of view of undergraduate nursing students. Although safety for the student in the simulation environment is desired, very little research defines what that means to the students themselves. The purpose of this study was to better understand, from a student's perspective, how undergraduate nursing students describe a safe learning environment in clinical simulations from their experiences in these events. From analysis of participant interview transcripts, the over-arching theme of *ok to make mistakes* was developed. This main theme encompassed several sub-themes including: *nerve-wracking and blindsided*, *instructor intervention/instructor discord*, *being watched/comfortable with each other*, *do no harm* and *it got better*. These findings give voice to the students in simulation and is intended to inform the fields of adult learning and nursing education.

Table of Contents

Chapter 1

Introduction

In general, simulation is “something that is made to look, feel, or behave like something else especially so that it can be studied or used to train people” ("Simulation," 2015). Simulation experiences are often substituted for real life experiences in order to decrease risks and costs or when acquiring skills in a real world environment is not practical. Simulation activities are employed in many high-risk fields such as the military, aviation, and nuclear engineering, where the opportunity to experience real life situations is lacking, or the risk of life and equipment is too great to be allowed (Issenberg, McGaghie, Petrusa, Gordon, & Scalese, 2005). In medical fields, simulation is used to practice skills and remove risk to patients during medical training. In nursing literature, simulation is more narrowly defined as “activities that mimic the reality of a clinical environment and are designed to demonstrate procedures, decision-making, and critical thinking through techniques such as role playing and the use of devices such as interactive videos or mannequins” (Jeffries, 2005, p. 97). Simulation is prevalent in many fields and in the year 2016 includes such activities as immersive virtual reality computer gaming and full scale medical scenarios with simulated human beings. This study will focus on undergraduate nursing students’ perceptions of safety in the simulation learning environment.

Simulation in Nursing Education

Simulation-based medical education (SBME), has existed since the 17th century when obstetric manikins were devised and used for birthing simulations (McGaghie, Issenberg,

Petrusa, & Scalese, 2010). In nursing education, simulation is employed to teach and perfect clinical nursing skills, previously the realm of clinical teaching sites—hospitals and clinics. The rise in simulation in nursing education is due to several factors including shortages of clinical sites for increasing numbers of nursing students and the restrictions many clinical sites put on tasks students can perform. Additionally, technological advancements in simulation equipment such as manikins and task trainers continue to make clinical simulation a practical alternative (Berragan, 2011). These factors are present nation-wide and even world-wide and the former are problems nursing schools are being forced to address. Clinical simulation in lieu of or in conjunction with real life clinical experiences, is one solution developed and employed by many schools and colleges.

Clinical simulation is an accepted and growing trend in nursing education curricula (Durham, Cato, & Lasater, 2014; Harder, 2010; Hope, Garside, & Prescott, 2011; Sullivan-Mann, Perron, & Fellner, 2009). The United States is facing a shortage of nurses in healthcare settings and universities, technical schools and other educational institutions are attempting to fill the gap and graduate greater numbers of job-ready nurses (Rosseter, 2014). Research indicates employers expect new nurses to be ready to perform their jobs immediately (Jeffries, 2005). At the same time, clinical sites, where students normally practice the skills they learn in school, are becoming harder to find and more restrictive in what tasks they allow students to perform. To cope with greater numbers of students and reduced opportunities for clinical practice, many institutions introduced clinical simulation into their curriculum (Governors, 2015). Clinical simulation in nursing varies

in technology and delivery systems including: high-fidelity manikins in highly realistic clinical settings, task trainers, standardized patients, and human actors in scripted role-playing scenarios.

Clinical simulation in nursing education attempts to mimic the tasks, skills, and settings nursing students would normally find in clinics and hospitals. High-fidelity manikins (also manequinns) are human analog devices which look like adult, adolescent, and baby humans. These devices, which may be male or female are immediately recognizable as human analogs and have the ability to be programmed to breathe, bleed, moan, blink, convulse, give birth, and perform many other physical activities. Their purpose is to add realism to medical simulation and react as actual humans would to medical interventions. Fidelity within simulation is defined as the degree to which the simulation mimics real life (Bland, Topping, & Wood, 2011) and high-fidelity manikins represent the best realism in human analog technology currently available.

Not all simulation requires this level of fidelity or the use of human analogs. Task trainers are simulated body parts such as an arm used for needle insertion or a portion of skin used for suture practice. Task trainers "allow the learner to focus on the isolated task" (Bradley, 2006) and are more cost-effective for repeated use by large numbers of learners than high-fidelity manikins. Task trainers often make up the bulk of the simulation technology in a nursing laboratory. In addition, real humans may be used in simulation events. Examples of this include mental health professionals role-playing a mental health patient in an interprofessional healthcare interview simulation, or

standardized patient actors playing the role of a patient with specific symptoms to test clinical diagnostic skills.

In the last three decades, as clinical simulation became more accepted and wide-spread in nursing education, nursing educators saw a need for information dissemmination and standards of best practices within the field. To that end, they created governing and accrediting bodies for nursing simulation. Those organizations include the International Nursing Association for Clinical Simulation (INACSL) and the Society for Simulation in Healthcare (SSH). The members of these groups create and adhere to standards of best practice as well as encourage research on evidence-based practice in healthcare.

Why Simulation is Important

Clinical simulation allows nursing schools more flexibility in scheduling and determining what skills are taught and emphasized in their curriculum. It also gives nursing faculty and students a safe environment to manipulate and learn. Simulation is active learning; the students interact with the environment and the patient (human or simulated). Nurses "need to be actively involved with the content to help make sense of it, to internalize the knowledge, and to apply that knowledge to practice" (Rowbotham, 2010). It is also a controlled environment, where skills can be practiced and mistakes do not cost life a human life or well-being (Bearnson & Wiker, 2005).

Most recently published research on simulation in nursing education addresses several main themes. These include: simulation as a means of skills acquisition and perfection (Harder, 2010), simulation to promote critical thinking (Sullivan-Mann et al.,

2009), and simulation as a safe environment (Ganley & Linnard-Palmer, 2012). Much of this research on simulation in clinical nursing education centers on the learning outcomes and skills proficiency of the students (Bowling, 2015; Hope et al., 2011; O'Donnell, Decker, Howard, Levett-Jones, & Miller, 2014). Additionally, this research addresses best practices and the design of the simulation experience by educators and simulation experts (Jeffries, 2005). Most, if not all of recent peer-reviewed research I reviewed is written for educators from an educator's point of view. While peer to peer information is valuable, it may be ignoring other points of view and factors that influence simulation experiences.

Simulation for Clinical Skills

Recent research shows that clinical simulation is an effective way to train today's nurses and prepare them for their career. A large study published in 2012 by the National Council of State Boards of Nursing (NCSBN) investigated the effectiveness of simulation education compared to clinical education in nursing programs. Study participants were undergraduate nursing students in ten nursing programs nationwide who were followed throughout their programs of study. The students were randomly assigned to one of three groups, Control (no more than 10% of clinical hours from simulation), 25% Group (25% of clinical hours from simulation) and a 50% Group (50% of clinical hours from simulation) through the completion of their programs. This comprehensive study found no significant difference in the clinical skills acquisition of those students who experienced up to 50% of their clinical education in simulation compared to those in traditional clinical settings (Hayden, Jeffries, & Kardong-Edgren, 2012). The study

results confirmed what many educators already suspected, that clinical simulation, when carefully planned, executed and evaluated, is an effective way of delivering nursing education. With current trends and this study's results indicating the effectiveness of replacing clinical hours with simulation hours, simulation in nursing education will only continue to grow. As the demand for high quality nursing simulation technology increases, the technology available will evolve and advance in complexity and functionality.

Simulation for Critical Thinking Skills

Since the learning environment is controlled by the educator in simulation, skills such as critical thinking can be emphasized. Nursing educators are studying whether students can gain critical thinking skills effectively through simulation events, although the effectiveness has not yet been fully determined (O'Donnell et al., 2014). The controlled environment also enables nurse educators to teach students how to be a nurse by allowing for time before and after the experience to talk to the students about what to expect and to examine their performance post-simulation (Rudolph, Raemer, & Simon, 2014; Shinnick & Woo, 2013). These times are referred to as the briefing and debriefing, borrowing from military terminology. Students are also exposed to a wider range of experiences through simulation than they would encounter in a traditional clinical setting, such as charting in electronic health record software, and calculating and administering medication, which may not be allowed by clinics and hospitals (Bowling, 2015). This simulation experience contributes to the goal of graduates who need less on-the-job training once employed.

Critical thinking skills are also known as clinical judgement skills in the nursing literature (O'Donnell et al., 2014, p. 377), which simulation attempts to encourage. These skills are often difficult to teach, and are gained through experience rather than didactic learning, which makes these skills seem well-suited to a simulation environment. The learning environment available in simulation – active and responsive, yet forgiving – allows for clinical judgement successes as well as mistakes, which could not be allowed in a real clinical setting affecting actual patients.

Safe Learning Environment and Simulation

In the fields of psychology and motivation, Maslow's Hierarchy of Needs, a listing and ranking of human needs, is often depicted as a layered triangle.

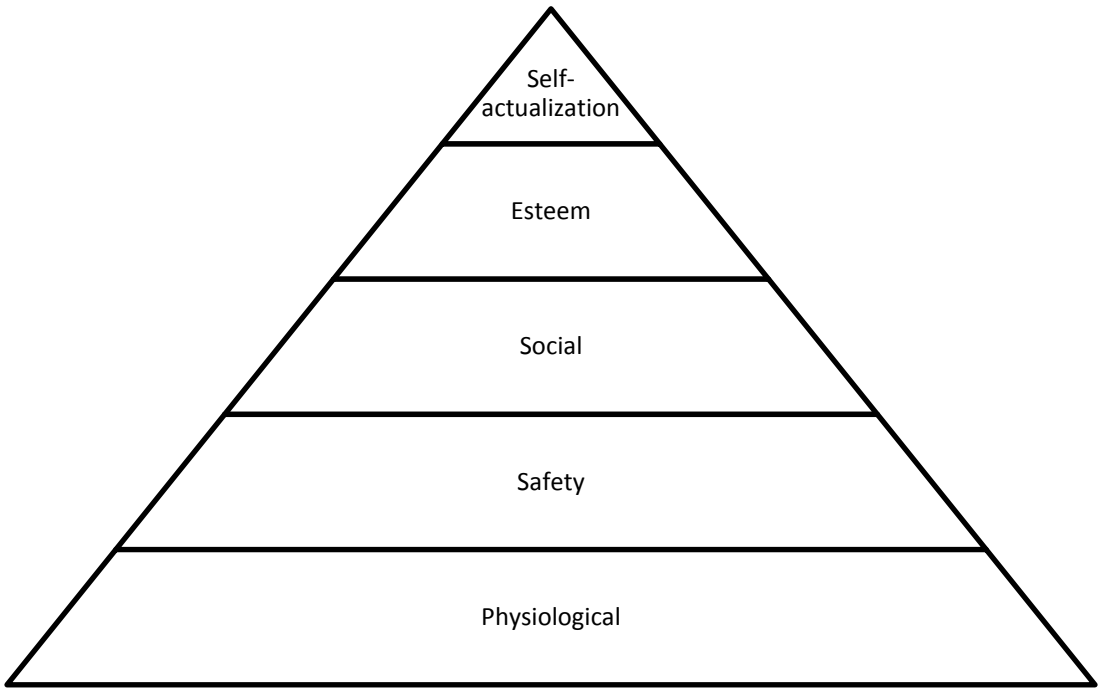

Figure 1. Maslow's Hierarchy of Needs

The base of the triangle contains the most basic human need, as determined by Maslow, and each layer builds upon the layer below to end in the pinnacle layer – the complete or self-actualized person. Safety is considered a basic human need and appears as the second layer, above only physiological well-being in Maslow's Hierarchy of Needs (Maslow, Frager, Fadiman, McReynolds, & Cox, 1970). Safety is defined as security, protection, freedom from fear and anxiety, and having order and structure (p. 39). Just above safety in this hierarchy, is the need for belongingness and love (p. 43). All three of these basic human needs – physical well-being, safety, and belongingness - can be applied to the learning environment as well. Safety in learning environments is a topic that has been researched in secondary and adult learning literature for over fifty years (Rowbotham, 2010). Initially, safety referred to the physical safety of children in their schools and classrooms, but more recently emotional safety has been recognized as a component of a safe learning environment (Turner & Braine, 2015). Two researchers in the field of social work, Holley and Steiner (2005), describe "a classroom environment that allows students to feel secure enough to take risks … explore their knowledge … safety in this sense refers to protection from psychological or emotional harm" (p. 50).

A safe environment within simulation can mean a variety of things. Since the simulated people, equipment and environments are not real, there is safety knowing that no patients will be physically harmed or disadvantaged (Keskitalo, 2012). However the safe environment should also extend to the learners. Students must "feel safe to interact, experiment and explore new topics and constructs" in simulation events (Hope et al., 2011, p. 714). This is accomplished by introducing the learners to the new environment,

going over the objectives of the upcoming scenario(s), and allowing them to succeed or make mistakes on their own (Rudolph et al., 2014). The safe environment must extend to the post-simulation debrief process as well to allow for "an environment of trust" (Fanning & Gaba, 2007, p. 116). Mistakes should be and are addressed, but as learning opportunities rather than harsh criticisms. This is one way in which a simulation may differ from a real life situation: within the safety of a simulated environment, the learner is allowed to make mistakes (Heimlich, 1996). In a real life situation a critical mistake would not be allowed or would be harshly and immediately criticized.

Although the role of the student or participant in simulation events is acknowledged within the early best practices framework created by Jeffries in 2005 and later re-examined by the State of the Science project committees in 2014, no mention is made of the students' perspective of the learning environment within simulation. Few studies examine the academic or psychological safety of students within these situations, and those which do comment on the need for more research in this area (Ganley & Linnard-Palmer, 2012).

Statement of the Problem

Much of the research on simulation in clinical nursing education centers on the learning outcomes and skills proficiency of the students as stated above. Additionally, professional nursing simulation organizations and nursing educators currently conduct research on best practices in the design of the simulation experience by educators and simulation experts (Jeffries, 2005). The problem this study will address is the lack of research describing the safety of the learning experience in clinical simulation from the

point of view of the participants: undergraduate nursing students. Although safety for the student in the simulation environment is desired, very little information exists defining what that means to the students themselves.

Purpose of the Study

The purpose of this study was to better understand, from a student's perspective, how undergraduate nursing students describe a safe learning environment in clinical simulations from their experiences in these events. In this study safety in simulation refers not only to the fact no human patient is harmed but also to the risks students may face in simulation such as "…academic failure, negative judgment by their faculty and peers, loss of integrity, [and] embarrassment…" (Ganley & Linnard-Palmer, 2012) Since little information from the student perspective exists, this study will give voice to the students in simulation and help inform nursing educators in simulation design concerning safe learning environments.

Research Question

This study addresses the following research question: How do undergraduate nursing students describe their experiences of safety during clinical nursing simulations?

Theoretical Framework

The theoretical framework for this study is built on constructivist learning theory. Constructivist learning theory is a broad idea within both child and adult learning that posits that learners construct knowledge through experience. Merriam and Bierema (2014) note, "constructivism is less a single theory of learning than a collection of perspectives all of which share the common assumption that learning is how people make

sense of their experiences—learning is the construction of meaning from experiences" (p. 36). Constructivism came about as a reaction to behaviorism and traditional theories which assumed the learner an "empty vessel" which must be filled with knowledge from an expert (Jonassen, 1999). Constructivism gave rise to activity theory, a theory proposed and studied by Russian scholars Alexei Leont'ev and Lev Vygotsky in the early 20th century. Activity theory's focus is the "interaction of human activity and consciousness (the human mind as whole) within its relevant environmental context" (Jonassen & Rohrer-Murphy, 1999, p. 62). Activity theory reflects Vygotsky's focus on the "sociocultural context in how people construct meaning from experience" (Merriam & Bierema, 2014). Vygotsky's social constructivism, along with other forms of constructivism, appears regularly in adult learning literature and influence "self-directed learning, transformational learning, experiential learning, reflective practice, situated cognition, and communities of practice" (p. 37).

Jonassen (1999) took the ideas of activity theory and the Russian school of cognitive development and applied them to the design of computer-based learning environments. He called this model of instructional design Constructivist Learning Environments (CLEs). Jonassen believed that CLEs were an essential component to the effective teaching of adults. His focus was online learning (also called computer-based learning) environments and how to make them active and experiential for students. CLEs, Jonassen (1999) argued, should be active, problem-based, ill-defined, and student-centered. Although CLEs can be seen as in opposition to traditional lecture-based

teaching, Jonnasen suggested the two methods are two sides of the same coin – necessary and complementary (Jonassen & Rohrer-Murphy, 1999).

