Teaching with Simulation: The Experience of Physical Therapist Faculty

by

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Abstract

This study examined the experiences of physical therapist faculty who incorporate simulation education as part of their teaching practice. The researcher used an interpretive phenomenological analysis to explore each individual faculty member’s experience through multiple semi-structured interviews. The study answered the research question: How do physical therapist faculty members make sense of their experience with using simulation in their teaching practice? Transformative learning theory was the theoretical framework that guided this study. The data obtained through this interpretive phenomenological analysis allowed the researcher to understand the lived experiences of eight physical therapist faculty members who use simulation in their teaching practice. Eight participants with a range of 3 to 19 years of using simulations shared their individual experiences. Each participant had taken a unique path to becoming a simulation educator, and had varying levels of training and experience. Participants were understood to have developed their simulation practice through their experiences, which included a focus on interprofessional practice. An examination of themes across participants identified five super-ordinate themes. These major themes emphasized that physical therapist faculty teach with simulation using a standardized process that allows faculty to teach content that would not otherwise be taught effectively. The teaching practice is influenced by academic constraints and the participants’ lived experiences. The physical therapist faculty experience included interprofessional education, and simulation was a method relied upon for teaching interprofessional practice. Each of the eight participants experienced transformations that were influenced in part by their practice with simulation education. The study’s findings inform the educational process of simulation education. The uncovering of faculty experience provides evidence that warrants ongoing research and support to develop and expand the teaching practice.
of simulation education as part of physical therapist education.

*Keywords*: physical therapist education, simulation education, faculty development in simulation education, physical therapist curriculum, health care education
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The most important thing that I have learned is that there is more to learn

-- President William Jefferson Clinton

This dissertation is the product of not only the last three rigorous years of study, but of the previous 41 years of learning. This manuscript is in partial fulfillment of my fourth degree from Northeastern University and my second doctorate. Clearly, I am a lifelong learner. For this, I have many people to thank.

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Chapter I: Introduction

Statement of the Problem

Although physical therapist faculty members have adopted simulation education into their teaching practices, their experience with using this teaching method is not well known. The evolution of simulation education in physical therapist programs over the last several years is preceded by success within physician education (McIndoe, 2012; Scalese, Obeso, & Issenberg, 2008). Simulation education involves the creation of realistic clinical scenarios through which physical therapist students can actively participate in patient management using actors or computerized manikins (Shoemaker, Riemersma, & Perkins, 2009). The aim of this teaching practice is to use the student’s experience with a clinical dilemma or situation to transform his or her learning through conversation (A. C. Baker, Jensen, & Kolb, 1997). Simulation education concludes with debriefing sessions, in which students are guided by a faculty member to reflect on their frames, thoughts, and actions, resulting in new learning for future practice (Fanning & Gaba, 2007).

While faculty members have a significant responsibility in simulation education, little is known about what this responsibility and teaching experience is like in physical therapist education. A recent systematic review identified simulation education as beneficial to student learning and a successful teaching method in entry-level physical therapist programs (Mori, Carnahan, & Herold, 2015). While this review finds multiple benefits from simulation, it did not explore the physical therapist faculty role and experience in simulation education.

This examination of faculty members’ perceptions about teaching with simulation in physical therapist education provided a unique opportunity to understand faculty insight into their own teaching experiences and to interpret simulation education from the physical therapist
faculty member’s point of view. Knowledge gained from this examination can deepen the conversation about simulation education in physical therapist programs and may help future physical therapist faculty members adopt this method in their own teaching practices. The purpose of this study was to understand how individual physical therapist faculty members have perceived their experiences with simulation education as part of their teaching practice through interviewing individual physical therapist faculty members from across the United States.

**What is Simulation Education?**

Simulation education is a teaching methodology that allows students to perform psychomotor and clinical reasoning skills in a realistic and controlled environment (Jeffries, 2005). Following this performance, faculty guide students through reflection on their thoughts and actions to assist the student in attaining new learning (Fanning & Gaba, 2007).

To teach with simulation, health care educators design clinical cases for their students to perform. These cases require students to interact with either high fidelity manikins or patient actors known as standardized patients (Shoemaker, 2009). High fidelity manikins are controlled by a computer that breathe and talk as if they were patients, allowing adverse events to be simulated (Cooper & Taqueti, 2008). This process, which mimics flight aviation simulation, allows for repeated practice in a safe environment free from actual harm to patients (Lin, Travlos, Wadelin, & Vlasses, 2011). Standardized patients, known as low-fidelity simulation, are used when the educational objectives require human interaction such as human movement or musculoskeletal tests and measures (Paparella-Pitzel, Edmond, & DeCaro, 2009). Medical simulation centers have been constructed in
major medical centers, universities and the armed forces to educate students and clinicians (Deering et al., 2012; Haluck et al., 2007).

**Significance of the Problem**

This study provided knowledge about simulation education that will benefit physical therapist educators and students. Several research studies in other health care professions emphasize the need for examining the faculty experience with simulation. In physician education, the faculty is important in developing student learning with simulation (Wang, 2011). The United States Army medical simulation program notes that it is essential to include faculty training and development in their organization’s framework (Deering, Sawyer, Mikita, Maurer & Roth, 2012). Kordowicz and Gough (2014) report that faculty and training the trainer curricula are essential for success in their surgical simulation program. Lessons learned from other professions illustrate the need to examine the faculty experience in physical therapy.

Faculty simulation training programs exist so that health professions faculty can learn the process of simulation education. These programs commonly enroll physician and nurse educators, and also offer enrollment to people in other health professions, including physical therapist educators (Harvard MIT Center for Medical Simulation, 2016). While simulation educator programs provide comprehensive education about the simulation process, they are not focused on instruction specific to the profession of physical therapy, and do not understand a physical therapist faculty member’s individual experience with teaching through simulation.

Students, who rely on their program of study to prepare them for their careers, require curricula that teach them to be safe and effective practitioners (American Physical Therapy Association, 2004). Simulation has met this need. Students’ confidence, clinical skills, and engagement with the clinical environment have all been demonstrated to improve when faculty
enhance the impact of their instruction through simulation (Ohtake, Lazarus, Schillo, & Rosen, 2013; Shoemaker et al., 2011; N. Smith, Prybylo, & Conner-Kerr, 2012). Faculty report that students who are educated using simulation are more prepared and demonstrate better performance on evaluations during clinical rotations (Silberman, Panzarella, & Melzer, 2013). Nithman, Spiegel, and Lorello (2016) find that simulation participation led to increased student confidence in several clinical skills. Silberman, Litwin, Panzarella, and Fernandez-Fernandez (2016) use qualitative analysis to identify higher student safety and communication skills when instructed with simulation. The ability of faculty-led simulation to advance clinical application in an academic setting has led to educators positing that simulation may be able to replace clinical practicum hours (Mori et al., 2015).

Simulation is expensive and resource intensive, requiring small student-faculty ratios and expensive equipment (Curtis, Diazgranados, & Feldman, 2012; Galal, Carr-Lopez, Seal, Scott, & Lopez, 2012; Shoemaker et al., 2009). Significant financial impact and extensive faculty training are limitations to adding or enhancing simulation education within a physical therapist program. Despite simulation being incorporated into some physical therapist programs, simulation is not used in all programs, and is not required in physical therapist education. This exploration of faculty perceptions of their teaching provided a deeper understanding that helps justify the time, money, and resources needed to implement this teaching practice. This deeper understanding will provide perspective and knowledge that will further the process of simulation education.

**Positionality Statement**

An important step in the research process is identifying the author’s own positionality with respect to the proposed research. Each methodology has a unique perspective on the
Acknowledging bias as part of the study design process is essential to a rigorous study.

**Author’s background.** The researcher is a white middle-aged woman who grew up in a privileged suburb of Boston. She received all three of her educational degrees from Northeastern University, which is where she currently teaches and calls home. Northeastern University is a large urban university whose mission is “to educate students for a life of fulfillment and accomplishment and create and translate knowledge to meet the needs of the global and societal needs” (Northeastern University, 2015). The researcher is an associate clinical professor of physical therapy. She has earned a doctorate in physical therapy, and is a trained simulation instructor and an acute care expert in physical therapist practice. As a full time faculty member she has taught 15 courses in the physical therapy program, focusing on developing students’ clinical decision-making skills and their ability to practice upon graduation. The researcher’s specific physical therapist clinical expertise is in the treatment of older adults and the acute care hospital setting. In addition to teaching and pursuing her doctorate in education, she continues ongoing clinical practice in a community acute care hospital on a limited basis.

As a clinician with a clinical doctorate, the researcher has an established research agenda. She has presented both regionally and nationally and has several publications, including a core document for acute care physical therapist practice (Greenwood, Nicoloro, & Iversen, 2014; Greenwood et al., 2015). Her research focus is twofold: examining how to prepare physical therapist students for entry-level practice in acute care, and the use of simulation as an educational method.

**Author’s experience with simulation.** The researcher was formally trained as an instructor through the Harvard/MIT Center for Medical Simulation in 2012. Since then, she has
expanded the use of simulation in her own physical therapist education program and led her college’s initiative of interprofessional simulation education as co-chair of its interprofessional simulation council. She uses simulation in several of her courses and helps faculty throughout her department and college learn how to incorporate simulation into their own teaching practices.

**Addressing bias.** The researcher’s experience has influenced her thoughts and opinions on why simulation works, thereby creating bias that could predispose her to draw certain premature conclusions about this area of study (Carlton Parsons, 2008). However, the author’s background and experience with simulation also created a common experience between the researcher and participants, and assisted with relating and interpreting the research findings (Briscoe, 2005). Her positionality allows her to understand that each simulation experience is individual rather than a standardized collective process. The researcher accepts her positionality and its potential impact on the study. Cautious steps described later in this proposal were taken in accordance with appropriate research method standards to ensure that her positionality is beneficial instead of a hindrance to the study.

**Research Question**

How do physical therapist faculty members make sense of their experience with using simulation in their teaching practice?

**Theoretical Framework**

**Transformative Learning Theory.** The researcher used Mezirow’s (1991) theory of transformative learning as the framework for this study to understand the experiences of physical therapist faculty members who design simulations. Transformative learning theory is a theory of adult learning (Merriam, 2001), which explains that an adult’s learning in a meaningful context transforms the learner into a new reality by moving through 10 purposeful stages or concepts of
learning (Mezirow, 1991). Transformative learning theory is built on earlier work by key educational theorists such as Freire, Dewey, and Schön.

Transformative learning theory is used in simulation education to guide faculty in designing and implementing simulation education for their students (Clapper, 2010). Previous studies using transformative learning theory have identified a need for further research examining the faculty’s understanding of how simulation assists students with transformation (K.V. Smith, Witt, Klaassen, Zimmerman, & Cheng, 2012; Frederick, Cave, & Perencevich, 2010). The choice to use transformative learning theory guided the researcher’s decisions and framed the research expectations (Ravitch & Riggan, 2011). This framework allowed the researcher to observe the phenomenon being studied without omitting any aspect of it (Anfara & Mertz, 2006).

Mezirow presented transformative learning theory in 1978 through examining women who returned to work or school after an extended period away (Mezirow, 1991; Kitchenham, 2008). Transformative learning theory has evolved since its initial inception in 1978, however, the center of the theory has remained the basic premise that transformational learning is meaning making through examining one’s own reality (Kitchenham, 2008).

In following transformative learning theory, the learner achieves transformation through a ten step process of acquiring new learning, which creates a lasting change in the learner (Mezirow, 1991). Mezirow initially posited that in order for transformational learning to take place, the learner must experience all 10 stages or concepts of learning. In more recent years, research has focused on critical reflection and transformation as a philosophy of education (Taylor, 2008).
The 10 stages of transformative learning begin with the distorting dilemma, when a learner encounters an event, thought, or situation that challenges his or her reality, requiring him or her to make sense of the situation (Mezirow, 1991). This dilemma forces the learner to enter stage two, the examination of self for his or her own feelings, in order to become in touch with his or her own thoughts or frames. Stage three, critical reflection, then follows in which the learner examines his or her own positionality and bias with an explicit recognition of his or her own role and the role of others in this process. Mezirow holds that the reflection stage is essential to the learner’s transformation. Merriam (2004) questions the level of cognitive intelligence needed for such reflection. Merriam (2004) emphasizes that transformational learning, as originally described, requires adult cognitive development before it can take place. Absence of this adult cognitive development may limit learning transformation. Mezirow (2004), himself guided by Merriam, concedes that the amount and level of reflection needed for transformation to occur may be dependent on the context where learning takes place.