Jonassen's CLEs include: "a problem-project space, related cases, information resources, cognitive tools, and conversation and collaboration tools" (Jonassen & Rohrer-Murphy, 1999, p. 69) for student-centered learning. These environments also include modeling, coaching, and scaffolding by instructors or facilitators in support of learning (Jonassen, 1999). Clinical nursing simulation events are CLEs for the following reasons: the events are active, problem-based and student-centered requiring action and critical thinking by the students involved and the events are designed to re-inforce or expand upon skills and information delivered in lecture settings. Additionally, the events are preceded and followed by "scaffolding" by the instructor or facilitator which supports the students' learning. In addition, CLEs as a theoretical framework for this study has the benefit of including technology as a central tool in the learning environment, which students manipulate in the process of knowledge construction. Simulation also includes technology and technology manipulation as part of the active learning environment.

The determination to approach this study from a constructivist point of view was made first unconsciously and then with deliberation. This style of learning is congruent with my personal learning style and beliefs. However, as I researched simulation events, learning environments and the design of those environments, I noticed how neatly Jonassen's CLEs align with nursing education simulation environments. Although his focus is on computer-based learning and online learning, his ideas translate easily into the world of nursing simulation. I was unable to find him referenced in the nursing education

literature, but I was intrigued by how well his model fit both the structure and the desired outcomes of nursing simulation. CLE designs are based on active, experiential learning which is constructed by the learner both at the time of action and afterward via reflection. In simulation, as in Jonassen's CLEs, the learner manipulates his or her environment and observes the effects of that manipulation.

Significance of the Study

This study is significant for several reasons. There are recent and ongoing efforts in nursing to create more effective simulation environments for students as evidenced by the recent explosion of research, literature and professional organizations devoted to best practices. The opportunity to ask the students what they experience and have them describe a safe learning environment will lead to more informed decisions in simulation design. Also, the information gleaned from student experiences will give a voice to those most affected by simulation and bring those previously overlooked perspectives into the nursing education literature.

Currently, references to CLEs are not found in the nursing literature. This study will link CLEs to nursing simulation environments and lead to adult learning literature better informing simulation education in nursing. Including adult learning literature in research for nursing education can strengthen the adult learning theory used to design and implement nursing programs for adult learners.

Assumptions

Several assumptions influenced the design of this study. Some assumptions address clinical simulations as learning environments. Recent and current literature in

nursing education supports the potential growth and importance of simulation in nursing programs. This is due to the issues facing nursing schools stated previously: lack of clinical space, liability issues, and increased student enrollment which leads to pressure within nursing schools to implement simulation as a solution to these issues. A second assumption of this study is that a safe learning environment is an essential component of an effective experiential learning experience. Other assumptions relate to the participants in the study, such as: the students in this study will be able to recognize and describe a safe learning environment in simulation events. Another assumption is that the students in this study, college students studying at the senior level, meet the criteria of adult learners as a whole. This assumption is based on the fact that most of these students are independent individuals, make most of their own major decisions, and are intellectually and personally more mature than a child; financial independence of the participants is not assumed.

Delimitations

The participants in this study are senior level nursing students who have previously experienced at least one clinical simulation event. This is a convenience sample of students in a traditional undergraduate nursing program at the four year university where I work as a staff member.

Limitations

This research study includes a group of undergraduate students who have already completed at least two years of college coursework before entering a nursing-specific undergraduate program. Due to the makeup of this group, conclusions from this study

may or may not be applicable to other nursing student groups such as those in associate's degree programs, experienced nurses returning to school for additional credentials or those experiencing simulation in a setting outside of an educational institution. Although the study group is limited, my findings will inform both future research and practice, particularly for a better understanding of how students view their simulation environment.

Researcher Position Statement

My interest in simulation as a technology-enhanced learning environment for adult learners developed over the past eighteen years as a technology support professional at an institute of higher education. From my first job supporting software for synchronous online classes, to my current position as the IT Director of a college within the University, my role has been to support technology used for teaching and learning. As my roles grew and changed, I became more aware of, and interested in, instructional design and how context and environments affect learning. As a staff member of a university, my focus has always been on adult learners and my interest in that group led to my enrollment in an adult learning doctoral program. Through this program, I explored different learning theories, the history and foundations of adult education, and began my journey of scholarship within the field.

I was hired into my current role, IT Director of a university academic department, in early 2013. One of the first projects I worked on in this role was the renovation of the former student health center into a high-fidelity simulation laboratory for the college of nursing. The first week of my new job included a tour of the gutted facility and

discussions of the layout of the new rooms and technology. This is where I first discovered the amount of time, thought, and effort that goes into the planning of the learning environment in nursing simulation. Every discussion included thoughts about how the environment would appear to the students, how to make it more realistic and how to build space for both the simulations and the debriefing sessions held afterward. As I learned more on the job about the design of simulation events and spaces, I was simultaneously participating in classes in the evenings as part of my adult learning coursework and was able to apply what I was learning in class directly to what I was learning on the job. This led to my current interest in how adult students learn in a simulation environment and how the design of those environments or events may help or hinder learning.

As a staff member in the college where my study participants attend classes, the students know who I am and that my role is to support their learning, including simulation. In this way, I have a relationship with my potential study participants, although not as an educator. While my professional goal is to facilitate their learning and I am interested in them as adult learners, I maintain a distance from them and their specific academic situations in that I am not normally present in class and do not directly influence their performance or grades.

Definition of Terms

In order to clarify some of the topics within this dissertation, a list of definitions for some commonly used terms is below:

1. Activity system: system within activity theory which contains a subject, an object, tools, and actions in which the goal is to transform the object.
2. Activity theory: learning theory which posits that learning emerges from activity.
3. Apgar: a quick test performed on a newborn at one and five minutes after birth to determine how well the baby tolerated the birthing process and is how he/she is doing outside the mother's womb.
4. Brief/prebriefing: a time before the simulation scenario begins dedicated to introducing the scenario's background information, the simulation environment and the students' roles in the scenario.
5. Clinicals: part of the practical learning experience of nursing students, clinicals are activities which take place in a clinical (hospital or clinic) setting and may include some patient care.
6. Constructivist Learning Environments (CLEs): a model of instructional design in which technology manipulation can be performed freely by students leading to knowledge construction.
7. Debrief/debriefing: a time after a simulation scenario dedicated to discussion of the scenario outcome and the actions and decisions of the participants within the simulation.
8. Fidelity: the extent to which the appearance of a simulated situation or technology appears realistic; realism.

9. Learning environment: the physical space and psychological setting created by educators for student learning; examples include classrooms and laboratories.
10. Manikin/mannequin: a full body human analog device which is used as a stand-in for real patients in medical training. Manikins may be of various levels of fidelity and complexity.
11. Med-Surg: a course within many nursing programs known as Medical-Surgical which covers a variety of adult healthcare situations, considered a foundational course in nursing.
12. Mother-baby: a course within many nursing programs which covers the care of mothers and babies immediately post-partum.
13. Peds: a course within many nursing programs, shortened from Pediatrics, which covers the care of children from infancy through age eighteen.
14. Safety: comfort; lack of physical or psychological discomfort.
15. Sharps: in medical terminology, sharps are objects used in medicine which can cut or pierce skin such as needles.
16. Simulation scenario/event: a planned learning event involving a simulated setting which mimics a real-world event where students are allowed to manipulate the simulated environment.
17. Simulation/clinical simulation: a system representing another system; in nursing this mimics the reality of a clinical environment, typically with

manikin human analogs and functional or replicated clinical equipment in a hospital or clinic setting.

18. Standardized patients – actors trained in symptoms of diseases who play the role of a patient in a clinical diagnosis simulation for medical professionals; standardized patients may also encompass the group of people recruited who allow medical professionals to practice physical examinations for the purpose of skills mastery rather than diagnosis.
19. Task Trainer – a body part or analog which is used in nursing to practice specific skills; examples include synthetic skin used for suture practice, and human-like arms with internal tubing which allows for practice with injections, blood withdrawal, and setting intravenous lines.
20. Undergraduate nursing students: students with two years of general college education, who enter a baccalaureate nursing program at the junior level with the goal of graduating with a Bachelor of Science in Nursing (BSN).

Conclusion and Outline of the Study

This study's paper has the following chapter structure: Chapter one serves as an introduction to the study and to familiarize the reader with both the purpose and significance of the research. Chapter two reviews the available literature around the topic of this study. Chapter three examines the methodology used in this study and describes the data collection and analysis. Chapter four presents the findings of the data analysis. Lastly, chapter five discusses the study findings and implications of the results.

Chapter 2

Literature Review

Introduction

In this literature review I will introduce the concept of simulation and briefly describe it through the literature from multiple fields such as aviation and the military. My focus will be on examining research on simulation in the field of nursing, its history and its effectiveness as an educational tool. Next, I will explore claims that simulation in nursing education is a valuable tool for producing outcomes such as clinical skills acquisition and critical thinking skills. After setting this background, I will show the importance of a safe learning environment in simulations events, document the lack of research with student perspectives, and argue why that is important. Finally, I will explore adult learning theories as a foundation for simulated learning environments by positioning simulations as Constructivist Learning Environments (CLEs).

Research on Simulation

Simulation is used within different professions and fields for training, for learning, and for modeling systems or processes. As Damewood (2016) notes:

> We simulate to learn what we do not already know; to see situations from new angles; to learn from both our successes and our mistakes; and to experiment without risk to real people, environments, or property (p. 269).

Simulation can include everything from mock trials in law schools to aviation simulators in the military or flight schools. Simulations can be extremely high tech, involving numerous computers and electronic systems or equipment, but they can also be extremely

low tech, requiring only human actors and a proper simulated environment. “Simulation-based training involves immersion of a trainee in a realistic situation (scenario) created within a physical space (simulator) that replicates the real environment with fidelity sufficient to achieve suspension of disbelief on the part of the trainee” (Sahu & Lata, 2010, p. 379). Other authors discuss the long history of simulation in the fields of military and aviation (Rutherford-Hemming, 2012) even noting that the game of chess was used as a war game simulation (Bland et al., 2011, p. 665). Whatever the field or specific definition, simulation can generally be thought of a system representing another system.

The simulated system can take different forms depending on the field and the situation or skill being simulated. In nursing and other medical fields, simulation is often a complex combination of simulated human analogs (manikins), actors, students or trainees, real and simulated medical equipment, and persons behind the scenes making the action within the simulation appear as real as possible. Set up can be extensive with rooms, buildings or other spaces mocked up to appear as functional hospitals or clinics. In fields other than nursing or medicine, simulation may be accomplished in near perfect replica of the target environment (flight simulators) (Salas, Bowers, & Rhodenizer, 1998) or be as simple as actors role-playing for a student or trainee immersed in the scenario (Roman, 2014).

Research on Nursing Simulation

Peer-reviewed literature on the use of simulation in health care education, including the field of nursing, spans over six decades (Issenberg et al., 2005). Over the course of those decades, a progression in research on simulation as an education tool is

evident. Beginning in the late 1990s, simulation literature became more prevalent in journals, as health care professional started sharing what they were doing in their own practices through descriptive articles. As simulation equipment became more technologically advanced and clinical opportunities scarcer (Hope et al., 2011, p. 712), use of simulation in medical education increased, resulting in a surge of publications on simulation use in the early- to mid- 2000s. Practically every published article on simulation I reviewed mentions the growth of literature or research on simulation in health care (Harder, 2010) (Sullivan-Mann et al., 2009) (Durham et al., 2014) (Hope et al., 2011). The growth and development of simulation use in medical and nursing education led the community of simulation educators to start a dialogue surrounding the formation of groups within their fields specific to simulation (INACSL, 2015). Around this time, organizations specific to simulation in health care and nursing formed and founded journals dedicated to topics surrounding simulation use in their fields. In 2003, the International Nursing Association for Clinical Simulation and Learning (INACSL) was formed by a group of nurses after several years of discussion and development as part of the National Conference on Nursing Skills Laboratories conferences (INACSL, 2015). INACSL (pronounced "in-AXE-el") sets and promotes standards for simulation in nursing education. In 2006, INACSL created a journal called *Clinical Simulation in Nursing*, which began publishing articles specific to the use of simulation in nursing education. An organization with a broader member base was established in 2004 called the Society for Simulation in Healthcare (SSH) (SSH, 2015). SSH membership includes: "physicians, nurses, allied health and paramedical personnel, researchers, educators and

developers from around the globe" and publishes a journal called *Simulation in Healthcare*, established in 2006. With the advent of professional organizations and journals specific to simulation in health care, publications of articles on topics related to simulation increased dramatically in the mid- and late- 2000s.

At first, much of the focus in the literature was on describing existing simulation practice in health care education. However, there was little established information on what should be done, how much or often, and for what purposes. Into this void in the nursing literature came the *NLN/Jeffries Simulation Framework*. This paper was the result of a large, multisite study of the current simulation-based education in nursing. The study was supported by the National League for Nursing (NLN) and Laerdal Medical, a maker of medical simulation technology (O'Donnell et al., 2014). Laerdal provided financial support in the form of manikins (SimMan®) to the study sites, however the study design and the scenarios tested were developed by the NLN and the site coordinators. This quantitative study was multi-phasic and took place over a three year timespan. Eight study sites were recruited and over nine hundred baccalaureate and associates level nursing students participated. Comparisons were made between three student groups using paper and pen simulation (case study), static manikins, and high-fidelity manikins in simulations. In a later phase, two groups using paper and pen and high-fidelity manikins (in different orders) were compared. Analysis of the data collected contributed to the simulation design report, later known as the *NLN/Jeffries Simulation Framework* (Jeffries & Rogers, 2007). The resulting framework defines five constructs within simulation design: student, teacher, educational practices, simulation design

characteristics, and outcomes (Durham et al., 2014). This framework model is an example of the scholarly growth of simulation education literature and the desire of educational professionals conducting simulation to create and follow sound educational practices. However, the framework was not set in place and assumed finished; the emerging experts in simulation continued to develop and refine it.

In 2011, INACSL assembled a panel of experts to review each of the five constructs of the *NLN/Jeffries Simulation Framework* which resulted in a series of articles titled "NLN/Jeffries Simulation Framework State of the Science Project." Each review panel looked at the published literature pertaining to each construct in the years since the original framework's publication. They described and summarized the literature, made recommendations for changes to the particular construct they studied, and noted gaps in research. One example of a change resulting from these reviews is that the construct "student" was changed to "participant" (Durham et al., 2014). The authors observed:

> It was notable that the participants in simulation were seldom the focus of the literature. Early on, it became evident that there was no consistency about what the participants in the simulation were called or what their roles were. The broadening of the term from student to participant allowed for the inclusion of the range of individuals involved in simulation. Standardization of terminology will provide more consistency, improving descriptions, and reporting of simulation activities in the literature. (p. 363)

In addition, as societies, conferences and peer-reviewed journals expanded, members of these professional organizations began to take a critical look at the practice of simulation as an educational tool by reviewing the previously published literature. These reviews, published as peer-reviewed articles in medical and nursing education journals, described and analyzed the published research on simulation in health care education by reviewing materials from 1969-2003 (Issenberg et al., 2005) and 2003-2007 (Harder, 2010). Issenberg, et al (2005) emphasized the need for Best Evidence Medical Education (BEME) which should move the "medical profession from opinion-based education to evidence-based education. The goal is to provide medical teachers and administrators with the latest findings from scientifically grounded educational research" (p. 14). The authors argued against the "medical education legacy that has relied little on evidence in its decision-making, relying instead on pseudoscience, anecdotes and flawed comparison groups" (p.14). A systematic literature review by Harder (2010) five years later noted a "significant" increase in simulation use in medical education since the Issenberg review (p. 26). Harder evaluated studies that used quantitative or mixed methods and which reported outcomes of simulation education intervention. The study's conclusions echoed others in the field that have found that simulation increases assessment and clinical skills performance. However, solid, consistent evidence for other outcomes, including critical thinking skills, is contradictory or lacking. The author's conclusions called for the development of evaluation tools specific to simulation (Harder, 2010).

The timeline of published literature around the topic of simulation in health care has shown an increase in volume and sophistication over the past three decades. Originally, articles were practice-based and described what simulation was and how it was being used by a specific group at a specific institution. As the field grew, the literature did as well, turning its focus to small scale studies comparing simulation to traditional clinical experiences. Later, simulation professionals self-analyzed their practice and began to look critically at how and why simulation was used in medical and nursing education (Durham et al., 2014). This became even more important as clinical experience opportunities for nursing students were becoming scarcer and simulation experiences were developed to replace these clinical hours. In order to justify the shift to simulation from traditional clinical hours, as well as the cost of the equipment and personnel needed, simulation needed to be validated as an effective and efficient means of teaching and learning (Hayden et al., 2012).

Outcomes of Simulation Use in Nursing

The research literature on simulation in nursing education in recent years has focused on evidence-based learning, where outcomes are measured and compared. Sometimes the comparisons are between the student outcomes by varying the number of simulation experiences (Shin, Park, & Kim, 2015), other times they are between one type of simulation and another (Jeffries & Rogers, 2007). However, most of the experimental studies are trying to measure an outcome of simulation and determine whether that outcome is significant to the learning of the students.

Nursing and other medical research fields strive to use evidence-based practice when educating the future generation of medical professionals (Issenberg et al., 2005). Evidence-based practice generally looks to outcomes-based studies where the effect of simulation on specific skills or processes can be measured. The two most commonly studied outcomes in the literature are clinical skills acquisition and critical thinking skills acquisition. Clinical skills include "…physical examination skills, practical procedures, communication skills, and treatment/therapeutic skills…" (Michels, Evans, & Blok, 2012, p. e580). Clinical skills tend to be quantitatively measurable and easy to define and observe and are therefore fairly simple to quantify for comparison between control and experimental groups. Clinical skills range from patient safety procedures (ex. identifying the patient, hand washing) to administering medication (ex. calculating dosage, oral versus intravenous) to performing procedures such as taking a medical history, listening to lung or heart sounds, or drawing blood from the patient (Hope et al., 2011; Michels et al., 2012). By contrast, critical thinking skills are "…interpretation or conclusion about a patient's needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient's response" (Tanner, 2006, p. 204). In the nursing literature, critical thinking skills are also referred to as clinical judgement skills (O'Donnell et al., 2014, p. 377) or problem solving or decision making skills (Tanner, 2006, p. 207). Perhaps not surprisingly, clinical skills outcomes, which are by nature usually apparent to a skilled third-party observer, are more clearly defined and assessed in the literature than critical

thinking skills. Critical thinking skills are usually interpreted through post-simulation questionnaires administered to the participants and/or instructors.

Nurses' clinical skills and clinical thinking skills are important to the safety, well-being and outcomes of patients in clinical situations. Patient safety is a great concern in the field of nursing, so much so that the Robert Wood Johnson Foundation created the Quality and Safety Education of Nurses (QSEN) in 2005 (QSEN, 2015). QSEN is a multi-phasic initiative designed to "enhance the ability of nursing faculty to effectively develop quality and safety competencies among graduates" by first "defining… quality and safety competencies for nursing education." Later phases piloted and delivered training to nursing faculty with the goal of bringing these competencies into nursing education programs in the Association's member schools ("About QSEN," 2016). As patient safety and care quality grew as a focus in the field of nursing, so did the research surrounding effective teaching methods to achieve those goals.

One study, which examined undergraduate pediatric nursing students' clinical skills, specifically patient safety related skills, were studied and documented by Bowling (2015). The resulting article, published in the *Journal of Pediatric Nursing*, describes a quasi-experimental study which compared student skills outcomes before and after a simulation event. The study's purpose was to "…identify if students' skill performance improved after midlevel fidelity simulations and paper/pencil case studies in the areas of patient identification, medication administration, and communicating using SBAR (situation, background, assessment, and recommendation)" (p. 439). Seventy-three students were randomly assigned by their pre-existing clinical groups to one of two

experiment groups: paper/pencil case study (comparison group) or midlevel fidelity simulation (experimental group). A pretest mini Objective Structured Clinical Examination (OSCE – pronounced OS-key) was given in the first week of clinical experience, which was also the students' orientation week. The posttest mini-OSCE was given during the third week of clinical experience. During the second week, the students participated in either the paper/pencil case study or the midlevel fidelity simulation. Both groups were allotted thirty minutes for the simulation and twenty minutes for a post-simulation debriefing session. The midlevel fidelity simulation group cared for a simulated pediatric patient in respiratory distress, while the paper/pencil group dealt with a case study of the same type, but unlike the midlevel fidelity group, they provided written intervention, they did not actively apply the intervention.

Bowling's study compared the results of the skills performance between the two groups of students. Results indicated a significant difference between pre and post tests for both groups, indicating skills were acquired by both groups. However, no significant difference was found between the posttest scores of the two groups, indicating that the method of educational intervention was not a significant factor in learning. In addition, the percentage of time that the students followed the correct procedure in practice even after the simulations was under fifty percent. The author's tone during discussion of the results of her study analysis indicates distress at the lack of mastery of patient safety skills, particularly the frequency of patient identification prior to treatment and the administration of medication. Although she acknowledges that other studies have shown students have the knowledge to perform patient care safely, they still do not always

follow proper procedures. Bowling notes: "Further research is needed to identify the barriers that prevent students from providing safe patient care" (Bowling, 2015, p. 445). Bowling points to a shift in nursing education from clinical skills to clinic reasoning and calls for a refocusing of nursing education to address "…students' mastery of nursing skills prior to focusing on mastery of clinical reasoning skills" (p. 446). As Bowling's research is current and timely, her conclusions represent the present thoughts in nursing simulation research – more is needed, much is still uncertain. This particular quantitative, outcomes-based study did not show the positive results that prior studies and meta-analyses (Cook, Hatala, Brydges, & et al., 2011; Shin et al., 2015) have shown. However, simulation is still growing and being used as an educational method for skills acquisition, and other studies have shown positive results.

Interestingly, the literature on simulation as an effective method of teaching critical thinking skills is even less positive than for clinical skills. Shinnick and Woo (2013) conducted a multi-site quasi-experimental study of 154 prelicensure nursing students' knowledge and critical thinking outcomes after simulation intervention. Individually, students at each of the three study sites participated in a simulated decompensated heart failure patient care scenario. Afterward, debriefing sessions were accomplished in student groups of five. Students took a pretest online using a tool known as the Health Sciences Reasoning Test (HSRT), participated in the simulation learning event, and then took the HSRT online a second time as a posttest. The HSRT is a multiple-choice question format test designed to measure critical thinking skills with scenarios set in a health care setting (Shinnick & Woo, 2013, p. 1063). The study's

authors also determined the students' learning styles via the Kolb Learning Style Inventory (LSI), measured their knowledge of heart failure intervention skills using a pre and posttest called the HF Clinical Knowledge Test, and evaluated their self-efficacy using a 12 item Likert-scale "…which measured responses to confidence in performing skills associated with those needed in acute heart failure" (p. 1064). As in other research studies in the nursing education literature, skills acquisition was measured, but also the perceived comfort level of performing the skill based on student responses. Studies such as this can capture students' perspectives, but through quantitative instruments and not through the students' own words.

Due to the number of tests and evaluation tools applied to the participants of this study, the students had up to two weeks after the simulation event to take the post HSRT test, in order to prevent test fatigue. After the data were analyzed, the authors found statistically significant gains in knowledge, but "…there were no statistically significant gains in CT" (Shinnick & Woo, 2013, p. 1064). In fact, there was a slight decrease in the HSRT post test scores, although this was not statistically significant. The authors were not surprised by their findings and even noted in the introduction that simulation "…has been suggested as a means of improving CT skills, (but) this remains unsubstantiated as findings among studies are not congruent and many relied on student or faculty perceptions of CT" (p. 1063). They conclude "....it is not surprising that a single HPS (simulation) had no effect on CT, as such skills may take years to accomplish and are likely to be due to a multitude of variables" (p. 1065). However, they did conclude that

simulation can be an effective learning modality, due to knowledge gained from the experience.

The contradictory and statistically insignificant outcomes of simulation are often noted in the medical and nursing education literature (Harder, 2010; Issenberg et al., 2005; McGaghie et al., 2010; Shin et al., 2015). For those studies that show improvement in clinical skills or even critical thinking skills (O'Donnell et al., 2014; Sullivan-Mann et al., 2009), others can be found that show little or no improvement (Bowling, 2015; O'Donnell et al., 2014) over traditional clinical teaching methods. There is even a concern that simulation "…may promote simulation of learning rather than learning by simulation" (Berragan, 2011, p. 661). In spite of uncertain or contradictory research however, simulation continues to grow in practice within those fields. What does not seem to be present in the literature are studies showing simulation as detrimental to learning. Simulation seems to be considered by medical educators to be as good as real clinical experiences for skills which require repeated practice and procedures. This is possibly due to the opportunity for students to repeat skills until mastery, something that is not normally possible in a real clinical setting. Discussions with simulation experts indicate that the use of simulation in nursing education may be market-driven as well. Nursing education consumers (potential students and their parents) expect to see simulators and well-equipped simulation facilities as part of current undergraduate nursing program facilities, just as engineering students expect to see laboratories for their work or art students expect studio space and resources (T. Wyatt, personal communication, October 13, 2015).

Evident in my review of the nursing education literature on simulation are themes surrounding skills acquisition using simulation to improve the learning outcomes of future nurses. Clinical skills and clinical judgement skills are necessary to be an effective nurse, and to safeguard patient safety in a clinical environment (Ewertsson, Allvin, Holmström, & Blomberg, 2015). The above studies illustrate how educators are testing and evaluating their simulation design for better outcomes. However, another strong theme in the literature is the design of the learning environment in which these scenarios and tasks take place.

Safe Environment in Nursing Literature and Student Perspective

The idea of safety in the learning environment is common in the field of adult learning. Knowles, et al. (2005), described a safe learning environment as encompassing "…physical comfort, mutual trust and respect, mutual helpfulness, freedom of expression, and acceptance of differences…" (Knowles et al., 2005, p. 93). In addition, both Transformative Learning (TL) theory and Reflective Practice (RP) mention safety as a foundational necessity for learning. In TL, "individuals engaged in transformative learning are open to change and therefore emotionally vulnerable…" and "…the importance of a safe, trusting, and respectful learning environment…" is the focus of the facilitator and participants in that learning method (Taylor & Cranton, 2012, p. 393). Likewise in RP, the emphasis is on psychological safety, although physical safety must also be considered. RP contains an element of expression of one's assumptions and inner thoughts, which are not normally exposed to others for their opinions. Only in a safe space or "container", it is argued, can multiple learners engage in RP together. In the RP

space, safety refers to honestly and trust development by the facilitator and participants toward each other and each others' ideas (Sherwood & Horton-Deutsch, 2012).

Simulation is often described as a "safe environment" (Bearnson & Wiker, 2005; Berragan, 2011; McGaghie et al., 2010; Shin et al., 2015) in nursing education literature. However, the safe environment referred to is usually one of patient safety (no risk of harm) rather than the psychological or academic safety of the participants of the simulation (Ganley & Linnard-Palmer, 2012). For many students, simulation is a time of anxiety and discomfort and although those potentially negative aspects of simulation are sometimes noted in passing, little research includes the experience of simulation from the participants' point of view (Durham et al., 2014). In studies which describe the learning environment of simulation beyond using the word "safe", other descriptors include "controlled" and "forgiving" (Issenberg et al., 2005, p. 21), "structured" and "supported" (Berragan, 2011, p. 661), that it is "safe to make mistakes" and "protected" (p. 662). Only a few recent studies go beyond simple descriptors and explore the learning environment of simulation more deeply.

Although simulation often relies heavily on technology "[s]imulation is an educational strategy, not a technology" (Levett-Jones et al., 2011). As such, both the instructor and the participants (students) need to find the learning environment helpful and supportive of teaching and learning. A recent study by Ganley and Linnard-Palmer (2012) addressed patient versus student safety in nursing simulations by studying what they term "academic safety" for students in simulation events (p. e50). Their definition of academic safety includes both physical and pscyhological safety for the students within

the learning environment. In order to add to the scant literature about student safety in simulation, the authors surveyed over one hundred undergraduate students and twenty four faculty in the San Fransico area to obtain their thoughts on academic safety in simulation and compare and contrast their answers. The survey was conducted online with Likert-type questions and open-ended questions asking students to describe a time they felt academically safe, a time they did not feel academically safe, and to provide their own definition of academic safety.

After analyzing the Likert-type question data from the survey, the authors discovered that "there was a significant difference in students' feelings of safety compared with the faculty perception of the students' feeling of safety…" (p. e52). Additionally, students described a safe learning environment as one where they are not judged or compared to others, where they are not ridiculed or embarrassed, where they are not anxious and can use their mistakes as learning opportunities. They also described a need for supportive, nonthreatening, helpful teachers. As part of the study, faculty were also asked to define a safe learning environment. Their comments focused on students being challenged but not threatened, supported and encouraged, and empowered within the learning environment (p. e53-e54). Alternatively, students reported they did not feel safe when they did not know what to expect, felt rushed or intimidated, and when they were being videotaped. They also did not feel safe when unprepared for the simulation and when being directly observed in action or observed from the control room of the simulation center (p. e54).

The authors discussed the differences in the students' and faculty members' perspectives on a safe learning environment in simulation. Specifically, they mentioned "students focused more narrowly on their personal experiences, and the faculty seemed to look at the experience from a broader perspective" (p. e56) They also associate academic safety for the students as a situation "conducive to learning" (p. e56). Although some limitations of the study were noted (small sample size, no idea of response rate due to online survey, need to review the data collection instrument), no mention was made of a potential bias that seemed to be built into the survey. In their desciption of the survey, the authors mentioned some of the questions asked on the Likert-type questions, which included questions such as "For me, the Sim Lab was a nonthreatening, academically safe environment" and "Practice in the Sim Lab was comfortable, easy, and a nonstressful learning environment" (p. e52). Those questions, answered prior to or at the same time as the open-ended questions asking for their definitions of a safe learning environment, seem to offer the students some pre-conceived ideas and terminology to use in their answers. It is possible the researchers' wording was co-opted by the students in their own defintions. This does not necessarily negate the study results, but is a factor to consider in further research.

Although there is general agreement in the research that simulation events should be a safe learning environment for both the patient and (recently) the participants, why is it important for students to feel safe while in a learning environment? Rudolph et al. (2014) explored this issue in their article "Establishing a Safe Container for Learning in Simulation: The Role of the Presimulation Briefing." These authors focus on the

students' psychological safety in learning and note psychological safety helps "…create a setting where learners feel safe enough to embrace being uncomfortable" (p. 340). They note that other studies show learning can be impeded if learners feel threatened or defensive about their actions however engagment in learning can be attained by instructor mediation, where support for trying and erring on the "edge of expertise" is available to the students (p. 399). The goal in this case is not to remove any feeling of risk or discomfort, but to create an environment which allows the students to feel comfortable with the risk and engaged with the learning opportunity in spite of their possible discomfort. This is what the authors call a "safe container" (p. 340).

Additionally, the student perspective in learning has become more important to adult educators in the last several decades. Rather than assuming adults are passive vessels to be filled with knowledge from an expert, most current and recent adult educators realize the need for student involvement in their own learning. Adults want to apply their learning, be active in their learning, and experience their learning (Fanning & Gaba, 2007). Simulation fulfills these needs with the added benefit of practicing skills for mastery or experimenting with procedures before putting them into practice. Effective simulation experiences require the participants to be active learners, and be responsible for their own learning to some degree. Ideally, participants are self-directed and self-motivated during the simulation activity which can lead to stronger ownership of the learning and the outcomes (Jeffries, 2005). In order to be effective in these goals, students' perspectives on their learning environment can be a valuable source of information on how well these goals are being achieved and what can be improved or

changed. Instead of "assuming that the meanings and significance we place… are the ones that students take from them" (Brookfield, 1995, p. 1), we should "continually research how it is experienced by students" (p. 10). This call to listen to students reflects my desire to explore how students view their simulation experiences.

Adult Learning Theory and Simulated Learning Environments

In Adult Learning literature, a learning environment is defined as "all of the physical surroundings, psychological or emotional conditions, and social or cultural influences affecting the growth and development of an adult engaged in an educational enterprise" (Hiemstra, 1991a). While studying learning environments and learning theory, I discovered the work of David Jonassen and his Constructivist Learning Environments (CLEs). CLEs are experiential learning environments, as described by Jonassen in his work in instructional design (1999). Constructivism, the foundation of his work, assumes "that knowledge is individually constructed and socially coconstructed by learners based on their interpretations of experiences in the world" (Jonassen, 1999, p. 217). In contrast, objectivism, often a traditional method of teaching students, assumes "that knowledge can be transferred from teachers or transmitted by technologies and aquired by learners" (p. 217). The main difference between the two ideals is the role of the student; passive in traditional objectivism, active in construtivism. Jonassen (1991) believed "objectivism and constructivism offer different perspectives on the learning process" and that they are "completmentary design tools" for designing learning environments (p. 217). Jonassen, who researched instructional design and computer-based learning, argues that CLEs can be framed by activity theory which posits that

"conscious learning emerges from activity (performance), not as a precursor to it" (Jonassen & Rohrer-Murphy, 1999, p. 62). As stated previously, Jonassen's CLEs include: "a problem-project space, related cases, information resources, cognitive tools, and conversation and collaboration tools" (Jonassen & Rohrer-Murphy, 1999, p. 69). These environments also include modeling, coaching, and scaffolding by instructors or facilitators in support of learning (Jonassen, 1999).