The remaining stages of transformative learning theory describe the process of learner transformation. In stage four, the learner recognizes his or her conflict with needing to change while acknowledging others have changed within similar circumstances. In stages five through eight, the learner explores, plans, and acquires new knowledge and implements new action. In stage nine, this new trialed action increases the learner’s competence and self-confidence. Finally stage ten is achieved. In this final stage, the transformative process is integrated into the learner, transforming him or her into a different person than before the dilemma occurred (Mezirow, 1991; Kitchenham, 2008).

Several other educational theorists have embraced, studied or challenged transformative learning theory. Kitchenham (2008) examines the evolution of Mezirow’s theory, concluding
that this theory is well researched and proven valid. Taylor’s (2007) empirical review concludes that transformative learning is a sound method for educational research and practice, but further analysis and development are needed. Taylor’s (2008) work on transformative learning theory focuses on enhancing and expanding transformational learning, and examining how other factors, including neurobiology and emotion, interplay with transformative learning.

Critiques of transformative learning. Kucukaydin and Cranton (2013) refer to transformative learning theory as a work in progress. Critics of the theory state critical elements are lacking, and consider it a concept instead of an educational theory. Critics of transformative learning theory admit that it has practical application for adult education, despite its subjectivity and lack of a true philosophical theoretical basis (Howie & Bagnall, 2013). Transformative learning theory is acknowledged to describe the leap students take to change their practice through increased consciousness and individual sense-making of their learning experiences (Arbusson, Harrison, & Ritchie, 2006, cited in Howie & Bagnall, 2013). For this reason, they acknowledge that the disagreement over whether this is a theory or merely a concept is not as important as the research and practice developments that come from it. The ongoing debate over how to improve this theory have provided further clarification, but has not substantially discredited it (Howie & Bagnall, 2013).

Justification of framework. Transformative learning theory has been used to understand the educator’s role in student learning. Mezirow (1997) shows that faculty can assist students with learning through transformation when creating learning opportunities for them. Taylor (2008) cautions educators that teaching for transformation is not easy, so they should not undertake the challenge without first reflecting on their own experiences. Merriam, Caffarella,
and Baumgartner (2012) claim it is possible to uncover transformative learning through
examining faculty instruction, but limited findings exist.

Transformative learning theory has been previously used to explore teaching practice. Rhodes (2013) uses it to examine the journey educators take in becoming scholar practitioners. A narrative study by Brigham (2011) identifies transformative learning theory as important in teacher professional practice and teacher education. Transformative learning has earned its place in higher education through providing educators with a method for faculty to challenge students with learning that transforms their practice (Christie, Carey, Robertson, & Grainger, 2015). Educators who utilize transformative learning seek to increase students’ independent thought (Christie et al., 2015). Each of these publications demonstrates that the theory can be used to understand educational practice.

**Alignment with study.** Simulation education focuses the student on learning through an intentionally discomforting situation, so he or she then progresses and transforms into a new state of clinical thinking (Kneebone, 2009). Simulation education utilizes transformative learning theory to explain the process of student learning from simulation. Clapper (2010) reports faculty need to understand the principles of transformative learning theory when designing simulation education experiences. In this study transformative learning theory was used as a lens to view the teaching process simulation educators are experiencing, providing a common ground between the researcher and participants and aligning the study.

Transformative learning theory has been used to study simulation education in other professions. In the nursing education, transformative learning is the goal of the simulation learning experience, and requires faculty who teach with it to understand the principles of the theory while designing such experiences for their students (Clapper, 2010). In healthcare,
Simulation education provides a unique transformative learning opportunity because educators can design learning experiences in a realistic setting for students’ clinical practice without risking harm to actual patients (Parker & Myrick, 2010).

Scholar practitioners who focus on furthering the practice of simulation education have used transformative learning theory as a framework in their research. K.V. Smith et al. (2012) used it to examine faculty and student perspectives on simulation as an educational process to transform the learning of legal and ethical concepts. Frederick, Cave, and Perencevich (2010) examine how teacher candidates are transformed on social justice issues through learning with simulation. Each of these studies argue that further research is needed into the faculty’s understanding of the design process, implementation, and student outcomes in order to assist students with transformation and reflection through simulation.

The decision to use transformative learning theory as a framework for this study informed the researcher’s question development and proposed methodology. The researcher aimed not to ask faculty what their students feel and learn, but what the faculty member experienced through adopting this teaching process. This study explored faculty experience with simulation to inform simulation teaching within the researcher’s own practice as well as physical therapist education practice in general. The findings of this study benefit all stakeholders in physical therapist education, including faculty, students, and the consumers of physical therapy services who students will encounter in their future practice.
Chapter II: Literature Review

This literature review analyzed scholarly work on simulation education in health professions, specifically in physical therapist education. Following the structure of an interpretive phenomenological analysis study, this literature review provided background knowledge and known strengths and weaknesses related to the research topic, but was limited in order to allow for the phenomenological process that stems from the research question. Therefore, this literature review was not theory driven; rather it identified information useful to the understanding of the participants studied and provided supporting research that warranted this study (J. A. Smith, Flowers & Larkin, 2009).

The following questions were answered with this evaluative literature review: What is simulation education and how has it evolved to be an educational method? What are the uses and outcomes associated with simulation education within physical therapy? What is known about the faculty role in simulation education? Findings from this literature review are presented below.

Simulation as an Educational Methodology

Simulation is a series of educational exercises in which students perform decision-making and task initiation in complex dynamic environments using patient actors or artificial patients to avoid harm to actual patients (Fanning & Gaba, 2008). Simulation is an overall term that includes both high-fidelity simulation, which uses computerized manikins as patients, and low-fidelity simulation, which uses human actors through a standardized process (Shoemaker et al., 2011). The concept of simulation education began in 1929, as a method for flight aviation. Pilots were trained using flight simulators instead of aircraft to avoid actual harm when mistakes occurred (Lin, Travlos, Wadelin, & Vlasses, 2011).
Within the medical field, simulation education began as a pedagogical practice for educating anesthesia residents (Abrahamson, Denson, & Wolf, 1969). In 1969, Abramson, et al. (1969) demonstrated that adding simulator training in anesthesia education at the University of California School of Medicine resulted in decreased training time and patient risk. Their study began an avenue of research and use of simulation education within the medical field.

Today, simulation is used in medical education and physician continuing education as an active learning methodology to meet an aspect of medical science education that cannot be taught with traditional lectures (Fanning & Gaba, 2008). Medical simulation centers educate students and clinicians at major medical centers, universities, and in the armed forces (Deering et al., 2012; Haluck et al., 2007). Successful use of simulation to teach medical students to save lives has led to its widespread adoption for a variety of clinical skills (Blackstock & Jull, 2007). Simulation education in medicine is now a standard practice in physician education (Curtis et al., 2012; Deering et al., 2012; Mathai et al., 2014; Scalese et al., 2008; Spanager et al., 2013).

Wang (2011) says that several key historical markers promoted simulation education as an acceptable practice. In 1999, The Institute of Medicine, the highest medical oversight organization for medical education and practice, justified simulation’s use by calling for improved education systems that decrease errors in patient safety (Wang, 2011). Five years later, the establishment of the Society for Simulation in Healthcare created an environment for simulation educators to align their practice and develop curricula from the standpoint of educators and clinicians (Wang, 2011). As of January 2016, the Society for Simulation in Healthcare has over 3,000 international members, and focuses on promoting simulation education and assessment (Society for Simulation in Healthcare, 2016).
Several key examples highlight the importance of healthcare simulation education within medicine. The United States armed forces is a known leader in medical simulation education, and its simulation program follows a strong and defendable mission “to be a worldwide leader in managing and directing multidisciplinary graduate medical education… and a vision, to ensure all army providers are safe” (Deering et al., 2012, pp. 829-830). Within the practice of residency training, students in the internal medicine program at Massachusetts General Hospital participate in eight case-based high-fidelity simulations within the first four-month period of the academic medical school (Mathai et al., 2014).

**Debriefing.** Debriefing is a sequential process that assists students in reflecting on their performance and identifying cognitive errors or misjudgment (Fanning & Gaba, 2007). Debriefing is documented to be an effective method of helping students improve their clinical judgment through facilitating higher level thinking (Mariani, Cantrell, & Meakim, 2014). For this reason, it is posited that simulation education can take place using any clinical scenario that evokes decision and action and requires a post debriefing exercise (Rudolph, Simon, Raemer, & Eppich, 2008).

Student debriefing is commonly led by faculty and may follow several different formats. Faculty are responsible for best practices in debriefing, which include intentional preparation and an established plan for accomplishing the stated objectives of the simulation (Lyons, Lazzara, & Benisheck, 2015). Faculty debriefers have multiple roles. Within a debriefing, the faculty inform, facilitate, assess, plan, and develop resources for a successful simulation (Harden & Crosby, 2000, cited in Dieckmen, Freis, Lippet, & Ostergaard, 2009, p. 288). A debriefing moves students through reflection on what occurred, their emotions and thoughts, and their differing viewpoints in order to help students apply this reflection to clinical practice (Fanning &
A student should do the majority of the talking during a debriefing, although Dieckman et al. (2009) find this varies based on the scenario, and faculty often do a significant amount of the talking in order to facilitate student discussion.

The advocacy inquiry framework is a common method of debriefing. This framework was created by the Harvard/MIT Center for Medical Simulation, which examined over 1,000 different clinicians participating in over 3,000 simulation and debriefing events to identify a formal simulation education and debriefing process that was based in educational theory and practice (Rudolph et al., 2008). Rudolph et al.’s four step process of advocacy inquiry is:

1) note salient performance gaps related to predetermined objectives, 2) provide feedback describing the gap, 3) investigate the basis for the gap by exploring the frames and emotions contributing to the current performance level, and 4) help close the performance gap through discussion or targeted instruction about principles and skills relevant to performance. (p. 1010)

**High-fidelity simulation.** High-fidelity simulation utilizes computer-controlled manikins that breathe and talk, also known as simulators, in place of patients to allow for adverse events without harming actual patients (Cooper & Taqueti, 2008). Manikins, originally starting with the Rescue Annie CPR manikin, have evolved to be full body computer manikins suitable for training vital sign monitoring, auscultation, patient communication, and performance of medical and surgical techniques (Cooper & Taqueti, 2008). At the turn of the 21st century, manikin simulators started to be produced in several forms, including less costly basic ones for educational use (Grenvik & Schaefer, 2004). This development of less costly and more accessible high fidelity computer manikins in the early 2000s moved simulation education out of
large medical hospitals and into education programs where they are readily available for use in classrooms (Wang, 2011).

The more frequent use of manikin simulators in both student and continuing medical education has grown out of evidence of their success in increasing patient safety and decreasing errors (Curtis et al., 2012). This has increased medical practitioners’ preparedness (Mathai et al., 2014). Successful student outcomes with high fidelity simulation in medicine have led to its expansion into other healthcare fields including nursing, social work, and physical therapy (Dreifuerst, 2009; Nimmagadda & Murphy, 2014; N. Smith, et al., 2012).

**Low-fidelity simulation.** Simulation utilizing low technology manikins and human actors is referred to as low-fidelity simulation (Shoemaker et al., 2011). An actual person trained to be a patient is referred to as a standardized patient. Low fidelity simulation is used in medicine and other professions when the educational objectives require the use of a standardized patient, such as communication objectives or musculoskeletal tests and measures (Paparella-Pitzel, Edmond, & DeCaro, 2009; Rickles, Tieu, Myers, Galal, & Cheng, 2009).

**Simulation and interprofessional education.** Interprofessional education is defined by the World Health Organization to be education that takes place “when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes” (World Health Organization, 2010). Interprofessional education with simulation has been identified as a feasible approach (Ayres-de-Campos, Deering, & Siassakos, 2011). Interprofessional learning often occurs in medical simulation centers that resemble a hospital setting, where health professions work collaboratively in a space where competencies can be practiced in a realistic team environment (Nimmagadda & Murphy, 2014; Smithburger, Kane-Gill, Kloet, Lohr, & Seybert, 2013).
Successful student outcomes have been noted with interprofessional simulation. Smithburger et al. (2013) have discovered that students perceive simulation as a preferred method of interprofessional education and a worthwhile use of their time. Buckley et al. (2012) identify simulation learning as able to increase student and faculty awareness of how health profession students differ in their understanding of their role in team based care.

Nimmagadda and Murphy (2014) conducted a simulation experience that required students to achieve learning objectives of patient communication, team communication, and family communication in a professional and direct fashion. The researchers had nursing and social work students work as a team during the interprofessional simulation. This requirement demonstrated that learning objectives of teamwork were clearly met, as both nursing and social work students conveyed the value of teamwork, communication, and respect after the simulation.