Activity theory, which informed Jonassens work, traces its roots back to Lev Vygotsky, Alexei Leont'ev, and the Russian scholars of the early 20th century. Over the decades, it has been explored, modified and refined and is commonly used as a model for human-computer interactions in research and practice today. Activity theory's focus is the "interaction of human activity and consciousness (the human mind as whole) within its relevant environmental context" (Jonassen & Rohrer-Murphy, 1999, p. 62). This is essential for designing CLEs, which are activity-oriented. To help in this design, activity theorists posit activity systems. Activity systems contain a subject (individual or group participating in the activity), an object (the physical or mental product that is the goal of the activity), tools (anything, physical or mental, used to transform the object), and actions (operations or tasks that are used transform the object) (Jonassen & Rohrer-Murphy, 1999, p. 63). In a nursing education simulation CLE for example, the subject would be the nursing student(s), the object could be proper patient safety procedures (washing hands, verifying patient identity, etc.), while the tools might be a high-fidelity manikin and associated medical equipment needed to complete the simulation. The

actions of the student(s) in the simulation would transform the object in order to reach the goal of the simulation (successful completion of the patient safety procedures).

Jonassen adapted Vygotsky's ideas of mediated learning and learning levels and applied them to adult education. However, acknowledging the work of Malcolm Knowles in the field of adult learning and his concepts of andragogy (Knowles, 1968) and student-centered learning (Knowles, 1973), Jonassen revised Vygotsky's ideal "well-defined" learning environments for his work with adults. Jonassen argued that *ill-defined* problems and a supported but open learning environment is best for adult learning, which developed into his CLEs model. Problems developed for students in CLEs should be as authentic as possible and Jonassen (1999) suggested that instructional developers of CLEs look to practicioners for real-world events from the field of study (p. 220). Research on simulation in nursing education bolsters the necessity of "authenticity" in development of problems or tasks in simulated scenarios (Sundler, Pettersson, & Berglund, p. 4) as well. When exposed to these simulated events or concepts, students should be able to manipulate and affect their environment and see the consequences of their actions. Learning, in Jonassen's view, was tool-mediated, where the tools were the means by which students moved themselves from one level of learning to another within the activity of the CLE. That is not to say instructors and teachers do not play an important role in his model as well. Instructors should be the coaches, the models and the ones who provide "scaffolding" to the learner's experience (Jonassen, 1999). Scaffolding can take many forms, but in general occurs outside of the actual learning environment and in some way assists the learning of the student within the actual learning environment

In simulation, this occurs before and after the simulation event in the form of pre-simulation work, prebriefing, orientation sessions, lectures, debriefing sessions after the simualation, and if necessary, repetition of the simulation itself (Levett-Jones et al., 2011; Rudolph et al., 2014). Scaffolding might also occur totally unseen by the participants within the learning environment by manipulation of simulation scenarios by instructors as the scenario unfolds to make something important in the scenario more obvious to students. Some direct coaching by instructors may also occur during the simulation, depending on the intended learning objectives. The goal of this learning model is to help the students reach a new level of knowledge and understanding through their experiences in the CLEs – in the case of nursing education, simulations. CLEs and similar learning environments can be liberating for students who enjoy active learning. However, they also can be a source for anxiety for those used to structure and traditional teaching methods.

My review of the nursing education literature has focused on the effectiveness of simulation as a teaching method for clinical skills and clinical judgement skills, simulation as a learning environment, and the importance of a safe learning environment for students. By viewing simulations as Constructivist Learning Environments, I am able to tie Jonassen's work on instructional design into the design of simulation from a different lens than most of the nursing education literature. While the nursing research literature focuses on evidence-based practice and designing simulation events to achieve the learning outcomes needed to educate tomorrow's skilled nurses, little research effort is focused on the students and how they interpret this new learning environment. For my

study, I will concentrate on the students and how they percieve this environment and its safety, linking that information to ideas for simulation design which incorporate what I learn from the students.

Chapter 3

Methodology

In this chapter, I will review my research question and the purpose of my study, and describe the method used for my study and the reasoning behind that choice of method. After establishing the purpose and method, I will discuss the participant population, the data collection process and the data analysis process. Lastly, I will explore trustworthiness as it pertains to my study and qualitative research in general and conclude the chapter with a summary of the methodology for this study.

Purpose and Research Question

This study addressed the following research question: How do undergraduate nursing students describe their experiences of safety during clinical nursing simulations? The purpose of this study was to better understand, from a student's perspective, how undergraduate nursing students describe a safe learning environment in clinical simulations from their experiences in these events. The students' voice will be heard through their own words and the meaning they derive from their simulation experiences.

Description of Method

This study was an interpretive qualitative study as described by Merriam (2009) and is an appropriate research method since I am interested in "how people interpret their experiences… how they construct their worlds and… what meaning they attribute to their experiences" (Merriam, 2009). These types of studies fit nicely within the epistemology of constructivism, which describes knowledge as constructed by learners through experiences (Jonassen, 1999, p. 217; Merriam & Bierema, 2014). Qualitative methods

allow researchers to "study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them" (Denzin & Lincoln, 2011, p. 3). Although phenomenology was explored as a possible qualitative method for this study, an interpretive qualitative study was ultimately chosen since my inquiry was not only about the students' experience (their voice) but also the context in which it occurs (the learning environment).

As a qualitative researcher, I collected the data in my study personally. Creswell (2014) refers to the researcher as a "key instrument" in the research process due to the fact the researcher generally gathers the study information herself rather than relying on instruments or other researchers (p. 185). The data collected in this study was from in-person, one on one interviews with students in the building in which they experience their simulation events. The interview location was chosen for comfort and also as a natural setting for the students; a place they are familiar with and connect to as a student (Creswell, 2014). Data also consisted of my field notes during and immediately after each interview. Since this data is from my perspective as the researcher, these additional notes helped me think reflexively about my role in the study, keep in mind the context and particulars of each interview, and helped me create a "holistic account" of the research question I was studying (Creswell, 2014, p. 186).

Through my program of study in adult learning, I have been exposed to different adult learning theories and epistemologies. In 2013, I penned my original personal epistemology; how I believe knowledge is constructed. That statement was: I believe knowledge is created by individuals but is socially and situationally influenced. That

statement is still accurate for me today, and therefore constructivism as an epistemology aligns closely with my personal beliefs about knowledge construction. As Denzin and Lincoln (2011) explain, "…we are shaped by our lived experiences, and these will always come out in the knowledge we generate as researchers and in the data generated by our subjects" (p. 104). Individuals may create knowledge alone or in groups, but there are always outside influences on them due to culture, prior experiences, and their current situations. As I explored how students experience their learning environments in simulation events, I used constructivism as a framework for my analysis of their words and meanings. My research strove to capture the students' experience in these environments and explored their reported feelings of safety in those particular situations.

Population and Sample

Before beginning this study, I gained permission from the Dean of the nursing school and the Chair of the undergraduate nursing programs to conduct the research study verbally and in writing (email). With the help of the Chair of the undergraduate programs, I determined which courses would contain students who fit the criteria for participants in my study, and settled on two courses with a total of approximately sixty senior students enrolled. I then contacted the course coordinator for each of these courses in person and asked their permission to contact students in class and via the University's Learning Management System (LMS) course site. I recorded the course coordinators' consent in a written, signed letter and submitted that to the IRB committee as part of my IRB application.

Participants in this study were a convenience sample of student volunteers from a large land-grant university in the southeastern United States. They were enrolled in a traditional undergraduate nursing degree program which employs simulation as a teaching method. Senior level nursing students in two courses with simulation events in the curriculum were asked to participate in one on one interviews lasting 30 to 60 minutes. Participants gave consent to be audio recorded and were compensated for their time with a $10 gift card to a national chain coffee shop. Nursing students have many demands on their time and I believed this incentive was warranted to help recruit participants. In addition, I truly appreciated their assistance with this study and wanted to thank them. The study research was conducted after Institutional Review Board (IRB) for human subjects approval with data collection conducted early in the spring semester of 2016 (February), which coincided with participant availability and timing of simulation events in their courses. Each participant had previously participated in at least one simulation event before being interviewed.

I conducted one exploratory interview, not to be included in this study, in spring 2015 with a senior level student whom I knew personally. This student had participated in simulation events at both the junior and senior level and was on the verge of graduating with a Bachelor of Science in Nursing (BSN). The interview was held in a reserved study room in the university library and lasted approximately one hour. The student gave consent for the interview to be recorded and the interview content was audio recorded. After the interview, the recording was reviewed but not transcribed. The interview questions focused on the experience of this student in a simulation debriefing

session, not the entire simulation event and therefore is not pertinent to this particular study. From this interview I determined the library is not a good site for interviews, even in individual study rooms; there are too many distractions and the people involved in the interview are viewable through the glass walls of the study room. The main purpose of this initial interview was to practice my interviewing skills and the procedure for a valid interview, but I also learned that undergraduate nursing students can be more forthcoming about their learning than I assumed prior to the pilot interview.

Instrumentation and Procedure

Since the targeted courses met only on Mondays, I contacted students the first Monday lecture after IRB approval. During a class break, I introduced myself and the study and answered any questions the students had at that time. I told them how to sign up and asked the instructor to post a link to the sign-up sheet in the announcements section of the LMS course site. From that initial solicitation, I received four volunteers. The next Monday, I was able to speak in class again, review my study, and again ask for volunteers and remind them of the sign up process. From that second solicitation, I received nine more volunteers.

Once students began signing up to be interviewed, I contacted each individually via their preferred contact method (email, text or phone call) to set up an interview time. I coordinated their available times with the schedule for the room where the interviews were to take place to find appropriate times to meet. Once a date and time was set, I sent each student a copy of the informed consent sheet to review at least one day before the scheduled interview. For each interview, I arrived early at the interview site, posted signs

on the door asking not to be disturbed, and laid out the printed informed consent document for the student, along with a pen. As the individual student arrived, I called them by their real first name and then introduced myself and asked them about their day to that point. I thanked them for coming and offered them a bottle of water and gave them a few minutes to settle in, re-read the informed consent document, and sign that document. After they signed, I asked them to pick a pseudonym for this study and asked them to choose where to sit in the room as I shut the door to the room. I wrote the pseudonym and the date and time at the top of the interview protocol sheet I printed for each interview. After we were both settled comfortably on the couches or at the table in the basement apartment, I turned on the audio recorder and began the interview. During the interview, I originally intended to take notes on my interview protocol sheet. However, after the first and second interview, I decided to commit phrases and wording to memory in order to prompt additional responses with follow-up questions. I found that whenever I looked down or started writing on the paper during the interview, the students would stop talking, as if politely waiting for me to finish what I was writing. Since I did not want them to stop talking, I abandoned the note-taking within the interview and relied on my memory and mental notes to craft appropriate follow-up questions. At the conclusion of the interview, I thanked them, turned off the recorder, and gave them a gift card as thanks. While cleaning up, taking down signs, and gathering belongings, the students and I would chat about their own research studies, their coursework, or about simulation in general. I conducted four interviews the first week and nine the second, completing my data collection in two weeks.

Although my data collection spanned two weeks, while still conducting interviews, I began transcribing early interviews and forming preliminary ideas about what the students were saying pertaining to simulation experiences and safe learning environments before the completion of all the interviews. Merriam (2009) notes that this simultaneous collection and analyzation of data is the preferred way of handling data in a qualitative study (p. 171). I found this process to be natural and helpful, especially with the time constraints placed on the window for interviewing. I planned to complete all interviews prior to the University's spring break, when the students would leave campus for a full week and be unavailable for interviews, and was able to meet this self-imposed deadline. After the first interview, I realized I might need to ask the participants more in-depth or probing questions to bring out their thoughts of a safe learning environment other than physical safety or patient safety. Between interviews, I documented questions I wanted to ask future participants and noted common trends and ideas about the data that began forming early on. I began to use one of my follow up questions which specifically asked students about psychological, emotional, or academic safety. When asked for clarification of these terms, I did not give a definition of these types of safety but asked the student to define them or explore what they thought they meant. This line of questioning seemed to work well and students spoke at length about their thoughts of those kinds of safety in learning. Even with just two weeks of interviews, early reflections in the first week and the practice of one on one interviewing helped me improve my interviewing skills and focus my follow up questions on ideas or phrases that kept recurring in the interviews.

Interviews were audio recorded and transcribed by the researcher. As students volunteered quickly and I was able to arranged interview times with them almost immediately, data collection was completed quickly. By the end of the first week and the completion of the fourth interview, commonalities were emerging. The pause of a weekend between the first four interviews and the second nine allowed me to begin transcription of the first interviews and form preliminary ideas about the data. Early in the second week of interviews, I believed I had reached saturation and debated canceling the last few interviews. Saturation refers to the point in data collection and analysis when "gathering fresh data no longer sparks new insights" or reveals new themes or categories (Creswell, 2014, p. 189). Assuming some students would need to cancel or re-schedule, I scheduled each interview quickly and had already scheduled all thirteen interviews by the time I felt saturation had been reached. No student missed an appointment or re-scheduled however, and I decided to continue with the interviews and collect additional data to help deepen my understanding of their experiences and opinions.

Data Analysis

All data, including audio recordings, transcripts, and data analysis files, were stored on a password protected computer and backed up to a FERPA compliant storage location. All personally identifying information for each participant was removed and data were analyzed and presented anonymously. I asked interview questions about both experience and context during our session. I also noted any impressions I had before, during or after the interview in my field notes. All paper documents, including the signed

informed consent forms, interview protocol sheets, and interview or field note transcripts are locked in my office on campus when not in use for interviews or data analysis

After data from the first four interviews were collected and transcribed, I formulated some rough ideas as to the data and recorded those ideas in my field notes. However, I did not begin formal coding until all interviews had been conducted. As I transcribed the interviews, I labeled each audio and transcription file with the number of the interview (D1-D13) and the pseudonym of the interviewee. My field note transcript files were also labeled this way with the addition of "Field Notes" in the document title. With this system I was able to keep the interview audio files and transcripts organized in a logical way.

The week after finishing the interviews and while still transcribing the later interviews, I met with another qualitative researcher to analyze and code an interview transcript together. After the outside researcher signed a non-disclosure agreement, we each coded a paper copy of the transcript of the first interview separately. During that same meeting, we reviewed our individual coding together to create a master coded document for that interview with common phrases and ideas that caught our attention during our individual analyzation. Our meeting served as the investigator triangulation or triangulation analysis. Patton (2002) suggested two or more people independently analyze the same qualitative data (in this case the first student interview transcript) and compare their findings, to improve the trustworthiness of the data analysis (p. 247). After this meeting and co-analysis, I completed the transcriptions of the later interviews and began coding all interviews and field notes.

To accomplish the coding, I printed each interview transcript and field note transcript and manually analyzed and coded those using notes in the margin of the pages. I kept the master copy of the first interview as a reference, and my research question and purpose in front of me while I coded each document. Originally, I planned to use computer assisted qualitative data analysis software (CAQDAS) such as NVivo to accomplish this process, but decided to manually code instead. Although the advantages of using a computer assisted coding program are speed and ease of searching (Creswell, 2014), I found the training available on NVivo from my University inadequate to answer my questions about the software and the time I had to learn the software prohibitive for its use. Manual coding worked well and was not overly time-intensive.

After initial coding of each document, I created index card summaries of each transcript, a sort of flash card that contained my analysis of the main ideas expressed by each student or in my field notes. Creating these cards required me to think about each meaningful phrase or idea and was inductive, and therefore the codes were "obtained gradually from the data" (Pope, Ziebland, & Mays, 2000, p. 114). As I created these cards, I began reducing the ideas on them into the themes I eventually formed in Chapter 4. These cards, and referencing the original transcripts when needed, became the basis for brainstorming on a whiteboard with various categories and organization of themes and phrases as I finalized analysis of the data.

Trustworthiness

For research to be valid and applicable to a field of study, it must produce trustworthy results or findings. Trustworthiness in qualitative research is assessed

differently than in quantitative research, although some similar language may be used. There are several models for trustworthiness assessment in qualitative research studies but the model put forth by Guba (1981) and extensively reviewed by Krefting (1991) focuses on four aspects of trustworthiness that can be applied to both qualitative and quantitative research. Those four qualities are: truth value, applicability, consistency, and neutrality (Krefting, 1991). Truth value, also called "credibility" (Lincoln & Guba, 1985), is a measure of the researcher's confidence that the findings in his or her research are true "based on the research design, informants, and context" (Krefting, 1991). In my study, credibility was created by developing accurate descriptions and interpretations of the students' experience via their words from our interviews. My goal was to describe a situation that others, who have shared a similar experience, would recognize upon reading.

Unlike most quantitative studies, the applicability of a qualitative study is not always a valid measure of the trustworthiness of the study. Applicability in quantitative studies refers to the ability to apply a finding in one population sample to a larger population. In qualitative studies, this is often not the case and the researcher may state that his or her research findings should only be viewed as valid for a particular group of people. However, Lincoln and Guba (1985) argue that transferability of a study is the responsibility of the researcher who comes after the original study and the original researcher must only present "sufficient descriptive data to allow comparison" (Krefting, 1991, p. 216) to achieve applicability. Since my study was an interpretive study based on

participant interviews and field notes, my data is descriptive in nature and the "data are of descriptive worth in and of themselves" (p. 220).

Consistency in quantitative research can be achieved via the controlled environments of the research design. In qualitative research, "variability is expected" and "consistency is defined in terms of dependability" (Krefting, 1991, p. 216). In my study, I expected variation in the students' experiences of simulation learning environments, and strove to describe commonalities. However, since I interviewed people with a range of experiences, I expected differences in descriptions. Although the normal data are reported and analyzed, the "outliers" are important to the findings as well. Consistency was found in the similarities rather than in seeking identical outcomes from all participants.

Lastly, neutrality, or lack of bias, is sought in both quantitative and qualitative research design. Qualitative researchers can achieve this through the neutrality of their data, rather than through researcher neutrality. True researcher neutrality, devoid of personal bias, is often considered impossible in qualitative research (Diebel, 2008, p. 556). Data neutrality, however, can be determined via an audit of the data collection and analysis process (Krefting, 1991, p. 221). In my study, this audit was conducted with the university via the IRB application approval process. Additionally, I kept an audit trail of data collection and analysis in order to make my research process as transparent as possible. In my dissertation, chapter four presents my findings from this analysis and chapter five discusses these findings.

Conclusion

As Brookfield (2014) noted: “One of the hardest things teachers have to learn is that the sincerity of their intentions does not guarantee the purity of their practice” (p. 1). Teachers, he argues, can improve their teaching if they consider student perspectives. Berragan (2011), a RN and PhD researcher in the United Kingdom echoes this in slightly different terms in reference to simulation in nursing education which, “deliberately places the student’s needs at the centre of attention and provides the opportunity to create conditions of best practice for teaching” (p. 662). With that in mind, I approached the research and design of this study with undergraduate nursing students, whose voices are not often heard in the realm of nursing education research.

Chapter 4

Findings

The purpose of this study was to better understand, from a student's perspective, how undergraduate nursing students describe a safe learning environment in clinical simulations from their experiences in these events. In this chapter the findings are organized into two main sections: a general description of the students' simulation experiences, and a thematic analysis of simulation as a safe learning environment. This thematic analysis includes the various categories developed from the participants' words which support the main theme of these findings: *ok to make mistakes.* Beginning with the general simulation experience descriptions allows the reader to become familiar with simulation as it pertains to this study and how the students describe simulation. According to the participants, the descriptions and opinions the participants expressed in their interviews were of experiences that left lasting impressions on them as nursing students.

Students' Descriptions of the Simulation Experience

The participants were first asked to describe their experiences in simulation or lead me through a typical simulation experience from their point of view. One participant, Emily, had the following to say when asked to describe her experience of simulation events in her program:

> [W]e will have usually about 2 to 4 students depending on the class size or what exactly they want us to do. Most recently was our smallest one that we've done, or that I've done and it was just me and another student. We usually go in, we will

> it's, it's entirely recorded, there'll be a prompt that we will read once we get into the room out loud for everyone to hear. And then as soon as we've finished the prompt you're pretty much expected to go, begin the scenario. So, this semester we've had family in the room so that's been a new dynamic to actually deal with a real person on top of the manikin, the simulation guy, the person. And there'll be some type of critical thinking, you do. You know, you assess them, have to check the MAR (medication administration record), labs, whatever is needed, and then usually you are expected to call out to, make a phone call and whether that is to the lab, to the pharmacy, to a doctor to come in. Something like that. So incorporate it as if it is similar to real life.

Lillian expanded on this general overview and gave a specific example of a recent scenario in which she was a participant:

> The last scenario I was in was a mother-baby clinical simulation and it was simulating taking care of the mom and baby immediately postpartum. So, mom delivered when we walked into the room in the scenario and so there's a real live person acting as the mom. And then the baby was a manikin. And so myself and another nursing student were in the role of baby nurse if you will, so assessing, doing the immediate assessment of the newborn using Apgar scoring and then from that trying to discern what we needed to do, if we needed to do any interventions. In that scenario, the infant wasn't breathing, wasn't crying, and so we did a rapid Apgar assessment and realized we needed to do some interventions. And so, we stimulated the newborn, and at the same time as all that

> is going on, the mom, the real life mom, is acting like a mom would in a real life situation and [is] concerned about the child. And so you kind of had to, as a student, do both roles of patient interaction and talking with mom at the same time as caring for this newborn that's not breathing…. So, that's what that scenario was about.

Not all of the participants used neutral language when first describing a simulation event. From this introductory question, some students used color words, words which evoke emotion and "tell the reader how to feel" (Rubin & Rubin, 2012). The use of highly emotional language to describe their experiences continued throughout the interviews. These were very powerful words and the students often repeated those words other interviewees had chosen. Caitlin, a female classmate, talked about her anxiety in simulation experiences in her first responses: "I get really anxious knowing that I'm going to be forced to do something." Sarah, expressed her feelings of nervousness in her initial description:

> For me as a student, when I'm going into simulation I'm usually a little nervous because I know it's going to be situation that I haven't been put in before most likely in the actual clinical setting. And I know that my instructors are watching me and kind of to see how I do in those situations.

Other students also described going into the simulation "blind" or being "blindsided" by the experience. David, one of two male interviewees and the only 5th year senior in the study, mentioned: "to me it's kind of like we're blindsided. We have, we have no idea what to really expect except the general topic for like, if we're in our pediatric class we'll

probably do something related to pediatrics and children….” Laurel’s first sentence when asked to describe her experiences in simulation was echoed by others. She states: “Well, it’s very nerve-wracking” before continuing with a short description of the events. I was struck by the fact that even before questioning their thoughts on safety in a simulation environment, students alluded to their psychological safety, or lack thereof, in their initial experience descriptions.

According to the data analysis, students are aware that in simulation events they will be put in situations that are more dangerous than they would encounter as a student in a clinical setting. As Alisa noted, “[Simulation is] a way of easing us into difficult situations, that we’re gonna face, and situations that, as students, we don’t get to participate in necessarily in the hospital. [For example], we do (life-threatening) codes and stuff.” In simulation events, they are acting in the role of primary nurse, which is unlike their role of student nurse in all other practice environments. There is no mentor, no head nurse, no instructor to give them guidance, tell them what to do (or what not to do), and the care of the patient is entirely in their hands. One participant, John, describes these situations as “engaging… but challenging” and says they provide an opportunity to “let the students… take the role as the main providers.” This role elevation makes simulation a unique part of their learning process since they are afforded opportunities to step out of their role of student and perform as the nurses they will become in the future.

The students’ general descriptions of their experiences in simulation were a rich foundation on which to build a thematic analysis. Their emotional and psychological feelings of safety were apparent within the general descriptions even before they were

asked specifically about safety. Introducing these initial descriptions helps establish their frames of references and provides a background for the upcoming theme and categories their words created.

Thematic Analysis

After inquiring about their experiences in simulation events in general, participants were then asked about the focus of this study—to better understand, from a student's perspective, how undergraduate nursing students describe a safe learning environment in clinical simulations from their experiences in these events. The overarching theme that emerged from the data, I call *ok to make mistakes*. This phrase, which was evident in one form or another in all the interview responses, refers to the students' comfort level within the simulation learning environment. Several environmental themes influenced the theme *ok to make mistakes* including: *nerve-wracking and blindsided* (which encompassed several sub-themes), *instructor interventions/instructor discord, being watched/comfortable with each other, do no harm,* and *it gets better.* In this section, each theme is stated, an example quote given to illustrate that theme, and an analysis of the theme described below.

Nerve-wracking and Blindsided

It can be nerve-wracking, at first you don't know what to expect. – Suzanne

Several sub-themes combine to create the theme *nerve-wracking and blindsided*. These sub-themes, which display the students' emotional reactions to their simulation preparation and experiences, are: *uncertain expectations, prepared/unprepared,* and

orientation/lack of orientation. An example of each sub-theme from the interviews and an explanation of each is below.

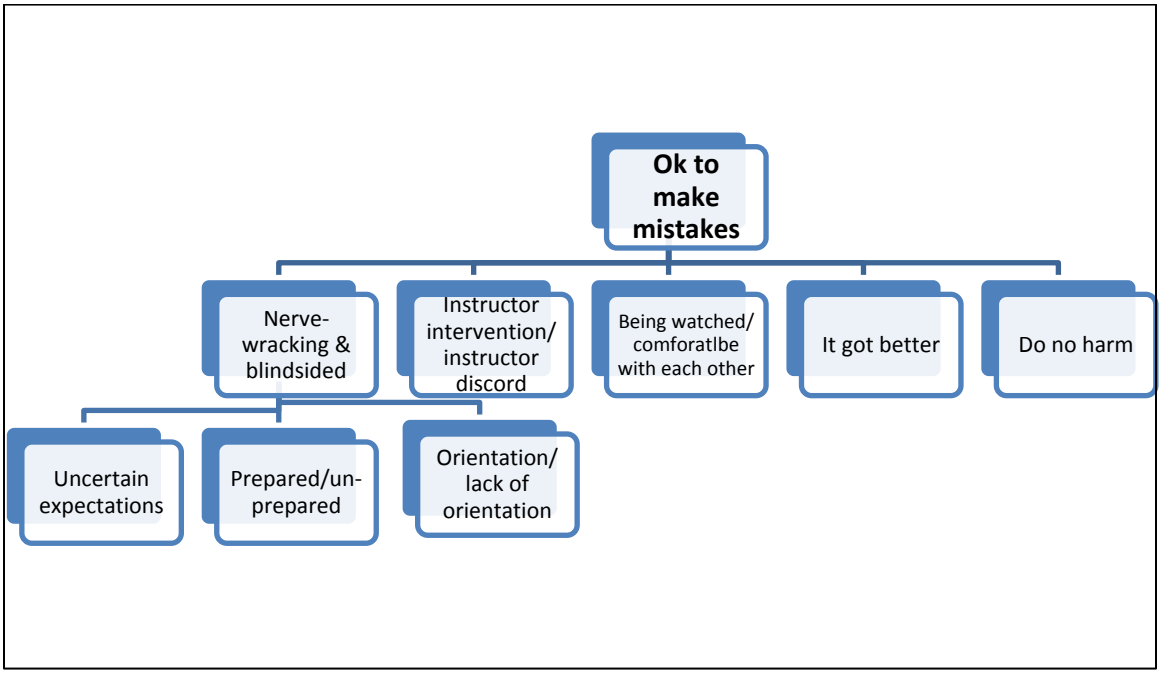

Figure 2. Themes

Sub-theme 1: *Uncertain Expectations*

I don't think any of us knew… what to expect in simulation or what would be expected of us… - Lillian

Participants in this study spoke at length about expectations in simulation and how uncertain expectations led to anxiety, worry and fear. This was evident from the very first interview, but a later participant, Lillian, put it in these words:

> …our first simulation or maybe first two or three, I don't remember, psychologically did not feel like a safe environment because… I don't think any

> of us knew… what to expect in simulation or what would be expected of us or how much we needed to prepare outside of just our normal coursework of studying. And so our first simulation, I just remember kind of feeling like a bug under a magnifying glass... “

Additionally, Monica describes how not knowing what to expect and possibly misguided self-expectations affected her simulation experiences: “Initially, junior year they were, I think more terrifying than they were (laughs) just not knowing what to expect and have… and I, I think I expected high expectations, not to mess up.” However, Suzanne put a positive spin on the stress of uncertain expectations, noting that the uncertainty helps her learn to manage the stress of nursing.

> It can be nerve-wracking, at first you don’t know what to expect. But it really does when something stressful happens or something you don’t expect in real life nursing, it comes in handy and helps you be able to manage the stress that comes along with nursing. It really does help me feel more prepared than just reading from a textbook or hearing a lecture. Hands on I think is really important part of nursing, just so you feel prepared and know what you’re doing.

Even when explicitly told they weren’t being graded, the expectation of punishment or consequences led to a feeling of unease. The first student interviewed (Jennifer) brought up the fact simulation events are not graded in her interview, but that the instructors were still there to critique their performances and expect them to know what to do. Jennifer says:

> not that we're getting a grade, but just the thought that, you know, the thought in the back of my mind, oh they taught us these things, we should know these things, they know definitely what's right and what's wrong and they're our ultimate critic.

She understands there is no grade attached, and yet is always aware that she is being evaluated on how she reacts in the simulation event. In another interview, John acknowledges his feelings about the lack of grades in simulation, pointing out what he views as a positive result of the grading system:

> It's not something that they are using to grade how good you are at nursing school, they're using it to make you a better nurse. So that's a big, big factor for me…. they really emphasize that it's not something that they're grading, it's not something that we should be worried about judgement about.

Other students used the word "threatened" to describe their experiences with expectations in simulation. Sarah expanded on this when asked to describe a safe learning environment:

> So I guess, if somebody were to say 'don't mess up' or 'we're expecting you to know how to do this, we're expecting that you'll get this right the first time' anything like that would make me feel, kind of threatened. Like oh crap if I don't do this right you know what's gonna happen? So I guess the opposite of that would be, instructors you know, being very positive and saying 'it's ok to make mistakes, we don't expect you to get this right the first time, it's ok if you don't

remember how to do something that we've taught you before'. Things like that I guess would make it feel safer, just like reassurance.

Many of the other students interviewed expressed similar feelings to the ones quoted above about uncertain expectations, misunderstood expectations, or unspoken expectations. They felt anxious when they did not know what was expected of them or what to expect in simulation situations. However, they also expressed feeling safe and even understanding why they were kept in the dark about certain aspects of their simulation training. This expectation theme flows directly into the next sub-finding which deals with preparation.

Sub-theme 2: Prepared/Unprepared

I feel comfortable, I feel prepared. I feel that my instructors have prepared me to be in that learning environment. - Sarah

Adding to the theme of comfort level, students also expressed that prior knowledge of the simulation environment and topic were valuable to their feelings of safety in learning. They often talked about feeling prepared or unprepared or described their attempts to prepare for simulation. To Jennifer, simulation "…almost feels like a final or some kind of intense thing" but the students repeatedly mentioned not having knowledge of what the simulation would be beyond a general topic, not feeling prepared. For example, if they were in a pediatrics class, the simulation would be about a child, but information about what disease or problem the child might exhibit in the simulation scenario was not shared prior to class. Additionally, students who might already have participated in that scenario are sworn to secrecy and unable to share their experiences

with their classmates. David notes: “[we] sign the consent forms that we’re not allowed to talk to anyone or say anything about it to keep the whole simulation going… leaving it to where no one knows what to expect….”

Sub-theme 3: Orientation/Lack of Orientation

The teachers have oriented us to the unit, so to me that’s… safe - Emily

Another aspect of preparation that became apparent through the interviews is a theme I will call “orientation.” Orientation is comfort with the physical space and confidence in what the student knows about that space. Students noted that orientation was achieved mainly by building familiarity with the learning space (the high-fidelity simulation lab) and was usually facilitated by their instructors or the simulation coordinator. As Emily puts it:

> We know all the equipment that’s up there, we might not know how to use all of it, but like we know what it is, we know where stuff is. And the teachers have oriented us to the unit, so to me it’s safe all the supplies that we use and things - we’ve been taught how to be safe with them. Like the sharps and everything. So it’s comfortable in the sense that the environment feels safe to me.