Successful implementation of interprofessional education through simulation is linked to faculty commitment (Treadwell & Havenga, 2013). Multiple research studies on interprofessional simulation report faculty resistance as a common limit on its success. C. Baker et al. (2008) have uncovered resistance within interprofessional teacher focus groups where faculty participants were positive about the student learning that occurred, but were discouraged by the intensive faculty time and resources needed to teach with simulation. Nimmagadda and Murphy (2014) find that although interprofessional simulation demonstrates that the learning a student obtains is beneficial, the intense time and faculty resources are an important drawback to simulation education.

**Learning theory and simulation education.** Several learning theories are used to understand simulation education, as briefly reviewed below.
Theory of reflection. Simulation requires reflection, which has been theorized to assist students in learning critical thinking (Schön, 1987). Simulation using debriefing with an explicit focus on self-reflection skills has been shown to increase students’ clinical decision-making (Forneris et al., 2015).

Theory of self-efficacy. Bandura’s social cognitive theory (1993) has been utilized to explain the role simulation has in enhancing students’ self-confidence and performance. Social cognitive theory posits a direct relationship between a student’s self-efficacy and his or her level of performance (Bandura, 1993). Increased self-efficacy has been found with simulation education in several research studies (Laschinger et al., 2008; Ohtake et al., 2013; Shoemaker et al., 2009; N. Smith et al., 2012).

Emotional intelligence theory. Emotional intelligence refers to one’s ability to appropriately express and assess one’s own emotions, as well as understand the emotions of others (Salovey & Mayer, 1990). Clinical decision-making requires affective and professional behaviors associated with emotional intelligence (Goleman, 2006). Cherry, Fletcher, O’Sullivan, and Shaw (2012) conducted a systematic review of articles pertaining to simulation and emotional intelligence in physicians, and concluded that a positive relationship exists.

Kolb’s learning theory. Kolb’s learning theory posits that a combination of experience, reflection, conceptualization, and experimentation are needed to foster learning (Kolb, 1984). Fanning and Gaba (2008) cite Kolb as a foundational basis for simulation instruction. Grant and Marriage (2012) report that Kolb’s experiential learning theory has guided the successful construction and implementation of medical simulation centers. Poore, Cullen, and Schaar (2014) conclude that simulation is a concrete way for learners to reflect and follow Kolb’s learning cycle.
**Transformative learning theory.** Transformative learning theory explains that a meaningful context can transport an adult learner into a new reality by moving through ten purposeful stages of learning (Mezirow, 1991). Scorgie (2010) demonstrates a transformation in students’ learning with simulation education that lasted into the subsequent year of practice. Frederick, Cave and Perencevich (2010) find that student teachers’ learning was transformed using a semester long course with simulation. In this course, faculty were able to use simulation to recognize students’ learning needs, and the simulation experience provided the opportunity for attainment of new knowledge that would inform their practice.

**Simulation Education in Physical Therapy**

To understand the evolution of simulation education in physical therapist education, a brief overview of physical therapist education is warranted. A physical therapist program curriculum is comprised of basic science courses, clinical content courses that encompass specialty practice settings, and integration and research courses that elevate critical inquiry and clinical decision-making to the high level necessary for a doctoral degree. Each program in the United States is accredited by the Commission on Accreditation for Physical Therapist Education (CAPTE), and an individual program’s curriculum is guided by the *Normative Model of Physical Therapist Education* (American Physical Therapy Association, 2004). There is great latitude in the pedagogy, structure, and order each program utilizes to graduate a competent entry-level doctor of physical therapy. Programs may choose to employ any educational methods they deem appropriate, but simulation is not specifically required.

Each physical therapist education program focuses on instruction that fosters clinical decision-making for entry-level practice. However, research into educational practices that prepare students for this is lacking due to the limited use of educational theory and insufficient
funding and structure (Gwyer, Hack, Jensen, Segal, & Boissonnault, 2015). Gail Jensen, a physical therapist scholar-practitioner-educator, summarizes the importance of educational theory in physical therapist education in her Mary McMillan lecture, entitled “Learning is What Matters Most” (Jensen, 2011). Jensen describes students’ need to understand the situation, not just the decision, and move beyond critical thinking and reflection to metacognition. Jensen describes physical therapist education as using a combination of social and cognitive learning theory, cultural learning theory, and motor control learning theories to assist students with mastery of the profession.

In clinical practice, physical therapists utilize a combination of narrative reasoning, which is understanding and engaging with a patient’s experience, and diagnostic reasoning, which determines diagnosis, impairments, and treatment focus. This combination is known as dialectic reasoning; a physical therapist moves between these two reasoning processes to make appropriate decisions in a patient specific individual context (Edwards, Jones, Carr, Braunack-Mayer, & Jensen, 2004). Simulation is a learning method that requires simultaneous psychomotor, social, and cognitive tasks, followed by skilled reflection, which has been used to meet this established need of learning: to understand the situation, not just the decision.

The integration of medical simulation as a teaching method into physical therapist education has not moved at the same pace as it has in other health professions. While medical education began using simulation over 30 years ago, even low-fidelity standardized patients were reported to be used in only about 30 percent of the physical therapist programs in the United States and Canada in 2005 (Paparella-Pitzel et al., 2009). One of the first published uses of high-fidelity simulation in physical therapist education was undertaken by Shoemaker et al. (2009). Through solicitation of student feedback after participating in a critical care high-fidelity
simulation requiring clinical decision-making and psychomotor performance, the researchers
document students’ reports of positive feedback and increased preparedness for their acute care
clinical placements after the experience (Shoemaker et al., 2009). This research, however,
lacked a standardized process for quantitative or qualitative analysis, limiting its findings.

The primary reason to use simulation in physical therapist education has been to teach
acute care hospital based practice, which closely emulates its use within medicine. Research has
demonstrated acute care therapists’ need to possess skilled reflection and an ability to think
differently than other types of physical therapists in part, because they make decisions when
faced with dilemmas while caring for patients in medical crisis (Masley et al., 2011). In order to
be competent, acute care therapists require a learned decision-making process that relies heavily
on the therapist’s interprofessional relationships with the medical team, management of his or
her own emotions, and previous experiences so he or she can make judgments and take actions
that are best for an individual patient’s circumstances (Holdar, Wallin, & Heiwe, 2013; Masley
et al., 2011; M. Smith, Higgs, & Ellis, 2010). The learning needs of acute care physical
therapists provide an opportunity for simulation education.

Student perceptions and confidence in acute care physical therapy using high-fidelity
simulation have been assessed in physical therapist education. Silberman et al.(2013) examine
changes in student confidence after participating in simulations of specific components of acute
care clinical decision-making. These components included interprofessional communication and
discharge decisions, which are essential to the acute care clinical decision-making process.
Results of the simulation experience indicated that students accepted simulation as a method for
clinical preparation, increasing their confidence and satisfaction. Further success in
documenting students’ increased confidence with simulation is reported by Ohtake et al. (2013),
who find positive results in student confidence after participation in a complex intensive care unit simulation.

**High-fidelity simulation within physical therapy.** High-fidelity simulations targeting clinical decision-making have been conducted by N. Smith et al. (2012) and Bednarek, Downey, Williamson, and Ennulat (2014). N. Smith et al. (2012) link high-fidelity simulation participation to significant increases in student confidence and ability to analyze electrocardiograms. Bednarek et al. (2014) examine three separate high-fidelity simulation experiences designed to have students perform various clinical skills throughout a single cardiopulmonary physical therapy course. Students reported increased confidence and reported benefitting from exposure to the environment. It is important to note that students also reported that using the manikin computer was only somewhat realistic because it did not move as easily as a human patient.

**Low-fidelity simulation in physical therapy.** Use of standardized patients, human beings who act as pretend patients, has been utilized in physical therapist curricula for several years, after being proposed as cost effective and beneficial to students’ learning by Black and Marcoux in 2002. Standardized patient experiences in PT education have been undertaken to examine students’ abilities and perceptions and to examine how students think. Brueilly, Nelson, Gravano, and Kroll (2009) have examined students’ perceptions of their own learning by implementing two standardized patient exercises commonly encountered in the acute care setting within a didactic course. As of 2005, standardized patients were used in one-third of physical therapist programs (Paprella-Pitzel, et al., 2009). There is no more recent data on the number of programs that currently use standardized patients.
Research focused on examining a student’s learning clinical decisions, rather than his or her perceptions, has been undertaken to provide insight into how simulation works for physical therapist education. Cahalin, Markowski, Hickey, and Hayward (2011) use a standardized patient experience to examine the clinical reasoning process physical therapy students undertake while treating a patient with cardiopulmonary disease. In this specific standardized patient experience, incorrect clinical decisions were identified. After students reflected on their performance through feedback and decision trees, they were able to understand where their decisions fell short (Cahalin et al., 2011).

**Simulation and clinical education.** In recent years, increased attention has been given to understanding the relationship between simulation education and clinical education performance. High-fidelity simulation in physical therapy has demonstrated improved preparedness for clinical education (Nithman et al., 2016). Students who participated in simulation education prior to clinical education experiences had increased preparation, demonstrated greater patient safety skills, and improved communication compared to those who did not (Silberman et al., 2016). Mori et al. (2015) state after systematic review that simulated learning environments can replace up to four weeks of part-time clinical hours in physical therapist education, but caution that more rigorous research is needed prior to changing standard curriculum. Despite recent research, simulation is currently not allowed to replace clinical education.

**Simulation Faculty**

Faculty instructors in medical simulation must have the basic skills to be an educator and a simulation expert if they are to create and execute scenarios for successful student learning (Der Sahakian et al., 2015). The faculty member is the facilitator of student learning with simulation and is responsible for ensuring that proper execution and technique are followed for
optimum learning (Lyons et al., 2015). Faculty have an active role and are present throughout the simulation to lead skilled debriefing that assists students with learning (Fanning and Gaba, 2007).

Literature reviewed on simulation provides rich information on student involvement within simulation, but lacks substantial information on the faculty role. The reader must extract the faculty member’s importance from the information given. For example, Dreifuerst (2009) remarks that well-written learning objectives are necessary for success; these can only be created if faculty are trained to do so. The faculty responsibility to assist students in incorporating their own positionality is essential to sustaining simulation education programs (Glavin & Maran, 2003). Wang (2011) posits learning with simulation in medical education requires that students be taught a combination of factual knowledge and skill practice as well as incorporation of real-life experiences, which can only be done through faculty involvement.

The role of the faculty member in debriefing was studied by Dieckmann et al. (2009), who say the faculty member must be flexible with learning objectives and understand the variability among the targeted learners. Faculty must be able to take on several roles and views within a simulation debriefing, and vary these roles as needed by the situation.

Assessment of faculty members’ debriefing ability is necessary to understand their ability to teach with simulation. The Debriefing Assessment for Simulation in Healthcare (DASH) and the Objective Structured Assessment of Debriefing (OSAD) are used to assess faculty performance during debriefing. Each of these tools provides a method of assessing the structure and methods faculty use in debriefing (Cheng et al., 2015).

Only one study was found that examined the impact of faculty participating in a physical therapist simulation (Cahalin et al., 2011). In this instance, the faculty member who taught with
simulation made changes to his instruction based on the students’ observed performance during
the simulation. This demonstrates how one instructor’s own reflection on his teaching
experience led to curricular changes that were designed to increase student preparedness for the
clinical environment (Cahalin et al., 2011).

**Faculty development.** Training of the faculty member is recommended for successful
simulation, including proper simulation debriefing (Der Sahakian et al., 2015). Faculty may
attend formal training programs, degree programs, or fellowships (Cheng et al., 2015). The
Society for Simulation in Healthcare has a Certified Healthcare Simulation Educator certification
with a standard examination and application process (Society for Simulation in Healthcare,
2016). Training to be a skilled simulation instructor requires time and commitment (Cheng et
al., 2015). Training the trainer programs where simulation instructors train and mentor other
faculty are also used, but this method requires a well-developed curriculum if it is to be
successful (Kordowicz & Gough, 2014).

The United States armed forces simulation program asserts that it is essential to have an
organizational framework that includes faculty training and development (Deering et al., 2012).
Faculty training and development should recognize that medical simulation is not a technical
skill easily taught in a didactic lecture. Kordowicz and Gough (2014) report training must
include understanding of the trainer’s emotions and feelings as well as his or her own time and
resources. Each of these previously established simulation and education programs provide
consensus that faculty education is essential to communicating the needs and vision of a
simulation center, program, or organization.

Training faculty costs time and resources. Glavin and Maran (2003) state that simulation
can be effective in teaching non-technical skills, but there is a significant obstacle within any
organization that is implementing it, namely the faculty resources available for education and training. Nimmagadda and Murphy (2014) report cooperation from faculty colleagues is beneficial to success, while resources and faculty time are barriers to that cooperation.