Physical orientation included the physical layout of the room including where items were in the room, which Lillian gave an example of her instructors “…pointing out things, this is where this cart is with medications if you need it, this is here, this is here."

Orientation to the learning scenario was achieved through the pre-simulation materials the students consumed from the learning management system (LMS) or the lectures they attended. Sarah notes that when:

> the instructors give us stuff on [the LMS] to look at beforehand and to read beforehand and kind of, I mean it's probably kind of going to deal with what the simulation is then I feel more prepared. So they've done that this year really well, and given us stuff to read before.

Although this knowledge did not extend to knowing what the scenario would be about specifically, the students expressed confidence in their preparation or knowledge due to the preparations they made prior to simulation events. As the example quote for this subtheme from Sarah relays: "I feel comfortable, I feel prepared. I feel that my instructors have prepared me to be in that learning environment."

Nerve-wracking and blindsided is a theme full of nuances and meaning. Each of the sub-themes, *uncertain expectations, prepared/unprepared,* and *orientation/lack of orientation* built upon each other to form the greater theme encompassing them all. The words of the students, repeating "nerve-wracking" and the color word "blindsided" summed up their feelings into this first theme.

Instructor Interventions/Instructor Discord

I've had really great nurses with me this whole time. It's made me really feel comfortable doing things - Alisa

Another aspect of how safety in the learning environment may be created for students in simulation events is the theme "instructor interventions." Instructor interventions come about when instructors, mentors, preceptors and other faculty nurses realize a student needs more practice at a certain skill. David relates a time when:

> I wasn't really good at manual vital signs and my instructor pulled me aside during clinicals and had me go to practice vital signs on her and another person, before I went and did it on my patient. And that's something that I felt… better in that situation because it makes me feel comfortable to approach an actual human and do vitals.

Even if the interventions were not directed at a specific student, some participants mentioned that the instructors were open to answering questions, did not make them feel dumb, gave constructive criticism and had a positive attitude. Suzanne uses the term "trust" to describe the instructor/student relationship in simulation: "I feel comfortable approaching teachers… We trust them and they trust us…." Alisa, when asked, described her safe learning environment and included her instructors in it:

> Well of course whenever you're in nursing school you're scared you know to touch the patient. I think your teachers being there and being with you in the room and like having a positive attitude about, like I mean we don't know everything. Gosh, I'm sure in 20 years I won't know everything either. So just having the teachers there with you, the nurses that are understanding and that want to help you learn. Making you feel comfortable you know doing things that we've learned in the classroom setting, obviously we're going to be nervous the first time doing it on a real patient, but yeah just having the positive attitudes around you, and nurses that want to help you, which I've had really great nurses with me this whole time. It's made me really feel comfortable doing things, asking

> questions, you need to be able to ask questions, because we've all got tons of them.

However, one student (Emily) noted a time when instructors made her feel unsafe. She tells her story:

> In terms of not safe, there's like one or there was one time two teachers got into an argument about the simulation and it was in front of everybody. We were all in the classroom but we could hear them arguing and they started shouting and it was really awkward and unprofessional. And that was kind of weird because then the simulation, our two groups, ended up doing different things because they couldn't agree on what was supposed to be happening… you feel really awkward when your teachers don't get along and they can't make a decision and then you hear like their whole argument. It made me a little uncomfortable to do the simulation in front of them because I knew one of them was mad about the way we were doing it and the other was ok with it. And then the other group had the opposite problem like one of them liked how they were doing it and the other one was mad about it.

Knowing they have mentors and experienced nurses who have been through this before and are there to help them learn, allows students to feel comfortable enough to make mistakes. Discord, however, can make a lasting impression on a student and distract from the simulation experience.

> *Being watched/comfortable with each other*

I'm being watched…even more [than] being watched, I'm being recorded - *Monica*

I feel like our major's pretty small so a lot of us are pretty comfortable with each other. - Alisa

There are 109 senior nursing students in the class of 2016 (C Shaffer, personal communication, 4/12/2016) for this particular program. Due to class size and limited space and resources, simulation events involve groups of students, up to fifteen people at a time. Emily describes the impact this has on her experience in simulation:

> Like my first simulation junior year, I was a mess (laughs) especially because I think we had 12 or 15 people watching that one. But then the groups have gotten smaller and I know the girls and occasional guy better, I know the other students better so I feel more comfortable working with them or making mistakes around them.

Students expressed safety in being respected by their peers and getting positive or constructive feedback from peers and instructors. Many noted the growth of friendships or greater familiarity with the people in their major over the two year program and how that structure helps within a simulation event. Laurel notes:

> It helps to know the other students that are there with you. So they pair us off with our clinical groups usually, so that helps make it feel more safe, just having people you're familiar with and know how to work with.

The most negative aspects of the social side of simulation safety included comments about "being watched" and recorded. When asked about ways to make simulation a safer learning environment for nursing students, Jennifer responded:

> [D]efinitely keep with the smaller groups, and not necessarily having everybody watch everybody. Because I think… it's good that your friends can give you pointers, but I think you're more likely to have people talk to other peers and stuff about errors or what have you.

Additionally, Alisa noted how the social setting holds her accountable for her actions in simulation events: "It's nice to have the feedback from your teachers and also from your peers. Because I mean, I know if I do something wrong and somebody calls me out on it I'm probably not going to do it wrong again." However Rachel talked about a strange phenomenon where people in simulation forgot to put on gloves, something she says rarely happens in real clinical settings. She attributed it to: "part of its panic because you're just freaking out because they're watching you up there…"

"Being watched" was a major issue which detracted from their feeling of comfort for the students according to their comments. Jennifer mentioned it in the first interview I conducted. Her first comments when asked to describe a safe learning environment were:

> I felt very secure and safe. There have been smaller groups which I like, and I like when we're not being watched by our peers in a separate room. I think last, last year, we did that and it was kind of nerve-wracking just knowing you're being watched from another room…. I had a simulation last week or the week before and it was … very small, very kind of one on one. You got to think through things more and I felt more secure with not as large of a group and not being watched by literally everybody in the class.

Lillian, when asked to describe how simulation is or is not a safe learning environment from her experiences, had this to say: “So I think the first few simulations didn’t feel like a safe environment because I felt watched and then errors pointed out and then questioned... [It] almost made me question my competency, even as a nursing student…” Later however, she describes how watching, being an observer, helps her in simulation: “I was watching my peers do the preeclampsia situation. And I felt glad that I was just an observer, because I was able to absorb and learn everything from mistakes that they were making. And things that they did right.” This simulation event, dealing with preeclampsia, was mentioned by about half the students as a situation where they did not feel prepared prior to the simulation event. In Lillian’s case, she was able to watch the first group, and prepare herself better for her turn in the simulation. John agrees that watching others in simulation, even being recorded, is a good thing:

> I think that it’s great how it’s videoed and you can watch other groups go, different situations. Being in that other room, I think it’s good that rather than everybody be in the actual room watching. It makes it less stressful and not as crowded for the people that are performing the situation.

The students spoke of their simulations in a very personal manner. Language about their peers, especially about the size and makeup of their simulation groups and about their peers watching them, appeared in every interview. For a very few (Alisa, John), what their peers saw or said or thought did not seem to bother them, although they both said they understood how it could bother others. But for the rest, the perception of

them by their peers, was important. They point to smaller groups consisting of peers from their clinical groups as one way to create a safer learning environment.

Do no harm

I think that our first concern is usually the safety of the patient. – John

Simulation events allow nursing students to work outside of normal restrictions found in clinical and hospital settings – but with a safety net in place. They are able to make mistakes while maintaining the safety of their patients, their peers, and their selves. Most participants seemed to assume physical safety as a given on the university campus, in the buildings, and in their learning environments in general. But in nursing, the safety of patients is paramount. To the participants, physical safety in their simulation environments was in reference to the physical safety of human patients, since the main actor in a simulation event is a human analog manikin. They were able to make mistakes because they knew they were doing no harm. John described how he views the safety of a simulation environment in this way: "…as a nursing student we're really concerned about our patients, so the fact that the patient that we're operating on is not an actual person, that is the ultimate safe environment." Emily described a safe learning environment in simulation in the following way:

> For nursing especially I think it means that we're not hurting real people because that's so easy to do, especially since we're so new at everything. To me the simulation is a safe learning environment because if you have an idea you can try it and if really messes up then you know, (laughs) that's ok. Because a lot of the scenarios or a lot of the simulations, we get a do over. And like other students will

> do a do over so you can see better ways to do things… So it's comfortable in the sense that… the environment feels safe to me.

Students know the simulation is not real and expressed that in the interviews by using words such as "pretend" (Leslie, Caitlin), and referring to the manikins as "fake patients" (Leslie) or "dummies" (Caitlin, Alisa, John) but the very fact they are able to practice on these human analogs enables an environment where they are comfortable making mistakes. Monica describes a safe environment where she can do no (real) harm in this way:

> [F]or me that would be just the ability to learn about, learn on your own mistakes, be able to make mistakes and be able to say ok what I can do to improve them without (chuckles) harming someone else. So obviously these are not real people that we're working with and I can, if I had to give them an overdose and been able to be like oh my gosh this is something that I need to make sure I don't do that again. And I obviously didn't hurt them.

This idea of patient safety, along with the other themes mentioned above, form the foundation for a safe learning environment in simulation, as described by students in that learning environment. As the data analysis shows, preparation, orientation, their instructors and peers or groups affected their feelings of safety; they also often talked about a progression of feeling over time that lead to the last theme, understanding.

It got better

It's progressively gotten better for me. – Monica

Initially, student describe simulation as a scary unknown. They may know what it is and what the purpose is, but they have no experience with it and do not know how they will be affected by it – personally or academically. However, over time, they spoke of a progression in their attitude and comfort level in simulation. I paraphrased what several of the students said and call this *it got better*. Caitlin expressed this thought when she said:

> The thing I will say is that it has gotten better throughout simulation. So junior year when we started it, my first simulation went awful. There was too many of us in the room … and it kind of had that bystander effect of like 'oh you can handle that because there's 4 people in the room' [and] 'she can do that, I'm just gonna stand here and hold the puke bucket' or something like that, you know? (laughs) But as they've gone on they have gotten better and I think that's me being more confident or just blocking out the fact that I'm being recorded in simulation.

Monica agrees and says "there's been a progression for me with my exposure to simulation", explaining:

> But as I've been able to come back each semester and be able to understand that this is a learning opportunity and this is a time for me to make mistakes now so I don't make them later and then be able to get that constructive feedback and criticism has been better for me. Especially hearing 'ok you did this right here's what, or here's what you could do better'. So …it's progressively gotten better for me. I don't get as anxious.

Emily, who does not enjoy being watched or recorded in simulation events had this to say about her progression to understanding:

> It's definitely gotten better as I go on. I'm still not a fan of being filmed but I like, I understand why we're being filmed. I'm not annoyed that we are, it just scared me a little bit (laughs). But I mean, I would film it too. I mean I get why we do that. I just try not to think about it (laughs).

Several students contrasted their junior year simulations with their most recent (senior year), generally casting those early simulation events as feeling less safe than later ones. They seemed to gradually accept that they would not know specifics of simulation scenarios before they were in them, trusted their instructors and classmates to be constructively critical rather than attacking, and the actuality of being recorded and watched eventually was something they could ignore. In this case, the progression toward a level of comfort is related to repetition, experience, and relationship-building over a period of time (two academic years) within the simulation environment. Analysis showed that *it got better* was a common theme among the students when discussing how their perspectives of their experiences had changed over time. There was a "progression of becoming more comfortable" (Burress, 2013). This concept of increased comfort over time appears in many studies in the fields of education and adult learning and is often related, as this study's outcome is, to personal experience, relationship-building, and realizations of expectations within a course, job role, or other situation.

Summary

The students I interviewed for this study gave detailed descriptions on safe learning environments and their experiences in simulation events. They were able to tie those two together and give insight into what makes them feel safe and what does not. From the data analysis, it became obvious that to feel safe in simulation, students must feel that it is "ok to make mistakes." Being able to make mistakes, without patient safety outcomes, without academic failure outcomes, without personal failing outcomes, led to a comfort level in simulation where students could feel physically, psychologically, emotionally, and academically safe. However, this comfort level was a progression over time and was not present for most participants in their initial simulation experiences. As familiarity with the process grew through repetition, participants reported greater feelings of safety or acknowledged their understanding of why their discomfort was important for the process.

The last question I asked each student, which was not part of the official interview protocol but is often considered part of good qualitative interviewing, was: Is there anything else you would like to say about your experiences in simulation at the college? Almost to a person, the students expressed a desire for more simulation time, more opportunities to work in the high-fidelity simulation lab space. They expressed gratitude for the equipment and expertise already available, stating they know not every program has this available to students. In fact, a high-fidelity simulation space has only been available to students in this program for two academic years. David, the fifth year senior of the interview group, talked at length after his interview about how different his last

two years in the nursing program were from the first, and how he tells his classmates they have no idea how good they have it now. And John summed up what most of his classmates expressed: “I think that it’s been incredible and I really wish they did more of it.”

Chapter 5

Discussion, Implications, and Future Research

In previous chapters I introduced my study and described the research method chosen for this study. I provided the findings as a thematic analysis derived inductively from the data and supported by the participants' own words. This chapter will begin with a summary of the study. I will then provide a discussion of the findings from chapter four. Implications for practice will then be presented and I will conclude with recommendations for future research.

Summary of Study

The purpose of this study is to better understand, from a student's perspective, how undergraduate nursing students describe a safe learning environment in clinical simulations from their experiences in these events. Since very little research has been conducted from the student perspective, this study gives voice to the students in simulation and helps inform educators in simulation design concerning safe learning environments. The study addresses the following research question: How do undergraduate nursing students describe their experiences of safety during clinical nursing simulations?

In order to determine how students describe safety in their simulation learning environments, thirteen undergraduate nursing students in a traditional Bachelor of Nursing program at a land-grant university in the southeastern United States were asked open-ended questions about their experiences in simulation. Their answers were recorded, analyzed and compiled into the findings described in chapter four. From these

students' narratives, the over-arching theme of *ok to make mistakes* built upon the themes: *nerve-wracking and blindsided* (which contained *uncertain expectations, prepared/unprepared*, *orientation/lack of orientation*), *instructor interventions/instructor discord*, *being watched/comfortable with each other*, *do no harm*, and *it got better*.

Discussion of Findings

The thematic findings in the previous chapter correspond to the three components of learning environments set out by Hiemstra (1991b). In introducing his book to the reader, Hiemstra expresses his evolving definition of the learning environment in this way: "A learning environment is all of the physical surroundings, psychological or emotional conditions, and social or cultural influences affecting the growth and development of an adult engaged in an educational enterprise" (p. 8). Merriam and Brockett (2007) built on this definition, further defining each of the three aspects of learning environment:

> Physical environment refers to the actual space in which learning takes place. Psychological environment centers on creating a climate in which both learners and teachers are able to engage in genuine exchange. Social environment centers on the culture of the teaching-learning setting… it emphasizes the place of social context in the adult learning environment (p. 149-150).

Since each of these aspects of the learning environment often contribute to the overall feeling of comfort (or discomfort) of the student in the classroom, it is notable that the analysis of the participant interviews in this study contained all three of these parts of the learning environment. The themes of this study fit in the following way:

Physical:

1. *do no harm*
2. *nerve-wracking and blindsided*
    a. *orientation/lack of orientation*

Psychological:

1. *nerve-wracking and blindsided*
    a. *uncertain expectations*
    b. *prepared/unprepared*
    c. *orientation/lack of orientation*
2. *it got better*

Social:

1. *instructor interventions/instructor discord*
2. *being watched/comfortable with each other*

In this study, the physical learning space was described by the themes *do no harm* and the sub-theme of *nerve-wracking and blindsided* called *orientation/lack of orientation*. The participants described the physical environment is physically safe to the participant (no exposure to hazardous diseases or chemicals) in *do no harm* and expressed a feeling of physical comfort in the simulation space due to prior knowledge of the laboratory setting and equipment in *orientation/lack of orientation*. The psychological learning space was described within the themes of *nerve-wracking and blindsided* and *it got better*. These themes contain the participants' descriptions of anxiety or concern over what to expect in the simulation events, how to prepare, and how these anxieties and concerns got better

over time. Lastly, the social learning space contained the themes *instructor intervention/instructor discord* and *being watched/comfortable with each other*. These two themes encompass the participants' thoughts on group dynamics within the simulation environment and how instructor behavior contributed to the learning environment. The data analysis revealed an emphasis by the students on the psychological and social aspects of the learning environment as it relates to the students' feelings of safety.

These three environmental components make up the over-arching safety of the learning space – safety the study participants referred to as *ok to make mistakes*. The findings suggest that it is *ok to make mistakes* in simulation learning environment. As Merriam and Brockett (2007) note: "the environment in which learning takes place plays an important role in successful learning" (p. 149). However, designing a safe learning environment is not a one-size-fits-all process for all situations. From a constructivist point of view, Jonassen (1999) argues that learning environments should have flexible outcomes from ill-defined problems which are drawn from the real life experiences of experts in a field. This fits with the design of simulation events, which are designed in conjunction with subject matter experts – in this case licensed practicing nurses who are also nursing instructors. These instructors bring current, real-world experience into the classroom and into simulation design.

Jonassen's Constructivist Learning Environments (CLEs) model also explains that the learning environment should be able to be manipulated by the learner and that the learning should be supported by instructor or facilitator scaffolding. Although Jonassen's

focus was on computer-based learning and virtual learning environments, manipulation by learners is accomplished in simulation events as well. Students have all the tools they need to successfully accomplish the goal(s) of the simulation, but how, if, or when they use these tools to manipulate the environment can lead to different outcomes. Additionally, prior to and after simulation events, instructors and facilitators will emphasize the learning goals of the scenario by providing students with information, examples and real world experiences related to the scenario and learning objectives. In this way, they support, or scaffold, the students' learning (Sawyer, 2005).

Other scholars in the field of adult learning focus on the physical layout of the learning space (Fulton, 1991; Vosko, 1991). Sometimes this focus is on the physical comfort of the learners, but the room or seating layout may also be used to equalize positions of power among participants. With this physical manipulation of the learning space, the psychological safety of the learner may be affected. Merriam and Brockett (2007) emphasize how learners' backgrounds and their historical social or cultural positions in society is to be considered in the learning environment. A group of learners can be alike in life experiences and backgrounds, but they may also be very diverse in these circumstances as well. As evidenced by the words of participants in my study, learners need trust and respect in a psychologically safe learning environment, which can be built into learning situations by instructors and classmates. Learners must feel safe enough to share openly (as in a group discussion) or dare to act (as in a nursing simulation scenario), depending on their learning situation.

As the findings indicate, the students spoke most often and at length about the psychological safety, or lack thereof, in the simulation learning environment. Within the realm of psychological safety also lies academic and emotional safety. From the students' experiences and the simulation literature, it is clear that simulation is not necessarily designed to be a psychologically safe environment for the students. Instructors may deem simulation as academically safe since no grades are given and students' failure in the program is not based on getting the scenario right. However some students reported that the pass/fail nature of simulation actually caused them distress.

As evidenced by the expanding volume of research and literature on simulation in nursing education, much time, planning and thought goes into the design of simulation scenarios. Simulation professionals create and share best practices, conduct outcome-based research and consult with one another to build simulation events that will enhance student learning. A surprising finding of this study was the feeling of anxiety, fear and nervousness in the simulation learning environment expressed by most participants. However, most of those strongly negative words were also tempered with the feelings that led to the theme *it got better* and the main theme of *ok to make mistakes*. As a researcher, that dichotomy indicates to me that students may be learning because of and in spite of the stress they're under in the learning environment. One student comparted her simulation experience to a final exam, which is also found in adult learning and nursing education literature. Wlodkowski (1999), states "[t]est anxiety is a widespread problem among adults" (p. 243). Beischel (2013) agrees, noting "the literature supports

that TA (test anxiety) has a powerful affect on learning outcomes" (p. 228). She then compares simulation to testing situations, saying:

> During a simulation, the student's performance is inevitably critiqued, independent of a subsequent grade. When a student performs in front of others, erroneous answers and faulty execution of nursing interventions are apparent to all. This is particularly true when video playback is a component of the debriefing period (p. 228).

Because of this anxiety, "it is anticipated that heightened anxiety negatively affect learning outcomes when a student participates in an HFS (high-fidelity simulation) learning experience" (p. 229). But from a nursing education perspective, it seems this jarring of the emotions, this lack of information or preparation, this inflicted stress, is part of the learning process specific to becoming a nurse. Rudolph (2014) elaborates on this viewpoint when discussing simulation environments noting: "psychological safety may not mitigate feelings of interpersonal risk. Rather it tends to create a setting where learners feel safe enough to embrace being uncomfortable" (pp. 339-340). Turner and Braine (2015), agree that in the case of children and the learning space, a 'safe' classroom should allow for creative risks (p. 48) and growth. They note that it is ideal to create "a space where pupils feel they can take risks … so that their learning can grow" (p. 52).

Implications for Practice

Knowles (1973) summarizes Maslow (Silberman, Allender, & Yanoff, 1972) when he describes the learner as "not crippled by fear" and says a learner "feels safe

enough to dare" (p. 40). However, what leads to comfort in a learning environment may depend heavily on the particular environment where the learning is occurring. The students in this study had very specific ideas about what safety in learning environments meant to them. In the next sections I will discuss how adult learning theory, CLEs and nursing simulation design can converge to build a better learning environment for undergraduate nursing students.

One of the most interesting discoveries made during my research into learning environments, student safety, and adult learning, was Jonassen's Constructivist Learning Environments (CLEs). My journey to CLEs was precipitated by my database searches for "constructivism" and "learning environments" while conducting my literature review. The CLE model includes best practices for building a successful learning environment including the elements of: student-centered learning, ill-defined problems based on real world experiences, student choice and manipulation of the learning environment, and scaffolding of learning by instructors or facilitators. Jonassen bases his model on the writings of Vygotsky which promote theories surrounding juvenile cognitive development (Vygotskii & Cole, 1978). Specifically, Jonassen adapted one of Vygotsky's concepts, the zone of proximal development, into his CLEs model for adult learning. The zone of proximal development is the theoretical space between what is known by an individual and what can be known by an individual with the help of others. Into this space Vygotsky places an adult expert or a more accomplished peer. In contrast, Jonassen places tools that an adult learner can manipulate into the learning environment in order to discover and construct new knowledge. Both scholars also agree that

scaffolding, the information from an expert that supports the learner's efforts, is important to the learning environment as well. The intriguing aspect of Jonassen's work in relation to nursing education is that he was designing learning environments where students learn through encountering ill-defined problems, designed by experts with life experience, and using tools to manipulate objects within that environment. This seems to parallel what is happening in simulation design. However, I found no links in the literature between Jonassen's CLEs and simulation or nursing. I believe further research into these possible links could inform simulation design in nursing from the point of view Jonassen's field of computer-based learning and the field of adult learning.

Another interesting concept that grew out of the findings was that safety does not necessarily equate to psychological or emotional comfort in simulation environments. Rudolph, et al. (2014) calls this "feel(ing) safe enough to embrace being uncomfortable" and refers to uncomfortable safety as practicing "at the edge of expertise, where knowledge and skills may or may not be sufficient to avoid mistakes" (p. 339). She argues that "the edge of expertise" is similar to the "zone of proximal development" which is discussed previously, and the scaffolding that occurs in those environments. She posits that previous studies suggest that:

> participants willing to experiment and who hold a learning orientation can (1) tolerate practicing at the edge of their ability, within an unfamiliar and possibly confusing environment; (2) appreciate comprehensive feedback in the context of demanding professional standards; (3) willingly reflect on problems and skills that are new or challenging to them; (4) correct and repeat actions; (5) contemplate

> and learn from mistakes; and (6) tolerate not knowing the exact answers to complex questions (p. 339).

This is supported by this study's data analysis, which showed even those things deemed nerve-wracking or traumatizing, did not negate learning or lead to a lack of safety. Safe does not always equal comfortable in simulation learning environments.

Limitations

Although I hope this study informs and inspires adult educators striving for safety in learning in multiple fields, there are several limitations to this study that must be acknowledged. First, the study participants were limited to undergraduate nursing students in two courses at one major land grant university in the Southeastern United States. Therefore, the findings from this study may not be applicable to students in other parts of the world, in different phases of their education, or to those learners who are not in a traditional higher education setting. Also, the student participants in this study spoke of their own lack of simulation experiences, citing only four simulation events in their senior year of study. This low number of events may have affected their perspectives of safety, especially those that develop over time and through familiarity. Although no formal definition was given by me to the student participants of "simulation", all but one student described full simulation scenarios to me, rather than other types of simulation they also encounter in their program (task trainers and role playing for example). One student mentioned a simulation event where the students took on the role of a mental health patient hearing voices and attempting to interact normally with others who could

not hear the voices (Leslie). This was the only simulation experience mentioned that was not conducted from the role of a nurse.

Other limitations of this study, which might affect findings and usefulness are the time constraints I was under and my interview skills at the beginning of the study. Since I am a full-time working adult, I have rarely been a full-time doctoral student as well. Due to circumstances beyond my control, my study, originally scheduled to be conducted in fall 2015, was actually conducted in spring of 2016. This led to a compressed timeframe for interviewing, transcribing, analyzing and writing. Although I have been involved in another qualitative study and took a qualitative methods course as part of my program, this is the first IRB-approved study where I took the role as lead (and only) interviewer. I feel that inexperience might have affected my ability to ask probing questions and delve deeper into the students' answers during the interviews. I feel I improved this skill over the course of the interviews and that the descriptions from the students were rich and met the needs of this study. However if I could do this study over again, I believe more depth and richness could be gleaned from the students with improved interviewing skills.

Recommendations for Future Research

More research from the students' point of view in nursing education

Within the field of nursing education research, there is a void of qualitative studies conducted with students involved in simulation as part of their nursing programs. Only in the last seven years or so have quantitative studies and surveys been conducted concerning student satisfaction specifically related to simulation (Fountain & Alfred, 2009; Kaakinen & Arwood, 2009; Levett-Jones et al., 2011). Qualitative studies in

nursing research tend to focus on the experiences of patients or nurses within clinical situations instead of focusing on students in educational settings (De Freitas et al., 2011; Herlin & Wann-Hansson, 2010; Laird, McCance, McCormack, & Gribben, 2015; Liu, Lei, Mingxia, & Haobin, 2010). However, in the *NLN/JSF Participant Construct* document released in 2011, the authors note: "Oftentimes, educators are so focused on the teaching and learning outcomes, they do not consider the nuances of the participant" (Durham et al., 2014). I argue there should be more qualitative studies conducted with nursing students to determine what is working in the learning environment, what may need updating, and what may be detrimental to students' learning. This additional research could impact the foundations of nursing education and enhance the learning experiences of our future nurses.

More research to enhance Adult Learning theory

One angle I explored early in my research design thought process was simulation events as transformative learning experiences. However, I eventually settled on simulation and student perspectives of a safe learning environment, feeling that focus was a better fit for the literature I knew and the study I could conduct. What the students said in their interviews concerning their learning renewed my interest in simulation events and the learning process within those events. From the first interview to the last, the students' descriptions of their experiences in simulation events called to mind the possibility of transformative learning within that environment. Research on transformative learning in simulation education could inform both the adult learning field and the nursing education field by focusing on what aspects of the experience lead to this process. Since students in

simulation are already "at the edge of expertise" and may be primed to "feel safe enough to embrace being uncomfortable" as noted previously, this may provide an opportunity to study the transformative learning process as experienced by these students. Simulation is also a controlled environment, which may reduce the variables within the environment and help determine what factors may lead to transformative learning.

More research from an adult learning theory perspective on how simulation events in nursing education are CLEs would be valuable as well. Merriam and Brockett (2007) note: "…relatively little has been written regarding the physical, psychological, and social dimensions of the learning environment" (p. 149) in the field of adult learning. The ties between these three fields – nursing education, adult learning, and computer-based learning – are obvious in high-fidelity simulation education, yet virtually unexplored. In my view, nursing education's ties to adult learning theory are fairly well-established as are computer-based learning's ties to adult learning. However, there is an opportunity to examine nursing education's high-fidelity simulation learning environments from the perspective of computer-based learning within the field of adult learning.

Additionally, the paradox of anxiety and comfort in simulation as a complex learning environment is intriguing. Findings showed that participants experienced contradictory emotions in their simulation experiences and nursing literature affirms this infliction of stress is intentional. As previously stated, in simulation events, safety does not equate to psychological or emotional comfort for the participants. More research could specifically address this conflict to better determine whether these feelings of

anxiety and stress enhance or obstruct the students' learning in simulation. This could also build on the concept of safe containers for learning in simulation put forth by Rudolph, et al. (2014) and discussed earlier in this paper.

Conclusion

The descriptions given by the thirteen participants in this study were remarkable in their maturity and depth of thought. The learning environment was something they had thought about before they were asked about their experiences - evidence that this is an important topic to them. Perhaps this is why they were willing and able to express their ideas so effectively during the interviews. Although each student brought something new to the interview table, similarities in their language and focus when speaking about the learning environment were evident from early in the interview process. This shared experience of the simulation learning environment is unique to these students and I am truly grateful they let me catch a glimpse of their experiences.

Safety in the learning environment is lauded as a goal by educators across fields. What I hope is accomplished by this study is insight into what safety means to student nurses in simulation learning environments. Their words are powerful and bring focus to the concept of safety, which can look different to learners at different times, in different fields and in different spaces. I hope this study is useful to nursing educators while also contributing to adult learning literature. By looking at simulation learning environments from an adult learning lens, and incorporating the ideas included within Constructivist Learning Environments, this study draws new parallels between these fields, so that each can inform the other.

References

About QSEN. (2016). Retrieved from http://www.aacn.nche.edu/qsen/about-qsen

Bearnson, C. S., & Wiker, K. M. (2005). Human patient simulators: a new face in baccalaureate nursing education at Brigham Young University. *Journal of Nursing Education, 44*(9), 421-425.

Beischel, K. P. (2013). Variables Affecting Learning in a Simulation Experience: A Mixed Methods Study. *Western Journal of Nursing Research, 35*(2), 226-247. doi:10.1177/0193945911408444

Berragan, L. (2011). Simulation: an effective pedagogical approach for nursing? *Nurse Educ Today, 31*(7), 660-663. doi:10.1016/j.nedt.2011.01.019

Bland, A. J., Topping, A., & Wood, B. (2011). A concept analysis of simulation as a learning strategy in the education of undergraduate nursing students. *Nurse Educ Today, 31*(7), 664-670. doi:http://dx.doi.org/10.1016/j.nedt.2010.10.013

Bowling, A. M. (2015). The Effect of Simulation on Skill Performance: A Need for Change in Pediatric Nursing Education. *Journal of Pediatric Nursing, 30*(3), 439-446. doi:http://dx.doi.org/10.1016/j.pedn.2014.12.010

Bradley, P. (2006). The history of simulation in medical education and possible future directions. *Medical Education, 40*(3), 254-262. doi:10.1111/j.1365-2929.2006.02394.x

Brookfield, S. D. (1995). *Becoming a Critically Reflective Teacher* (1st Edition ed.). San Francisco, CA: Jossey-Bass.

Brookfield, S. D. (2014). Foundations of Critical Theory. *Advances in Developing Human Resources, 16*(4), 417-428. doi:10.1177/1523422314543819

Burress, M. D. (2013). *A Story of Change: Adult Learners' Experiences of Questioning their Beliefs and Assumptions in a Graduate Course in Reflective Practice.* (PhD dissertation), University of Tennessee. Retrieved from http://trace.tennessee.edu/utk_graddiss/1702

Cook, D. A., Hatala, R., Brydges, R., & et al. (2011). Technology-enhanced simulation for health professions education: A systematic review and meta-analysis. *JAMA, 306*(9), 978-988. doi:10.1001/jama.2011.1234

Creswell, J. W. (2014). *Research Design: Qualitative, Quantiative, and Mixed Methods Approaches*. Thousand Oaks, CA: Sage Publications, Inc.

Damewood, A. M. (2016). Current Trends in Higher Education Technology: Simulation. *TechTrends*, 1-4. doi:10.1007/s11528-016-0048-1

De Freitas, G. F., Hoga, L. A., Fernandes Mde, F., Gonzalez, J. S., Ruiz, M. C., & Bonini, B. B. (2011). Brazilian registered nurses' perceptions and attitudes towards adverse events in nursing care: a phenomenological study. *J Nurs Manag, 19*(3), 331-338. doi:10.1111/j.1365-2834.2011.01208.x

Denzin, N. K., & Lincoln, Y. S. (2011). *The SAGE Handbook of Qualitative Research* (4th ed.). Thousand Oaks, CA: Sage Publications, Inc.

Diebel, A. E. (2008). *The Sage Encyclopedia of Qualitative Research Methods. The Sage Encyclopedia of Qualitative Research Methods. SAGE Publications, Inc.* Thousand Oaks, CA: SAGE Publications, Inc.