The quantity and quality of actual faculty training is variable. For example, a study on nursing by Forneris et al. (2015), notes that all four instructors were trained in the simulation debriefing methods used to enhance clinical reasoning in nursing students. However, in Treadwell and Havenga’s (2013) study of nursing interprofessional simulation, none of the faculty had any formal simulation training. In reviewing recent studies specific to physical therapy, N. Smith et al.(2012) do not mention formal training of instructors. Ohtake et al. (2013) utilize trained simulation debriefers. Nithman et al. (2016) state that the absence of faculty training for uniform facilitation is a limitation to their study. Silberman et al. (2016) report a certified simulation educator reviewed the simulation created by faculty.

The variety in level and method of training of simulation instructors limits the understanding of the faculty role and experience. This limitation may have an impact on the variety of study designs and outcomes, in that some simulations had immediate debriefings and others had alternative formats such as debriefing on the following day. The inconsistency among the different faculty may limit the generalizability of findings for future simulation practice in physical therapy.

Summary

This literature review was conducted to provide an understanding of what was known about simulation education in health professions and physical therapy, as well as the specifics of the faculty role within simulation. The literature examined presents simulation education as an established pedagogical practice in medical education and an evolving practice in physical
therapist education. An understanding of the faculty role with simulation education is inhibited by the limited amount of published research.

Knowledge of the historical context of medical simulation as an established educational method in higher education is common among early historical simulation articles and seminal authors and researchers in the field. Simulation education emphasizes debriefing to assist students with reflection and apply their new knowledge to practice. Debriefing follows several formats, but its importance was consistently asserted. Medical simulation takes place in a variety of disciplines, demonstrating the breadth of its use in health professions education. Simulation is used in singular professions as well as in interprofessional education. Simulation is aligned with educational theory, including transformative learning theory, which is the framework for this proposed study.

This examination of simulation in physical therapist education demonstrates benefits in students’ increased confidence and the acceptance of simulation as an educational method for acute care practice. Physical therapy has incorporated simulation education at a slower pace than medical education, which may explain the limited studies available about the outcomes associated with physical therapist simulation education. Simulation as a method for clinical education is not a current standard in physical therapist education programs.

A limited number of scholarly works were found that explain the faculty role in simulation. Faculty are seen as essential to the debriefing process, but other aspects of their role were not explicitly emphasized in the literature. Faculty training is important to successful simulation education, yet training scope and practice vary. Trained simulation instructors are used inconsistently in physical therapist education.
This literature review informed the research process by providing knowledge of simulation education and identifying limitations to scholarly work surrounding the faculty experience. The information from this literature review informed the researcher about implications of the research participants’ practice. Information gained through this review informed the study’s purpose: to understand how individual physical therapist faculty members who use simulation in their teaching practice make sense of their experience.
Chapter III: Methodology Overview

The purpose of this study was to understand how individual physical therapist faculty members perceived their experiences with simulation education as part of their teaching practice through interviewing individual physical therapist faculty members from across the United States. Transformative learning theory was used as the theoretical framework (Mezirow, 1991). This study promoted a deeper understanding of faculty perceptions of their experience using simulation education as part of their teaching practice, and added knowledge to the practice of simulation education in physical therapist programs.

Research Question

How do physical therapist faculty members make sense of their experience with using simulation in their teaching practice?

Research Paradigm

A researcher uses a paradigm of inquiry to clarify the direction of the research (Merrriam, 1991; Ponterotto, 2005). This study used qualitative research methods to understand and interpret individual physical therapist faculty members’ experience of teaching with simulation (Denzin & Lincoln, 2000). This study was conducted using the constructivist-interpretivist framework, thus the researcher worked closely with participants to interpret the multiple realities of each participant’s experience (Ponterotto, 2005). Use of the constructivist-interpretivist paradigm guided this researcher away from identifying an outcome of simulation education and towards a shared understanding of the particular situation and experiences of the physical therapist faculty being studied (Merriam, 1991). Following this paradigm, the researcher did not look to identify a critical finding regarding the faculty experience, but rather to explain the multiple processes or behaviors that occur among individual faculty members (Ponterotto, 2005).
The role of the researcher in a constructivist-interpretivist paradigm is subjective, in that the researcher can incorporate her own experiences and interests into her interpretation (Maxwell, 2005). Subjectivity was embraced by the researcher as significant to the outcome of this study (Ponterotto, 2005). The researcher created a shared conversation through multiple interviews with faculty who had similar educational backgrounds and experiences. The researcher accepted her place within this study and embraced the shared research practice of the constructivist-interpretivist perspective to allow a new understanding to take place (Ponterotto, 2005).

**Research Design**

This research utilized an interpretive phenomenological analysis (IPA) approach to understand how individual faculty members who teach with simulation make sense of their own experiences. The IPA approach used multiple shared conversations between the researcher and a small group of participants to understand each participant’s individual story concerning the research phenomenon (J. A. Smith, 2007). Use of IPA methodology is found in psychology and social sciences as well as in healthcare education (Dowling, 2007; Pietkiewicz & Smith, 2014). IPA has been used to understand patients’ experiences with medical conditions commonly encountered in physical therapy and to understand the experience physical therapists encounter when treating their patients (Bramley & Etough 2005; Jeffrey & Foster, 2012; Osborn & Smith, 2015).

In this study each participant shared the common experience of teaching with simulation in physical therapist education. Using an IPA approach, the researcher deeply explored each of the participants’ stories until a full understanding of each story was found. The IPA process identified commonalities shared among participants, however, the primary focus of IPA in this
study was to present several individual stories, not describe a collective phenomenon (Larkin, Watts, & Clifton, 2006; J. A. Smith, 2004; J. A. Smith et al., 2009).

Research Tradition

Interpretive phenomenological analysis is a qualitative constructivist method of inquiry that looks to understand how individuals have interpreted their own experiences with a particular phenomenon (Larkin et al., 2006, J. A. Smith et al., 2009). Interpretive phenomenological analysis has epistemological roots in phenomenology and hermeneutics (J. A. Smith et al., 2009).

Phenomenology seeks to describe a phenomenon that occurs in life (Larkin et al., 2006). The study of phenomenology flowed from the philosophical tradition of understanding the meaning of experience. Husserl is credited with identifying phenomenology as the study of examining the human experience (J. A. Smith et al., 2009). Phenomenology allows each person to have his or her own reality and accepts that what occurs with a phenomenon is based on collective experiences and not one single truth (J. A. Smith et al., 2009). The practice of phenomenology examines the human experience through several viewpoints, thereby transcending the meaning of the experience to a level where people can learn about it (J. A. Smith et al., 2009). This process requires intentional thought and consideration of the experience in order to understand it. Phenomenology as a research method seeks to achieve “explicit reduction” as the researcher explicitly examines people’s conscious thoughts and memories of an experience to describe the core structure of the experience itself (J. A. Smith et al., 2009).

Merleau-Ponty (1963) further developed phenomenology to describe the embedded experience. The embedded experience demonstrates that a person’s experience is dependent on a person’s view of the significance of the experience combined with that person’s view of the world itself. This explanation allows us to understand that an experience is interpreted in the
context of the world in which it occurs (Merleau-Ponty, 1963). Sartre extended Merleau-Ponty’s
description by emphasizing that a person’s free will impacts his or her actions within the
experience (J. A. Smith et al., 2009). This action is done through a complex decision-making
process based on a person’s relationships and prior experience. Each of these seminal authors of
phenomenology illustrate that an experience is not a single truth or event, but instead is a
complex personal process (J. A. Smith et al., 2009).

Hermeneutics, founded by Heidegger, is defined as the study of the interpretation of an
experience (J. A. Smith et al., 2009). Hermeneutics asserts that humans interpret their own
experience with a phenomenon from their own perspective (Heidegger, 1962). This
interpretation is impacted by prior experience, relationships, and the timing of the experience
itself (Heidegger, 1962).

Founders of interpretive phenomenological analysis credit phenomenology and
hermeneutics with contributing to the epistemological position of the method (J. A. Smith et al.,
2009). Although the IPA approach embraces phenomenology and hermeneutics, the method is
not a subset of phenomenology. IPA is a unique research process that moves the focus away
from describing a phenomenon and towards seeking to interpret how the individual understands
his or her own particular experience (J. A. Smith et al., 2009; Larkin, Eatough, & Osborn, 2011).

In interpreting individual experience, the IPA researcher is concerned with ideography, or
the focus on the particular (Pietkiewicz & Smith, 2014). This focus on the particular requires in-
depth examination of each individual participant in the study. In order for the researcher to
interpret an individual’s understanding of his or her particular experience with IPA, the
researcher must assume a subjective position within her own research (Larkin et al., 2006). This
subjective position requires the researcher to have prior experience with the phenomenon being
studied. Use of this subjective position allows the researcher to influence the depth of the research by building a trusting relationship with the participants (Pietkiewicz & Smith, 2014). Research methods used in IPA elicit shared conversations between the researcher and each individual participant. These shared conversations lead to a double hermeneutic interpretation in which the researcher is making sense of how the individual is making sense of the experience (Pietkiewicz & Smith, 2014).

Challengers of IPA claim that the level of subjectivity in this method decreases the rigor of the study. Murray and Holmes (2014) posit that IPA requires a presumption of subjectivity that is not questioned and leads to a subjective outcome. Supporters of IPA address this caution through emphasizing that subjective outcomes are the purpose of IPA. IPA seeks to understand a participant’s subjective interpretation of what is happening during a specific life circumstance through a shared interpretation between the participant and the researcher (Larkin et al., 2006). J. A. Smith et al. (2009) emphasize that when using IPA, the researcher must follow a flexible but detailed approach thoroughly and thoughtfully to create results worthy of scholarly acceptance. Prior research using IPA that has not heeded J. A. Smith et al.’s (2009) advice has led to criticism, in that IPA has been associated with poorly constructed studies and limited findings (Hefferon & Gil-Rodriguez, 2011). These cautions illustrate that it is important for an interpretive phenomenological analysis study to be conducted using a detailed approach that presents subjectivity through thoughtful analysis and supports research findings with detailed descriptions of the participants’ words and the researcher’s thoughts.

Justification of IPA Approach

The interpretive phenomenological analysis focused this research on examining the unique experience of each faculty participant and presenting the multiple realities of simulation
education within physical therapist education (J. A. Smith et al., 2009). The choice of IPA methodology provided an opportunity for the researcher to examine a world she is a part of. This examination occurred through a shared research process between the researcher and a small group of physical therapist faculty who had experience with simulation education (Larkin et al., 2011). Use of IPA methodology in this study structured how the researcher used her own subjectivity as she interpreted the stories of this small set of physical therapist faculty (J. A. Smith et al., 2009). The knowledge gained from this study advanced the educational practice of simulation through illustrating faculty member’s individual experiences when they teach with simulation.

**Participants**

Participants were eight physical therapist faculty members who had experience teaching with simulation. Each participant met the criteria of the participant sample. Participants were licensed physical therapists who teach in an accredited physical therapist program in the United States. Participants had used simulation education as a teaching method in their practice for a minimum of one year. It was not expected that participants in this study would have a common or standard training in simulation because of the variety of ways simulation is learned, from being self-taught to completion of a formal instructor education program. Participants’ individual training was explored in the study. Faculty from the researcher’s own institution were excluded to allow for a larger breadth of participants. Each participant was proficient in the English language and expressed a common use and understanding of the principles of simulation education. Faculty who taught with simulation in any physical therapy course or content area, regardless of focus, were included. This inclusion was necessary as the limited number of faculty who use simulation in physical therapy programs in turn limits the overall population
available for participation in this study. To verify that participants met these criteria, they were screened using four questions emailed by the researcher after a faculty member contacted her (Appendix A). All participants were notified of their acceptance in the study after the screening process was complete (see participant inclusion email Appendix B).

**Recruitment and Access**

The IPA method utilizes multiple semi-structured interviews over a period of time with a small sample size (J. A. Smith et al., 2009). This study had eight participants. Participants were recruited through:

- Email invitation (Appendix C) sent to simulation educators the researcher knows through her professional and personal outlook contacts that have been established through course invitations, professional development, business and association meetings, or previous educational relationships, including business cards and contacts she received when presenting or attending physical therapist educational sessions and/or research activities.
- Emails sent to authors of journal articles that relate to teaching physical therapy through simulation using the author’s contact email printed with the article.
- A snowball sample built from the initial participants selected.

**Protection of Human Subjects**

The researcher completed an institutional review board (IRB) through Northeastern University’s Office of Human Subject Research Protection.

Specifically, the IRB outlined that:

1. Unsigned consent would be provided (Appendix E).
2. Interviews would be transcribed into a readable transcript using a transcription service.

3. Each participant would be provided a copy of the transcripts after his or her first two interviews. These would be reviewed for any comments, edits, or inconsistencies to ensure accuracy before data were analyzed.