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. doi:http://dx.doi.org/10.1016/j.ecns.2014.04.002

Ewertsson, M., Allvin, R., Holmström, I. K., & Blomberg, K. (2015). Walking the bridge: Nursing students' learning in clinical skill laboratories. *Nurse Education in Practice, 15*(4), 277-283. doi:http://dx.doi.org/10.1016/j.nepr.2015.03.006

Fanning, R. M., & Gaba, D. M. (2007). The Role of Debriefing in Simulation-Based Learning. *Simulation in Healthcare, 2*(2), 115-125 110.1097/SIH.1090b1013e3180315539.

Fountain, R. A., & Alfred, D. (2009). Student satisfaction with high-fidelity simulation: does it correlate with learning styles? *Nursing Education Perspectives, 30*(2), 96-98 93p.

Fulton, R. D. (1991). A Conceptual Model for Understanding the Physical Attributes of Learning Environments. In R. Hiemstra (Ed.), *Creating Environments for Effective Adult Learning* (Vol. 50, pp. 13-22). San Francisco, CA: Jossey-Bass Inc.

Ganley, B. J., & Linnard-Palmer, L. (2012). Academic Safety during Nursing Simulation: Perceptions of Nursing Students and Faculty. *Clinical Simulation in Nursing, 8*(2), e49-e57. doi:http://dx.doi.org/10.1016/j.ecns.2010.06.004

Governors, N. L. f. N. B. o. (2015). A Vision for Teaching with Simulation. *NLN Vision Series.*

Harder, B. N. (2010). Use of simulation in teaching and learning in health sciences: a systematic review. *J Nurs Educ*, *49*(1), 23-28. doi:10.3928/01484834-20090828-08

Hayden, J., Jeffries, P., & Kardong-Edgren, S. (2012). The NCSBN national simulation study. *Clinical Simulation in Nursing, 8*(8), e407.

Heimlich, J. E. (1996). Constructing Group Learning. *New Directions for Adult and Continuing Education*(71), 41-49.

Herlin, C., & Wann-Hansson, C. (2010). The experience of being 30-45 years of age and depending on haemodialysis treatment: a phenomenological study. *Scandinavian Journal of Caring Sciences*, *24*(4), 693-699 697p. doi:10.1111/j.1471-6712.2009.00764.x

Hiemstra, R. (1991a). Aspects of effective learning environments. In R. Hiemstra (Ed.), *Creating Evironments for Effective Adult Learning* (Vol. 1991, pp. 5-12). San Francisco, CA: Jossey-Bass, Inc.

Hiemstra, R. (Ed.) (1991b). *Creating Environments for Effective Adult Learning* (Vol. 50). San Francisco, CA: Jossey-Bass, Inc.

Hope, A., Garside, J., & Prescott, S. (2011). Rethinking theory and practice: Pre-registration student nurses experiences of simulation teaching and learning in the acquisition of clinical skills in preparation for practice. *Nurse Educ Today, 31*(7), 711-715. doi:http://dx.doi.org/10.1016/j.nedt.2010.12.011

INACSL. (2015). History - International Nursing Association for Clinical Simulation & Learning. Retrieved from http://www.inacsl.org/i4a/pages/index.cfm?pageid=3279

Issenberg, S. B., McGaghie, W. C., Petrusa, E. R., Gordon, D. L., & Scalese, R. J. (2005). Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Medical Teacher, 27*(1), 10-28. doi:10.1080/01421590500046924

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., & Rogers, K. (2007). Simulations in nursing education: From conceptualization to evaluation. In P. R. Jeffries (Ed.), *Theoretical framework for simulation design* (pp. 21-58). New York: The National League for Nursing.

Jonassen, D. (1991). Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5-14. doi:10.1007/BF02296434

Jonassen, D. (1999). Designing Constructivist Learning Environments. In C. M. Reigeluth (Ed.), *Instructional-design Theories and Models: A New Paradigm of Instructional Theory, Volume II* (Vol. 2). Mahwah, NJ: Lawrence Erlbaum Associates.

Jonassen, D., & Rohrer-Murphy, L. (1999). Activity theory as a framework for designing constructivist learning environments. *Educational Technology Research and Development, 47*(1), 61-79. doi:10.1007/BF02299477

Kaakinen, J., & Arwood, E. (2009). Systematic review of nursing simulation literature for use of learning theory. *International Journal of Nursing Education Scholarship, 6*(1), 1p. doi:10.2202/1548-923X.1688

Keskitalo, T. t. k. u. f. (2012). Students' expectations of the learning process in virtual reality and simulation-based learning environments. *Australasian Journal of Educational Technology, 28*(5), 841-856.

Knowles, M. (1968). Andragogy, not pedagogy. *Adult leadership, 16*(10), 350-352.

Knowles, M. (1973). The adult learner: a neglected species.

Knowles, M., Holton, E. F., & Swanson, R. A. (2005). The adult learner : the definitive classic in adult education and human resource development (6th ed.. ed.). Amsterdam ; Boston: Amsterdam ; Boston : Elsevier.

Krefting, L. (1991). Rigor in Qualitative Research: The Assessment of Trustworthiness. *American Journal of Occupational Therapy, 45*(3), 214-222. doi:10.5014/ajot.45.3.214

Laird, E. A., McCance, T., McCormack, B., & Gribben, B. (2015). Patients' experiences of in-hospital care when nursing staff were engaged in a practice development programme to promote person-centredness: A narrative analysis study. *International Journal of Nursing Studies, 52*(9), 1454-1462. doi:http://dx.doi.org/10.1016/j.ijnurstu.2015.05.002

Levett-Jones, T., McCoy, M., Lapkin, S., Noble, D., Hoffman, K., Dempsey, J., . . . Roche, J. (2011). The development and psychometric testing of the Satisfaction with Simulation Experience Scale. *Nurse Educ Today, 31*(7), 705-710. doi:http://dx.doi.org/10.1016/j.nedt.2011.01.004

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 75): Sage.

Liu, M., Lei, Y., Mingxia, Z., & Haobin, Y. (2010). Lived experiences of clinical preceptors: A phenomenological study. *Nurse Educ Today, 30*(8), 804-808. doi:http://dx.doi.org/10.1016/j.nedt.2010.03.004

Maslow, A. H., Frager, R., Fadiman, J., McReynolds, C., & Cox, R. (1970). *Motivation and personality* (Vol. 2): Harper & Row New York.

McGaghie, W. C., Issenberg, S. B., Petrusa, E. R., & Scalese, R. J. (2010). A critical review of simulation-based medical education research: 2003–2009. *Medical Education, 44*(1), 50-63. doi:10.1111/j.1365-2923.2009.03547.x

Merriam, S. B. (2009). *Qualitative Research: A Guide to Design and Implementation* (2nd Edition ed.): Jossey-Bass.

Merriam, S. B., & Bierema, L. L. (2014). *Adult learning : linking theory and practice*.

Merriam, S. B., & Brockett, R. G. (2007). *The Profession and Practice of Adult Education: An Introduction*. San Francisco, CA: Jossey-Bass.

Michels, M. E. J., Evans, D. E., & Blok, G. A. (2012). What is a clinical skill? Searching for order in chaos through a modified Delphi process. *Medical Teacher, 34*(8), e573-e581. doi:10.3109/0142159X.2012.669218

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. doi:http://dx.doi.org/10.1016/j.ecns.2014.06.004

Patton, M. Q., & Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, Calif.: Sage Publications.

Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative Research in Health Care: Analysing Qualitative Data. *BMJ: British Medical Journal, 320*(7227), 114-116.

QSEN. (2015). Project Overview. Retrieved from http://qsen.org/about-qsen/project-overview/

Roman, M. (2014). *The RIDE: Graduate Students Team Up for Recovery-based, Interprofessional Distance Education*. Paper presented at the American Psychiatric Nurses Association, Indianapolis, IN.

Rosseter, R. (2014, April 24, 2014). Nursing Shortage Fact Sheet. Retrieved from http://www.aacn.nche.edu/media-relations/fact-sheets/nursing-shortage

Rowbotham, M. A. (2010). Teacher perspectives and the psychosocial climate of the classroom in a traditional BSN program. *International Journal of Nursing Education Scholarship, 7*(1), 14p-14p 11p. doi:10.2202/1548-923X.1808

Rubin, H. J., & Rubin, I. (2012). *Qualitative interviewing : the art of hearing data*. Thousand Oaks, Calif.: SAGE.

Rudolph, J. W., Raemer, D. B., & Simon, R. (2014). Establishing a Safe Container for Learning in Simulation: The Role of the Presimulation Briefing. *Simulation in Healthcare, 9*(6), 339-349. doi:10.1097/sih.0000000000000047

Rutherford-Hemming, T. (2012). Simulation Methodology in Nursing Education and Adult Learning Theory. *Adult Learning, 23*(3), 129-137. doi:10.1177/1045159512452848

Sahu, S., & Lata, I. (2010). Simulation in resuscitation teaching and training, an evidence based practice review. *Journal of Emergencies, Trauma and Shock, 3*(4), 378-384. doi:10.4103/0974-2700.70758

Salas, E., Bowers, C. A., & Rhodenizer, L. (1998). It Is Not How Much You Have but How You Use It: Toward a Rational Use of Simulation to Support Aviation Training. *International Journal of Aviation Psychology, 8*(3), 197.

Sawyer, R. K. (2005). *The Cambridge Handbook of the Learning Sciences*. Cambridge, GB: Cambridge University Press.

Sherwood, G. D., & Horton-Deutsch, S. (2012). *Reflective Practice: Transforming Education and Improving Outcomes* (12th ed.): Sigma Theta Tau.

Shin, S., Park, J.-H., & Kim, J.-H. (2015). Effectiveness of patient simulation in nursing education: Meta-analysis. *Nurse Educ Today, 35*(1), 176-182. doi:http://dx.doi.org/10.1016/j.nedt.2014.09.009

Shinnick, M. A., & Woo, M. A. (2013). The effect of human patient simulation on critical thinking and its predictors in prelicensure nursing students. *Nurse Educ Today, 33*(9), 1062-1067. doi:http://dx.doi.org/10.1016/j.nedt.2012.04.004

Silberman, M. L., Allender, J. S., & Yanoff, J. M. (1972). *The psychology of open teaching and learning; an inquiry approach*. Boston: Little, Brown.

Simulation. (2015). Retrieved from http://www.merriam-webster.com/dictionary/simulation

SSH. (2015). About SSH. Retrieved from http://www.ssih.org/About-SSH

Sullivan-Mann, J., Perron, C. A., & Fellner, A. N. (2009). The Effects of Simulation on Nursing Students' Critical Thinking Scores: A Quantitative Study. *Newborn and Infant Nursing Reviews, 9*(2), 111-116. doi:http://dx.doi.org/10.1053/j.nainr.2009.03.006

Sundler, A. J., Pettersson, A., & Berglund, M. Undergraduate nursing students' experiences when examining nursing skills in clinical simulation laboratories with high-fidelity patient simulators: A phenomenological research study. *Nurse Educ Today*. doi:http://dx.doi.org/10.1016/j.nedt.2015.04.008

Tanner, C. A. (2006). Thinking like a nurse: a research-based model of clinical judgment in nursing. *Journal of Nursing Education, 45*(6), 204-211 208p.

Taylor, E. W., & Cranton, P. (2012). *Handbook of Transformative Learning: Theory, Research, and Practice*

Turner, S., & Braine, M. (2015). Unravelling the 'Safe' concept in teaching: what can we learn from teachers' understanding? *Pastoral Care in Education, 33*(1), 47-62. doi:10.1080/02643944.2015.1005657

Vosko, R. S. (1991). Where We Learn Shapes Our Learning. In R. Hiemstra (Ed.), *Creating Environments for Effective Adult Learning* (Vol. 50, pp. 23-32). San Francisco, CA: Jossey-Bass Inc.

Vygotskii, L. S., & Cole, M. (1978). *Mind in society : the development of higher psychological processes*. Cambridge: Harvard University Press.

Wlodkowski, R. J. (1999). *Enhancing Adult Motivation to Learn*. San Francisco, CA: Jossey-Bass, Inc.

Appendices

Appendix A Interview Protocol

Interview Protocol

Pseudonym: _____

Introduction: Thank you for participating in this study. During this interview, you will have the opportunity to share with me your personal experiences of simulation as a nursing student. I want to remind you that your identity will remain confidential. So, I want you to feel free to speak openly about your experience. Will it be okay for me to record the interview?

Before we begin, I want to tell you a little about myself (name, title, reason for research, research interest) and give you the opportunity to ask me any questions pertaining this study or information you would like to learn about me.

Interview: Experience of College

Time of Start Interview:
Time of End Interview:
Date:
Location:
Interviewer:
Interviewee:

Interview Questions:

1. Describe for me in your own words what your simulation experiences are like for you as a student. Assume I know nothing about nursing or simulation.
2. Can you tell me what a safe learning environment means to you as a nursing student?
3. After thinking about what a safe learning environment means to you, please tell me how simulation was or was not a safe learning environment for you.
4. What suggestions do you have, if any, to make simulation a safer learning environment for nursing students?

Potential Follow-up Questions or Prompts:

- Please say more about _____
- You said earlier, _____, can you tell me more about that?
- Student safety in a learning environment is also sometimes referred to as academic safety or psychological safety, can you tell me what you think about that definition in the context of simulation?

Appendix B Informed Consent

Informed Consent Statement
What They Say: Student Voices in Nursing Simulation

INTRODUCTION
You are invited to participate in a research study conducted by Andrea M. Damewood, a Doctor of Philosophy candidate from the University of Tennessee, Knoxville. The results from this study will contribute towards a doctoral dissertation.

You were selected as a possible participant in this study because you identify as a senior-level undergraduate student currently enrolled in Nursing 403 and/or Nursing 404 at the University of Tennessee. You must be aged 18 or older to participate. Your participation is voluntary. Please take as much time as you need to read the information sheet. You may also decide to discuss it with your family or friends. You will be given a copy of this form.

INFORMATION ABOUT PARTICIPANTS' INVOLVEMENT IN THE STUDY
You will be asked to participate in one face to face interview (approximately 30-60 minutes) during the Spring 2016 semester. You may also be asked to clarify or verify your meaning after the interview is complete by reviewing the transcript of your interview. In the interview, you will be asked a series of questions related to your past experiences with simulation as a nursing student. All interviews will be digitally recorded and notes will be taken. All interviews will be transcribed. You will be given a false name (pseudonym).

RISKS
You may experience some discomfort during the interview while you are discussing your past experiences with simulation as a nursing student. You may skip any questions that may make you uncomfortable. You may discontinue your participation in this study at any time. If any discomfort or uncertainty occurs, you can stop the interview.

There is also the risk of potential loss of confidentiality during the study. To minimize this risk, you will be given a false name (pseudonym) and all forms and data will be stored securely by the Primary Investigator (PI).

BENEFITS
There are no anticipated benefits to participants resulting from participation in this study. Your participation in this study has the potential to provide the benefit of new information to educators developing simulations for future nursing students.

PAYMENT
You will receive a $10 gift card to a local coffee shop for your participation.

CONFIDENTIALITY

The information collected about you will be coded using a fake name (pseudonym). Data will be stored securely and will be made available only to the researcher. When the results of the dissertation are discussed, no information will be included that would reveal your identity. Your name will not be published or shared with anyone outside of the research, including the faculty, staff, or administrators at the University.

CONTACT INFORMATION

If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Andrea M. Damewood at andi@utk.edu and (865) 974-2379 or her advisor, Dr. Mary Ziegler at mziegler@utk.edu and (865) 974-0453. If you have questions about your rights as a participant, you may contact the University of Tennessee IRB Compliance Officer at utkirb@utk.edu or (865) 974-7697.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will not be used in this study and will be securely destroyed.

CONSENT

I have read the above information. I have received a copy of this form. I agree to participate in this study.

Participant's Name (printed) _____

Participant's Signature _____ Date _____

Vita

Andrea Damewood was born in Knoxville, TN to Dennis and Brenda McMahan. She is the third of four daughters which included, Angela, Amy, and Anna. She attended Halls Elementary School, Halls Middle School, and Halls High School in Knoxville, TN. After graduating high school, she attended Furman University in Greenville, SC where she majored in Biology, graduating with a Bachelors of Science degree. She then attended the University of Tennessee, Knoxville to obtain her Masters of Science degree in Communications. After several years in the workforce as an Information Technology professional at the University of Tennessee, she began pursuing her Doctor of Philosophy degree in Educational Psychology with a concentration in Adult Learning. She graduated from the University of Tennessee, Knoxville in August 2016 with her doctorate.