4. Names of participants and location of their institutions would be removed to provide anonymity, and only general demographic data would be used to describe the participants. A list of demographic data that would be requested of participants is available in Appendix F. These demographics were necessary so readers could understand the participants’ positionality and experience, and so readers could more easily apply the research findings to their own practice.

Data Collection

Following the best practices of interpretive phenomenological analysis, data were collected from three semi-structured interviews with each participant, as illustrated in Figure 1 (J. A. Smith et al. 2009). The initial interview was done to gain both demographic information and the participant’s initial story. The second interview was conducted to gain further insight into the individual’s story and inquire further about the participant’s story as identified in the initial analysis (J. A. Smith et al., 2009). The third and final interview took place after the researcher and participant had reviewed the first two transcripts. The third interview was a final conversation focused on further clarification or final thoughts with the participant. A semi-structured interview process was used whereby the researcher allowed the interviewee to lead the interview and create a conversation focused on the participant’s thoughts about the experience (J. A. Smith et al., 2009). The semi-structured interview questions were designed to uncover the
participant’s story “sideways” rather than formally in a top-down fashion (J. A. Smith et al., 2009, p. 1221). Semi-structured interview questions and protocol are found in Appendix G.

Figure 1. Data collection flow chart.

To ensure data collection would include multiple interviews, an interview schedule was used to establish a timeline for the participants and the researcher (J. A. Smith et al., 2009). Participants were instructed to expect to take part in three in-depth interviews involving six to ten open-ended questions; each interview would last no longer than 90 minutes (J. A. Smith et al., 2009). All interviews were video and audio recorded using Google Hangout or Skype technology. This was necessary as participants were from across the country. When possible, two simultaneous recordings were made, to ensure no data would be missed. Interviews were transcribed to a readable transcript for analysis by a transcription service (J. A. Smith et al., 2009). Please see Table 1 for the interview timeline.
All audio files and transcribed interview data obtained through this research were stored in three places: (a) the researcher’s password-protected laptop, (b) a flash drive locked in the researcher’s office for backup storage, and (c) the password protected MaxQDA software program used solely by the researcher. Only Northeastern University email was used to communicate with the researcher’s dissertation committee and participants. Each individual on the dissertation committee was included in the IRB and had undergone research subject protection training.

In addition to the researcher’s dissertation committee, a transcriptionist service had access to this data. The transcriptionist signed a confidentiality agreement and stored information in a confidential password-protected online folder. An editor was used in the final writing of the dissertation but was not given access to the data itself. Transcripts and video/audio files will be destroyed seven years after the study is complete. Completion is defined as the dissertation
being accepted and printed, along with subsequent publications also being in print. This is
necessary as editors of future publications may request additional details that would require
access to the original data.

**Data Analysis**

There is no single uniform method for data analysis using IPA. J. A. Smith et al., (2009)
emphasize that interpretive phenomenological analysis is not a prescription, but rather an
examination of how the researcher makes sense of the data collected to provide a narrative story
of the participants’ own sense-making.

In using IPA, the researcher spent significant time examining the data collected through
reading and re-reading each transcript for a general understanding of the individual participant’s
story and the dialogue that occurred between the participant and the researcher (J. A. Smith et al.,
2009). Data were coded in this initial process using iterative and inductive codes that had a
continual focus on the purpose of IPA, to make sense of the participant’s own point of view (J.
A. Smith et al., 2009). The researcher made use of annotated memos throughout this coding
process to record her own thoughts on what she was doing and thinking. A total of 149 memos
were recorded by the researcher. These memos followed four categories: (a) data tracking, such
as ensuring participants could be identified only to the researcher; (b) further questions the
researcher wanted to ask participants in follow-up interviews; (c) connections with the research
question and theoretical framework, included when the researcher decided not to code data
because it was off topic or the participant requested that it be omitted; and (d) the researcher’s
thoughts on her own positionality, recorded to ensure the researcher was using her subjectivity to
interpret the participant’s story, and not making a connection with her own experience. Examples
of these research memos can be found in Appendix H.
After reading, the initial coding of data was done through study notes and thoughts on the data with the aim of identifying descriptive comments that focus on what the participant feels is important, then linguistic comments to mirror the language used by participants, followed by conceptual comments in which the researcher interpreted the data to determine themes (J. A. Smith et al., 2009). Throughout the analysis process the researcher used analytic memos to record her thoughts on the coding decisions she made. After thoughtful and thorough analysis to represent the researcher’s understanding of each participant’s individual story, the final themes were presented as findings.

**Presentation of Findings**

After thoughtful and thorough analysis using an IPA approach which represents the researcher’s understanding of the participants’ stories, five super-ordinate themes and nine subordinate themes were uncovered. These were created based on the process illustrated in Figure 2. The data analysis was subjective and the researcher’s own subjectivity was embraced, not bracketed, as is common in other types of qualitative research (Larkin et al., 2011; J. A. Smith et al., 2009). Presentation of themes included excerpts from the data itself to support the researcher’s interpretation of the data and provide evidence for transparent research (J. A. Smith et al., 2009). The final presentation of findings was a narrative of the stories the researcher uncovered with IPA analysis supported by interview transcript excerpts and the researcher’s own annotated memos to present the double hermeneutic interpretation of the individual experience (J. A. Smith et al., 2009).
In IPA analysis there is interconnectivity through prolonged interviews where the researcher and the participants have a relationship that is beneficial to the research (Larkin et al., 2011). As a simulation educator the researcher shared common ground with her participants, which assisted with building a trusted relationship with the participants (Fetterman, 2010). Trustworthiness for participants and the reader was also achieved through transparency of the data. Steps to increase transparency included (a) giving the reader summary demographic information on each participant to understand the sample; (b) providing participants access to their first two transcripts to review for any changes, clarification, or request omissions to maintain anonymity; and (c) utilizing the follow-up interview approach. This approach allowed data to be reviewed prior to developing further questions for the third interview. This led to a deep uncovering of each participant’s story (J. A. Smith et al., 2009).
Validity

With this research, the interpretation of the individual participant’s experience is influenced by the researcher’s own experience, or from the researcher engaging with multiple participants. J. A. Smith et al. (2009) note that while subjectivity is embraced, sensitivity to context is necessary to establish validity with IPA. Sensitivity to context was achieved through several steps: (a) an examination and utilization of supportive literature informed the research process; (b) three rigorous interviews took place, with clarifying questions that were focused on the participant’s story through an empathetic conversation; (c) findings were well supported with transcript excerpts to support identified themes and not conclusive arguments; and (d) the researcher’s thoughts and decisions were recorded in analytic memos.

Although the researcher’s positionality assisted with understanding how fellow simulation educators made sense of their experiences, she was conscious of her own subjectivity. Methods for ensuring data and findings presented were an accurate representation of the participant’s words included a readable transcription for analysis and member checking (Lincoln, Lynham, & Guba, 2011) Member checking was done by providing participants access to their readable transcripts from the first two interviews to review after the conclusion of those interviews. This allowed participants to clarify anything they may have misrepresented and request removal of information, as well as provided the researcher with the ability to re-question participants on information from the first two transcripts.

Credibility

The first step to a credible study is ensuring the methodology chosen aligns with the proposed study purpose (J. A. Smith, et al., 2009). This study utilized IPA in a thoughtful and intentional way with a commitment to process and rigor by the researcher. Three individual
interviews that followed a flexible but structured timeline were used with each participant. Following the IPA methodology assisted with building the credibility of this study.

The researcher drew upon her dissertation committee to ensure her presented findings were clear and defensible. Three members of the dissertation team reviewed this research. The first and second readers were educational scholars with terminal degrees and experience in overseeing rigorous doctoral work. The third reader on the dissertation team had the role of content expert. This content expert is a well-regarded physical therapist educator who holds a both terminal professional degree and doctoral degree in epidemiology and is a trained, experienced medical simulation educator. The three-member review process provided an additional examination of the data to ensure that all aspects of the data were considered. They challenged the researcher to look at the data from several angles to describe the truest picture possible (Lincoln et al., 2011).

Summary

The purpose of this interpretive phenomenological analysis study was to uncover how physical therapist faculty members made sense of their experience of teaching with simulation to prepare students for physical therapist practice. This chapter justified the research purpose and the choice of research methods used in this sound study of inquiry supported by literature. The study was rigorous doctoral work conducted to understand the faculty experience of transforming students’ learning through simulation. Findings and discussion are presented in the following chapters.
Chapter IV: Research Findings

The purpose of this study was to understand how individual physical therapist faculty members perceived their experiences with simulation education as part of their teaching practice. This study used an interpretive phenomenological analysis approach to uncover how each participant made sense of his or her personal experiences. The study was guided by the following research question: How do physical therapist faculty members make sense of their experience with using simulation in their teaching practice? Data were collected through three semi-structured interviews with each participant, using questions developed through the lens of transformative learning theory.

Eight physical therapist faculty simulation educators participated in this study. Each participant had been using simulation education as part of his or her teaching practice from 3 to 19 years at the time of data collection. Participants have been given pseudonyms in this study to protect their anonymity. Table 2 provides an overall description of the individual participants, and Table 3 provides overall demographic information on the participant sample.

Table 2

<table>
<thead>
<tr>
<th>Participant</th>
<th>Years as a PT faculty member</th>
<th>Years teaching with simulation</th>
<th>Interprofessional simulation</th>
<th>Formal simulation training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne</td>
<td>13</td>
<td>6</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Barbara</td>
<td>8</td>
<td>9</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Connie</td>
<td>13</td>
<td>9</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Donna</td>
<td>19</td>
<td>16</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Erin</td>
<td>7</td>
<td>6</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Felicity</td>
<td>11</td>
<td>11</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Gordon</td>
<td>3</td>
<td>3</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Henry</td>
<td>10</td>
<td>8</td>
<td>Yes</td>
<td>No</td>
</tr>
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</table>
Table 3

Overall Demographics as a Percentage of Participant Sample

<table>
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<th>Demographic Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
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<td>Male</td>
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</tr>
<tr>
<td>Graduate program</td>
<td>100</td>
</tr>
<tr>
<td>Terminal degree Ed.D., Sc.D., Ph.D.</td>
<td>50</td>
</tr>
<tr>
<td>Currently enrolled in a terminal degree program</td>
<td>37.5</td>
</tr>
<tr>
<td>Northeast</td>
<td>62.5</td>
</tr>
<tr>
<td>West Coast</td>
<td>12.5</td>
</tr>
<tr>
<td>Midwest</td>
<td>12.5</td>
</tr>
<tr>
<td>Southeast</td>
<td>12.5</td>
</tr>
<tr>
<td>Program size over 50 students</td>
<td>62.5</td>
</tr>
<tr>
<td>Program size under 40 students</td>
<td>37.5</td>
</tr>
</tbody>
</table>

Participant Profiles

Eight physical therapist faculty members participated in multiple conversations with the researcher. Through these conversations, the researcher came to understand the participants as individuals. The individual participant profiles below provide insight into each participant’s unique experience.

Anne. Anne uses simulation as part of her teaching practice in clinical education. Her entry into academia was not planned; in her words, “I wasn’t really planning on going into academia but it was an open door that I said let me check this out.” She is glad to have found a home in academia, where she has worked full time for the past 13 years. Her clinical background is in cardiopulmonary and acute care. She has been teaching with simulation for the past six years and has taken several simulation courses, primarily focused on “simulation pedagogy” and “debriefing practices.” Her first training course provided her a structured method of simulation design and execution that she has used in her teaching practice from the start.

She describes adding simulation to her teaching practice as a way to increase her students’ “preparedness for acute care physical therapy.” Her simulation teaching practice includes a predominant focus on student outcomes. She currently uses simulation for acute care
and “interprofessional goals and objectives.” She reports she “want[s] to make sure that what we’re teaching them carries over to their clinical practice and it has value for them.”

Anne’s experience as a simulation educator and a clinical educator are interconnected. When she meets with students regarding clinical education experiences she is “able to ask them more insightful questions” through the facilitation techniques she has learned with simulation. She believes she is now interacting with students “in a more effective way.” Anne’s experience as a simulation educator contributes to her success and her desire to come to work each day. She expresses great enjoyment from her simulation experience with her students, which “keeps [her] engaged, and excited, and learning.”

Barbara. Barbara teaches with simulation across her curriculum. Her clinical experience is in geriatrics in multiple inpatient and outpatient settings. She considers herself “a teacher now, but a physical therapist first.” Barbara’s experience is unique in that she “was involved as a clinician first with simulation with the university and making recommendations on what we thought needed to go into simulation.” As a result, she has been teaching with simulation longer than she has been a full time faculty member.

Barbara is the lead simulation educator for multiple simulations that run within her physical therapist program. Many of her simulations have an “interprofessional focus.” She describes her current role as the “make it work girl” because her simulation center “does not have a technology and operations staff” to assist her.

Barbara’s experiences with simulation stem from using “constructivist methods” for student learning, which in turn come from her background and focus on curriculum and sound pedagogy. She engages in planning and execution of simulation experiences with a “sense of play,” and is “a person who wants to play and experiment.” She views simulations as a safe
place for students to learn to “make a mistake.” Despite Barbara’s focus on play, she is serious regarding her students’ learning with simulation. She wants her students to learn the correct path through trial and error.

Barbara’s experience includes the examination and education of simulation pedagogy. She assists other faculty “in designing the pedagogical aspects of simulation.” Barbara views talking about using simulation in her teaching practice as a way to educate others about simulation education. She feels “if we can have people that are interested within simulation, interested in it as a form of discourse within education,” then she can contribute to the enrichment of physical therapist students’ education.

Connie. Connie has been teaching in an accredited physical therapist program for 13 years and had several prior years of experience in a physical therapist assistant program. She is a senior faculty member at her institution and has used simulation in several courses throughout her curriculum. Her clinical experience is in acute care with a focus on neurological populations and geriatrics. She used simulation education in her teaching practice for several courses that align with her clinical expertise, such as patients with “neurological conditions and interprofessional team based care.”

Connie’s opportunity to add simulation to her teaching practice began when the simulation program housed in another discipline asked for other disciplines to participate. She seized this opportunity as a way to prepare her students for physical therapist practice “in the intensive care unit setting.” The addition of simulation to her teaching practice expanded her teaching practice as a whole.

Connie emphasizes collaboration in her teaching practice. She uses her collaboration with physical therapist colleagues to enhance her teaching by reviewing her
simulation cases with them. She asks them “is this even a patient that you would see?” In her experiences with interprofessional collaboration she has a dual purpose: to work as a team, and to defend the role of the physical therapist. She believes, “it’s very much an interprofessional team and if you’re not going to step up and make your point, people might walk all over you.” She attributes this thought process to her acute care experience.

Connie has undergone simulation training at several touch points since beginning teaching with simulation. She began with short logistical courses learning to write scenarios and learning to work as an interprofessional team. She admits some aspects were “self-learned” or learned through “observation.” Part of Connie’s teaching practice includes representing the physical therapist perspective during interprofessional collaboration with an associated medical school. Connie says she focuses on ensuring that whomever she speaks with understands her, and vice-versa. This goes beyond her students and was apparent in our discussions together:

I think for me some people who maybe haven’t, you know, read the literature about simulation, haven’t done a lot of simulation, they’ve got a particular preconceived notion of what it is, and I don’t always think that that’s necessarily the same notion that I have, so some of it is really making sure, does that actually make sense to you?

Despite Connie’s years of experience and training with simulation, she believes she is an advanced simulation teacher but “not an expert.” She does not “like feeling like I’m an expert at something.” She knows there is always more to learn.

**Donna.** Donna has been a simulation educator for the past 19 years and has the most experience teaching with simulation of all the study participants. Her current role focuses on “interprofessional simulation throughout her college,” where she leads an interdisciplinary team of “35 faculty.” Her initial experience with simulation was with standardized patients. As a
clinician, Donna works in almost every type of physical therapist setting with patients of all ages. She is currently working with older adults but has done pediatrics, “had an outpatient private practice”, worked in hospital-based settings and has done rehab and wound care and reports she “enjoys it all.”

Donna spends an average of “10 hours a week” using simulation in her teaching practice and her “whole scholarship line is in healthcare simulation.” Donna’s current experience is almost entirely focused on interprofessional simulation, but she had years of experience with physical therapist students in discipline specific simulations. As an expert she continues to refine her practice, looking “for new ways to measure the effectiveness of [simulation].” Donna is an established expert in simulation education among physical therapist faculty and medical simulation faculty in general.

**Erin.** Erin has been teaching with simulation for six years. Her clinical experience is in the area of “cardiopulmonary physical therapy” in acute and rehabilitation settings. She taught simulation within the cardiopulmonary content in her program. Erin began her simulation teaching after attending a formal simulation instructor course. This instructor training was an “an extremely enriching experience” for her and impacted her simulation teaching practice by placing her in a situation that required her “to have that feeling of really being on the edge of being quite uncomfortable.” The discomfort experienced with her training gave her insight into what her students would feel with simulation education.

Erin’s experience teaching with simulation assists her in her overall development as an educator. She reports she is “more effective and efficient,” and adding simulation to her teaching practice “helped my ability to lead a classroom discussion, or a small group discussion.” She acknowledges that she is a “fan of individualized learning as much as we can” and the use of
simulation in her teaching practice allows her to teach with smaller student ratios for individualized learning.

Erin’s current experiences with teaching and learning with simulation has led her to “get really frustrated that there’s really good evidence across health professions” but there is not the “support” to use simulation to the fullest extent in her program. She expresses a desire to expand the use of simulation in her teaching practice beyond her two courses, but because “I teach the classes by myself” she is unable to do more.

**Felicity.** Felicity has been teaching with simulation for 11 years, the same amount of time that she has been a faculty member. Her clinical experience is in the area of acute care, with a focus on treating patients in the intensive care unit setting. She describes simulation as “a gift from God” and emphasizes that the extensive resources and faculty staff support available through the center at her university assist her immensely with adding and continuing simulation education as part of her teaching practice.

Felicity did not undergo formal simulation training and describes herself as “a natural” at using simulation as part of her teaching practice. “It came to me; I wasn’t even looking for it.” She began teaching with simulation at a time when physical therapy simulation literature was not readily available, and she has been self-taught. She acknowledges that having training at the start “would have been nice, to have a little bit more background on simulation, the literature and the pedagogy” but when she started “nobody was really doing it.” Felicity’s initial experiences with adding simulation to her teaching practice without training were positive and she doesn’t know if there is anything she “would do over” if she had the opportunity.

Felicity states she “really care[s] about the profession” and has an intense passion for her students and their learning. She wants her students to be prepared for clinical situations. This is
apparent in many of her statements, most specifically with her choice to go against other simulation educators’ opinions and trust her own experiences. “I’ve had other faculty at other universities very critical of me because I have a simulator code and that doesn’t happen very often, but it happened to me.” This statement reflects her using her own clinical judgment to lead decisions in her teaching practice.

Felicity “loves teaching in this way,” and reports it is “much more valuable than lecturing to this generation.” She often expresses “I can’t think of any other way I could do that circularly than simulation.” She believes using simulation in her teaching practice is meeting the needs of her students.

Gordon. Gordon is the newest faculty member and simulation educator among the participants, with only three years of experience. His primary faculty role is clinical education and he has used simulation as part of his teaching practice since he began teaching. He reports it was “a job requirement” when he took his position. His clinical experience is in the area of acute care. Gordon teaches with simulation for “communication and interprofessional education,” focusing on acute care education as part of the educational preparation for students’ clinical rotations. He describes his experience with simulation as helping students “function within that interprofessional team in the world of healthcare.” His training began with one on one mentoring from another physical therapist faculty member, as well as nursing faculty. He has attended courses and training that developed his simulation teaching practice. Each of these courses assisted him with gaining expertise in simulation education, especially case design, debriefing, and interprofessional simulation.
Gordon relies on his prior clinical experience when creating simulations for his students. He uses prior situations he has seen in the hospital “where students struggle a little bit” to enhance student learning. Gordon’s teaching practice with simulation education evolved during his three years, especially the debriefing aspects. When he began he wanted to “just give the information on what didn’t go well, what went well and what needed to be improved,” and now he focuses on “facilitating the students to assess their own performance.” Gordon describes the evolution of his experience teaching with simulation as simultaneous with his overall teaching career given that he began them at the same time. He reports that having simulation education as part of his teaching practice carries over into his other exchanges with his students as well as with his own family. When he communicates, he tries to ask open-ended questions to facilitate learning and to give reflective responses to ensure understanding.

**Henry.** Henry has been teaching with simulation for eight years. His clinical experience is in the areas of geriatrics and cardiopulmonary physical therapy. He describes his faculty development and training with simulation as “totally self-learned,” having not taken any course work. He and two interprofessional colleagues at his university began their simulation practice by working together to investigate how to add simulation in their respective programs. Henry credits his program’s mission, which emphasizes the importance of simulation education, and its extensive resources as important components of his start and evolution as a simulation educator. Henry says his path to adding simulation education to his teaching practice was consistent with his overall personality, in that he learns by investigating something himself. Henry’s prior life experiences are essential drivers of his self-teaching. He describes himself as a person who investigates through “trial and error.” He is “the kind of person who, if my air-conditioner breaks I'm probably going take it apart and reverse engineer it.” He is “also a pilot,”
which required simulation as part of standard training. He feels he “brought that mindset to simulation,” as he learned to have a focus on making safe decisions.

Henry’s program curriculum includes multiple simulations in several clinical and interprofessional areas. He teaches with simulation in cardiopulmonary physical therapy, integumentary physical therapy, advanced clinical decision making, and interprofessional education. Henry’s “development as a faculty member really kind of came almost parallel with the development of the simulation program and resources” and occurred alongside the emersion of publications regarding simulation in physical therapy. When he began using simulation, there were fewer resources available than today.

**Findings**

Data analysis uncovered five super-ordinate themes and eight sub-ordinate themes. All of these themes emerged from equal or similar statements made by all eight participants. Table 4 provides an overview and definition of each of the super-ordinate and sub-ordinate themes. Table 5 demonstrates alignment of participants’ statements with each super-ordinate and sub-ordinate theme.

Table 4

<table>
<thead>
<tr>
<th>Super-ordinate Theme</th>
<th>Sub-ordinate Themes</th>
<th>Brief Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belief in a unique teaching methodology</td>
<td>Regarded as an acceptable teaching method</td>
<td>Simulation education is found to have universal components used by all participants: structured learning objectives, presence of debriefing, importance of fidelity, use of evidence, and outcomes assessment.</td>
</tr>
<tr>
<td></td>
<td>Creates a different space to experience student learning</td>
<td>Simulation is described as an active learning experience that fosters reflection, and provides faculty the ability to teach topics that are not learned well through other methods in an different way.</td>
</tr>
<tr>
<td>Development of the teaching practice evolves through experience</td>
<td>Influence of their other lived experience</td>
<td>The teaching practice of simulation is influenced by physical therapist faculty’s past and present life experiences.</td>
</tr>
</tbody>
</table>
Advancement in expertise through ongoing simulation practice | Faculty development and expertise evolves through ongoing experience.
---|---
Presence of academic constraints | Limited by practicality
Influenced by academic support | Simulation teaching practice is limited by their academic institution’s structure.
Influenced by academic support | Teaching practice is influenced by academic support or lack of academic support from their program, college, and/or fellow faculty.
Interconnectedness of simulation and interprofessional education | Fulfills interprofessional requirements of teaching
Importance of interprofessional collaboration | Simulation is a curricular method used to provide physical therapy interprofessional education and focus physical therapist students on interprofessional learning.
Transforming influence on their lived experiences | Working collaboratively with other health professions is part of the physical therapist simulation faculty’s experience and requires an ability to work together and understand each other’s roles.
Transforming influence on their lived experiences | Teaching with simulation contributes to professional, personal, or clinical transformations for faculty

<table>
<thead>
<tr>
<th>Participant</th>
<th>Unique Method</th>
<th>Development</th>
<th>Constraints</th>
<th>Transforming</th>
<th>Interprofessional</th>
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<tbody>
<tr>
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<td>Accepted</td>
<td>Students</td>
<td>Life</td>
<td>Experience</td>
<td>Teaching</td>
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</tr>
</tbody>
</table>

**Table 5**

**Participant Themes**

**Belief in a unique teaching methodology.** The first super-ordinate theme, *Belief in a unique teaching methodology*, captures the participants’ thoughts on their experiences with using simulation education as a separate and distinct teaching practice in physical therapist education. Each of the eight participants described a similar process of using simulation in their teaching practice and similar and sometimes identical statements on how their experiences with simulation differed from their experiences with other teaching methods. The first sub-ordinate theme, *Regarded as an acceptable teaching method*, illuminates the participants’ experiences
that established simulation as a structured teaching practice encompassing of teaching expectations. The second sub-ordinate theme, *Creates a different space to experience student learning* describes how faculty viewed simulation as a valuable teaching method in their practice, one that provided the opportunity to teach physical therapy content that could not be taught in other ways. In this emergent theme, the researcher noted consistency among the statements made by different participants. Specific examples for each participant demonstrate the universality of the teaching practice and the similarities in their thinking.

**Regarded as an acceptable teaching method.** All eight participants made statements supporting simulation as a teaching practice; these shared universal traits. Each participant used these five traits in his or her practice. These universal traits were: structured education through learning objectives, presence of debriefing, importance of fidelity, use of evidence, and outcome assessment. Given that all eight participants described similar experiences with their simulation education process, the researcher concluded that the information presented below illustrates that simulation education in physical therapist education has a consistent structured practice.

**Learning objectives.** When asked how a faculty member starts creating a simulation education experience, each participant relayed a similar message: their experience began like any other method of teaching, through establishing objectives for their students’ learning. Through discussions with all participants and most notably Donna, who taught many others how to teach with simulation, the researcher realized that learning objectives were the framework that guided the faculty member through teaching with simulation. Donna described it this way:

> We always go back to, all right, what are those learning objectives, what do we want them to achieve, so then, we start saying, well, when would that be the most naturally
occurring way for that to happen, so that it doesn’t look like it’s staged, so it’s as live and real as possible?

The researcher understood, through the participants’ explanations of their experiences, that the objectives of simulation were not in silo for the experience itself. Barbara had created simulations to meet her program’s need to “give them exposure to the acute care setting” and to have students “interested in the acute care setting” to prepare them for their acute care clinical placements. Connie used objectives to make sure a simulation “has a solid connection” with the course content.

The researcher established that each participant viewed the learning objectives as a structure for guiding decisions when writing and executing a simulation. This structure helped them determine how simulation achieved the learning objective. Anne used the objectives to “find a scenario that would include those skills or challenges.” In addition to the simulation design, the participants used the objectives in deciding whether to use a simulation exercise at all. Erin described how she decided if she should insert a simulation into her course:

I think for any activity or goal I want to accomplish in a course, I think about okay, what’s the best, what do I think is the best way to achieve that and when the answer’s simulation, then I start to go down that pathway.

Henry made decisions about whether a simulation would use a high fidelity manikin or a patient actor based on the objectives. He discussed how the “manikins are cool” but if the learning objective required the simulated patient to move, using a manikin was the wrong choice. Henry explained how he used a learning objective to make decisions regarding using a manikin in the creation of a simulation for his course:
If it’s simulation for PT students only, it might be, you know I want them to have a chance to assess vital sign response to activity, I want them to come to the decision to you know measure oxygen saturation activity or to measure a blood pressure upon standing, to get that value and then to make decisions accordingly, but it all comes down to sort of what’s a, what’s the primary learning point I want them to walk away with, and that’s where it starts.

Henry’s thought process illustrated his intentional use of simulation to meet a student outcome.

**Debriefing.** Debriefing occurs after a simulation exercise. This is when faculty lead students through a self-reflective process on their performance, and discuss the students thoughts that occurred within a simulation experience. All eight participants said debriefing was the main purpose of their simulation experiences. Connie referred to debriefing as “facilitating a good discussion” and asserted that debriefing is when the learning takes place:

A successful simulation is when the debriefing is, you know, students are noticing things they could have done better, students are able to identify things that they really liked that they did, that they can recognize that they have certain skills.

She further stated that the debrief allows you to understand a student’s performance:

You realize when you start to debrief, everyone has their strange reasons for why they do things, and that’s why I think the debriefing part is so important is because it lets the students explain what they were thinking while they were doing these things that sometimes are really not at all what you expect.

Barbara valued the debriefing process as an opportunity to “correct some mental models right away.” Barbara reported it took “twice the amount of time that they're actually in the simulation” and the researcher noted similar statements by the other seven participants. The
researcher understood that the time faculty devoted to debriefing emphasized its importance. In addition, debriefing was found to be required of faculty. For example, Henry debriefs with each session, otherwise his “simulation center gets pretty upset.” This guideline was in place to ensure that the learning that can occur with debriefing was not overlooked.

Available evidence. All eight participants used available evidence in simulation. The researcher understood through conversations with all the participants’ that literature on physical therapy and simulation is limited. In addition to limited literature, Henry noted there are no clinical guidelines for simulation. Clinical practice guidelines, often described in physical therapist practice as evidence-based guidelines, were found lacking by each participant. Despite the shortage of literature, each participant used what literature was available to enhance his or her simulation. This process was evident when Barbara discussed her need to rely on other disciplines’ evidence for her teaching practice: “I think the last time I counted there was maybe, it’s under 10 articles. So a lot of the disciplinary knowledge for PT is having been begged, borrowed, and stolen from other places.”

Participants appeared to base their decisions on how to execute their simulations on findings gleaned from the limited physical therapist literature combined with literature from other health professions. Gordon guided his debriefing practice by using scholarly literature. He discovered, “the best facilitator is going to be deep with content knowledge, as well as people with debriefing knowledge, because then they can give the reality of practice and debrief.” Therefore, he always has two faculty lead debriefing.

Anne spoke of using relevant physical therapist education documents and literature to align her simulation with the professional expectations her students would face upon graduation. She reported she “looked through everything clearly to say what are the skills, relative to acute
care, that our students need to be able to have.” Donna aligned her practice with the literature, but explained that she at times deviated from the literature. When she chose to further simulation practice by deviating from the literature, she examined that choice. Donna described her experience making this intentional choice:

The one thing I’ve really deviated from the literature is on group size. I think I mentioned it earlier. We run our simulations with 12, 14 learners sometimes, and most people keep it to what your typical group size is, six to seven. ….. Now, most people will tell you in simulation that a group beyond eight or nine is way too much, and I had thought I agreed with that until we increased our numbers so much and couldn’t run as many simulation sessions and we doubled our groups’ size to 15 and it’s been fine.

The researcher understood that the use of literature enhanced faculty’s experience and decisions regarding their simulation experiences. While faculty members did not always follow customary practices in the literature, they were aware of when literature may support or contradict their teaching process. In instances where they were in contradiction, participants acknowledged that they were deviating from current practice so their own teaching practice with simulation could evolve.

**Importance of fidelity.** Creating a simulation realistic enough that students believe they are in a health care setting was important to all participants. The researcher noted that while all aspects of the simulation must be realistic, the factor perceived as most important by the participants was the fidelity of the patient. Donna, Henry, and Connie explained how they have transitioned to using standardized patients more often than high fidelity manikins. Henry believed the manikin can detract from fidelity, believing it may “bring a whole new level of fidelity to interact with a real person rather than interact trying to be as, as genuinely interactive
with this manikin.” Anne, Barbara, Connie, Erin, Felicity, and Gordon used the manikin for the
benefit of “physiologic fidelity,” as Barbara describes:

The need for the high fidelity manikin is when we're getting into situations where we
really need that physiological fidelity. It's very hard to put a, have a patient simulate
going into V-tach, but our manikins can do it all day long and it doesn't hurt them.

Although Connie used both high and low fidelity, she emphasized that an important aspect of
fidelity was that students would be graduating to treat patients and not manikins:

I think using SP and doing it in a simulated environment that actually feels pretty real,
it’s a very different for them, it’s very different for them, and it’s funny because they’ll
even tell you, - like I know that was actor but they acted really well, and I was really
worried and I need to be more careful about these things or whatever it is, they think that
that feels more real to them, and I think that that helps them when they go into the clinic
and then later when they graduate.

Participants viewed the students’ belief in the realness of the patient they were treating as
essential to students’ learning with simulation.

Outcome assessment. Although participants were asked only how they viewed their
successful simulation experiences, and not directly asked if they performed an outcome
assessment, each participant described experiences with measuring outcomes of their teaching or
the desire to do so in the future. Some participants reported being at the beginning stages of the
outcome assessment process. Gordon said his program is looking to examine “how did the
simulation play into a larger scale preparation of the student” now that his first student cohort has
progressed through his program and on to their final clinical experiences. He is hoping to see
“what the impact of these are going to be in terms of their comfort with communicating.”
Connie reported that although she had years of simulation experiences, her focus on outcome measurement had not been present when she began because she “didn’t have time to think about it.” Years later, she is now “in the middle of gathering data” as part of her interprofessional simulation collaborations.

Henry said his simulation center is working on a “systematic measure of students’ outcomes across the center,” including those of his physical therapy students. Henry stated that despite his copious experience with simulation, he did not think the outcome assessments had provided what they needed to: “I’d still really have to really figure out if it's really worth it or whether we're better off spending that time and money just finding students the clinical experiences which are probably better than a simulation.”

Anne and Felicity shared a clear focus on measuring outcomes from their simulations. Anne summed up her focus with this brief statement: “Do I always measure an outcome? Not necessarily, but I try to.” Anne commented that the newness of the teaching modality limits the available outcomes, and provided evidence for their importance. Felicity had created a grading rubric for each simulation to “measure [students’] self-perception of their learning” and believed further outcome assessment was needed on simulation education across programs to establish it as a lasting teaching method. Felicity acknowledged the current limitations to outcome assessment: “We don’t know what the carry-over is; is it worth it, is there an impact on clinical performance based on having had the simulation, and people are trying to go back and measure that.” Felicity emphasized that more progress on outcome assessment is needed in physical therapist simulation education.

*Creates a different space to experience student learning.* This sub-ordinate theme describes how faculty perceive that using simulation provides opportunities to educate about
physical therapy content that could not be taught in other ways. Through conversations with the participants, the researcher determined that the participants’ experiences with simulation allowed them to provide an active and engaging teaching modality. This active modality was conducted with smaller student ratios and allowed student performance to be observed, which enhanced the faculty’s ability to guide students in a self-reflective process of learning. Examples of each of these are presented below.

*Active engagement.* Participants described simulation as “active learning” and an engaging teaching process where students could “make mistakes.” Simulation’s active learning was noted by the researcher as meeting the practical needs of teaching content that was not easily delivered by other methods. Erin gained great ability to see her students’ performance, because of the smaller student teacher ratios in a simulation. She said,

> the most obvious difference is you can do and accomplish a lot more with 4 people than you can with 70, and you can attempt like individual learning needs and learning styles a lot better with 4 people than 70 because I’m making, I’m trying to teach to the masses. So if I have 4 students in front of me, I can have a much different conversation than I can in a class of 70 because if I go to just the highest people in a class of 70, I’m going to lose 50 to 60 people in the room.

Barbara believed her ability to teach with this active method provided her the benefit of thinking and teaching differently than in standard lecture and laboratory didactic teaching. She reflected,

> I think that that’s our biggest, your biggest strength of having simulation, or being a simulation educator, is to be able to think differently, and to not just teach things the same old way, because that’s how they’ve always been taught, but to think about how we
can transform some educational principles, and how we can actually implement some things, and how we can change how students maybe you know approach the acute care setting and feel more confident when they go into the ICU, and change the way students perceive acute care practice, change the way students perceive you know just the areas, and the areas in which they practice.

Henry’s experience with simulation allowed him to teach a “more engaged learner.” Felicity found teaching with simulation “so much more valuable than lecturing to this generation” because of the active learning components that meet their needs. Felicity said this type of learning assisted her students who struggle. She has experiences with “underperforming students” in lecture who go into realistic simulations and “ace them.”

Simulation was commonly used to teach aspects of acute care physical therapy. Several participants observed that appropriate teaching of this content was missing prior to adding it to their teaching practice. Barbara used simulation to give her students access to acute care equipment such as “reading monitors,” which were absent due to not having an academic medical center. Prior to adding a specific simulation, “there was no way for [students] to get experience handling patients necessarily in [a hospital setting]” to prepare them for clinical practice. The addition of this simulation allowed Barbara to proactively see students perform in a hospital setting and work with students who had difficulty “with their advisor” prior to clinical placements.

Felicity had similar experiences and acknowledged that parts of physical therapist practice, such as manipulation of lines and tubes, were not adequately taught until simulation came along. She commented, “There’s no way to teach that from a lecture, right? You can show
people, you can show students lines, you can tell them about lines, it’s really actually about how they interact with lines.”

Although each participant experienced simulation as filling an unmet need, the researcher believes Connie best described the emotion behind this. Connie recalled the first time she recognized simulation was a potential answer to an unmet need in her teaching practice:

I had that initial oh my God, I have to get involved in this because I know you can, you know, teaching acute care without a center like that just becomes weird and ridiculous, like oh, let’s pretend a plank is a bed even though it’s not and you’re not going to understand how bedrails go up and down because I don’t have a bed to show you.

All participants viewed simulation as a means for faculty and students to observe student performance and make mistakes without causing patients harm. Connie remarked that the ability to make mistakes lowers stress for the faculty member and student, because a “real patient” is not at risk from a student’s performance. The researcher understood from the data that the ability to observe students’ affective, psychomotor, and cognitive performance allowed faculty to make more accurate assessments of students and address student learning needs in a short amount of time. For example, Gordon’s program required students to pass their simulation experience to “be safe” for clinical experiences. When he observed his students in simulation he reported that often he “gets to see his students shine a little bit,” however, sometimes he was able to identify students who need further instruction.

I’ve been able to just meet with a couple of students who struggled, to talk to them about, clearly this wasn’t a curricular problem because 58 of you did it great. This seems to be a student based problem and so what, what do you, what do we need and sometimes it’s
Faculty experienced students’ emotional reactions through simulation. The most common emotional reaction encountered was students’ expression of love of learning. Several participants remarked that students demonstrated their enjoyment from learning this way. Anne said an important part of a successful simulation was “smiles on their faces” when students left the simulation. This provided her with acknowledgement that her students have enjoyed their learning. Barbara and Erin noted they often received requests from students to “have more of these” experiences. Erin attributed some of the students’ desire to learn through simulation was because it “forces them to be in a real environment and I, I think adding that additional context of learning makes it easier for them to learn and make changes.” In addition, she perceived simulation as a method to challenge her students “in a different way” through placing them in real life situations to make decisions. Donna stated that simulation “is a great way to learn” and students and faculty can “see the result instantaneously.” Donna reported that her students love it, as seen in her teaching evaluations:

I still get teaching evals at the end of the semester for a course that I think I do a great job, and, and you know, and half the students think I did a fabulous job and the other half are going it was a waste of time, I mean, that happens all the time when you do classroom teaching. Now, when I teach in simulation, like I said, the most negative comment I’ve gotten is why don’t you give us some food during the night?

Participants discussed their experiences with oppositional or difficult student emotional reactions. Connie and Anne expressed self-awareness their responsibility when teaching evokes students’ emotional responses. Anne reported that her students are “nervous” and “she tries her
best to make them not nervous” but it is not something she can completely avoid. Connie said her responsibility for students’ emotional reactions goes beyond what she sees:

I think it’s important to recognize that they’re emotionally charged even if they don’t look emotionally charged to you as the educator, so you have to have a little bit of sensitivity in that this can be very emotional for students, and just to be cognizant of that because if that gets out of control it can kind of derail everything later I think.

Participants stated that the ability to facilitate student self-reflection through debriefing was something that did not occur at the same level in other parts of their teaching practice.

Anne described her role in simulation as working with students “to help them increase their ability to reflect and to increase their ability to learn the processes and procedures in a safe and controlled environment.” Henry emphasized that the reflection in debriefing was not his teaching as much as his ability to facilitate a student’s own process. Debriefing for him allowed him “to just get out of the way” of the student.

Felicity’s use of self-reflection within simulation increased student confidence. She had “seen students who didn’t have a whole lot of confidence in themselves and their abilities, realizing that they had more confidence and ability than they did.” Connie used video recordings of the students’ simulations to assist with reflection. In one instance a student’s observed performance in simulation helped her address a persistent learning need:

I had one student where that happened; she was “like I keep saying ‘like’ every third word what is wrong with me?” I mean, we had all noticed it about her and I think even her advisor had mentioned it to her at one point earlier, you know, in the program, it wasn’t until she saw herself on the video trying to talk to this patient, she’s “like wow, that’s just awful, I need to cut that out, I can’t be doing that anymore.”
**Student transformations.** Participants were asked if they have observed student transformations through their experience with this teaching method. While participants said they saw “increased confidence” and “increased preparedness,” even “leaps in learning,” only one participant felt confident the simulation experiences they had with their students were transformational. Donna, the most seasoned simulation educator, reported experiencing this transformation:

> By the end of the night it’s just amazing the change and how much they ask, how much they learn, how professional they are, how supportive they are, and that, that, my main objectives have been achieved and how that happened you know? Because every time you do it, it’s a little bit different, it’s never the same way but it’s amazing that you can achieve the same objectives.

She attributed this finding in part, to her four-hour debriefing method that provided a longer simulation experience for students. This allowed her to “see the learners get better even though the difficulty and the challenges is getting greater as well.” Other participants did not describe any observed transformation.

**Development of the teaching practice evolves through experience.** The researcher viewed participants’ experience with simulation as being influenced by life experience and ongoing use of the teaching methodology; this is the second superordinate them that emerged from this project. These influences developed faculty’s ability to teach with simulation and led to increasing expertise with the teaching method. Participants gained expertise through practice, which allowed for refinement of their teaching. The sub-ordinate theme *Influence of their other lived experience* captures participants’ thoughts on lived experiences that impacted their teaching. These included
experiences as a physical therapist in a clinical environment, as a faculty member, and
their own personal experiences and personality traits. The sub-ordinate theme
Advancement in expertise through ongoing simulation practice captures how
participants’ ongoing experience of using simulation enhanced their expertise.

**Influence of their other lived experience.** All eight participants were seen to have had
lived experiences that impacted their teaching. Initially, many participants based their simulation
teaching on prior clinical experiences. Faculty explained that when they began to add simulation
to their teaching practice, they created cases “off of their clinical practice.” These cases were
used to expose students to clinical scenarios that they likely were “going to see.” Barbara
credited the past and current clinical practice she had with keeping her simulations “fresh” and
current.” She reported that these experiences added depth to her simulation teaching. She also
related her need to “look things up in clinical practice” and “not knowing everything” in clinical
practice as enforcing behaviors she needed while teaching with simulation.

The professional role of the physical therapist in the acute care setting, where almost all
participants had worked, was believed by participants to assist them with the flexibility needed to
教 through simulation. Donna explained, “it’s just like working with your patients, you have
a plan and it never goes that way but, whatever ends up happening, it’s still a benefit to that
patient.”

The specific experiences participants had as physical therapists were understood by the
researcher to influence their choice of what content would be taught with simulation. One
distinct discussion point for several people was the question of whether physical therapist
students should participate in simulation experiences in which the manikin goes into cardiac
arrest. Anne made a conscious choice to avoid this type of simulation:
So my patients don’t code because we’re not, my goal isn’t to teach them how to respond to a code, because that’s not, I don’t think that’s necessarily an entry level skill that they have to have upon entering their clinical experience, but they need to do, and there’s so many more practical skills that they really need.

Connie made the same choice. She had “worked you know nearly 15 years at a hospital and I never had to hit a code button in my entire life,” so she felt having students participate in a code was “ridiculous.”

However, Felicity’s clinical experience of having a patient go into cardiac arrest during her physical therapy session was enough to convince her that all physical therapist students should experience it, even if other physical therapist simulation educators were “very critical of [her]”:

I worked in acute care and remember as a new grad, finding a patient coding and running from the room and not knowing what to do and feeling that sense of [sigh] I don’t know what the right word is, that sense of like incompetence I guess in that area, and I think my case kind of grew out of that.

Advancement in other areas of teaching was seen to contribute to the evolution of the participants’ teaching practice with simulation. The very act of teaching was itself seen by participants as contributing to their development. Connie said she now has “a lot more knowledge of teaching than I did when I first came out of the clinic,” which has advanced her ability to teach with simulation. Connie gained strength and confidence as a teacher through simulation. She believed that during her earlier years of teaching she “would not have been as forceful at times as I have been, I don’t know if I would have had the confidence.” Erin credited
her overall teaching experience with her starting to understand “what the students really need to know, and trying to figure out what’s the best way for them to understand that.”

Participants who have attained senior status and/or tenure within a university were seen to have more freedom to evolve their teaching practice. Felicity reflected:

I think it was probably at the point when I got tenure that I started to evolve, and that kind of happened at the same time I started doing simulation. So for me it just kind of lined up but, I would say it’s only been in the last couple years where I, two or three years where I’ve really been like, we’ve got to do this differently.

Life experience itself was seen to influence the participants’ experiences as simulation educators. Henry’s experience as a pilot provided him with knowledge of simulation from another context before he started with healthcare simulation. He viewed his “requirements for safety” in student learning and “using checklists” with simulation as a direct result of his training:

I’m also a pilot so you know a, from a background in simulation standpoint, I mean simulation, you know setting yourself up for you know specific problems and scenarios and seeing ideal in the debriefing of them, you know that’s kind of [inaudible] so I feel I kind of brought probably that mindset to simulation in healthcare as well.

**Advancement in expertise through ongoing simulation practice.** Ongoing experience with simulation through training and using simulations was seen to advance participants’ expertise. Six of the eight participants had formal training in simulation. Anne and Erin each took simulation courses before they started teaching with it. Anne felt “very fortunate when I started out” because the training gave her a “very structured way of writing scenarios that I follow,” which she continues to use. Mentorship assisted with participant advancement. Gordon
was assisted by another physical therapist faculty member with “the debriefing, a little bit with the mentoring, a lot with how to design the cases.” These mentoring and training experiences were seen to enrich the faculty’s ability to use simulation.

With ongoing experience, participants were able to use “the same cases multiple times.” The simulations could be modified and thus did not require as much time as they initially did. The ability to repeat simulations was seen to foster “reflection” and “modifications” to the participants’ teaching practice. These reflections led to the faculty “developing and always reconstructing our scenarios to get the learning objectives better met for our students.” Repetitive use of simulation was found to decreased faculty’s “anxiety” and “nervousness” with teaching. Participants said that overall they were able to be more flexible, which helped their teaching.

Participants used terms such as “novice,” “becoming an expert,” “advanced,” or “somewhat in the middle” when describing their own level of expertise. While each participant had spent a different amount of time as a faculty member and as a simulation educator, the three participants with the greatest amount of overall experience were seen by the researcher to separate themselves in the advancement of simulation practice. Each of these three faculty demonstrated creativity with their simulation education beyond the other participants.

Connie transitioned to a delayed debriefing model with her simulations, which occurred with students at the end of their academic coursework. With this model, her students reflect for a longer time period and then work through debriefing at a later time. Although Connie’s delay in debriefing deviated from the literature, Connie believed the delay in debriefing allowed students to self-reflect for a longer period of time. Connie thought this was more comparable to how they would receive feedback in a clinical environment from a clinical instructor, and believed
preparing students for this warranted the break with common practice. She described how she explains this creative process to her students:

We’re doing this on purpose because you guys are getting farther along in school and you’re not always going to have your clinical instructor right there and you’re going to have to learn how to hold on to that self-reflection and wait until you have an access to somebody else to maybe talk about it, so we’re kind of trying to do this thing where we’re delaying that because that’s what happens a lot in clinical practice and when they become interns and you know, basically when they get their job you don’t always have somebody who’s right there the second you’re done doing something where you can debrief with that person.

Henry ran “eight simulations at a time.” He credited his repetition in simulation as allowing him to debrief without observing everything the students do. Over time he learned what will likely happen and has put observers in place to fill in any gaps:

Yeah, I can watch several at the same time and if I want to listen in, I have to pick one and listen in on, but at least I can sort of scan and say oh, now they’re about to get out of bed, let me go see how that sequence goes for that room and then I’ll back out and flip around so.

Donna worked to develop prolonged standardized patient examinations that she would like to see be part of licensure for physical therapists in the future. Connie, Donna, and Henry each talked about having ongoing simulations that mimic the real life scenario where students see several patients in a row. Donna was currently doing this with her students and seeing positive results:
I’ve got these scenarios where maybe they’re in an inpatient first, then they go to outpatient, or maybe they’re in outpatient first and then they go to inpatient and then they go to home care, and so if they don’t actively work those other settings, they don’t know what the patient went through before or what they’re expecting later, so a lot of the professionals really express that they love to see where the patient was before and where they’re going and we actually have one, one curriculum where they actually meet the patient later after their last homecare visit to see what’s changed in their life for the positive and the negative, because we just have this short window sometimes with patients in our own little setting and so to really see the perspective of what’s going to happen with them in the community and how things can be impacted upon what we do.

The creativity Connie, Donna, and Henry 8 have brought to simulation defines their expertise and experience to the researcher.

**Presence of academic constraints.** This super-ordinate theme describes the influence academic structure and culture has had on the participants’ simulation teaching practice. Through data analysis the researcher understood that the teaching practice of simulation education in physical therapy is influenced by limitations or accelerations from participants’ academic institutions. These influences were present in two sub-ordinate themes. The first, *Limited by practicality*, captures the participants’ experiences with their teaching practice being limited by their academic institution’s structure. The second sub-ordinate theme, *Influenced by academic support*, captures how the researcher found the participants’ teaching practice was influenced by support or lack of support from their academic program, college and/or fellow faculty.
Limited by practicality. The researcher understood that participants’ use of simulation in their teaching practice is affected by the practical constraints on teaching in higher education.

Each of the eight participants provided statements to support how their decisions about executing their simulations took into account academic schedules, faculty workloads, and student considerations. In some instances, practical constraints were seen to limit faculty from progressing further with their simulation agenda, or the simulation agenda of their respective programs, often due to simulation being only a portion of their teaching load.

Participants acknowledged that simulation required a larger investment of time to plan and execute than a traditional lecture or laboratory teaching. Anne balanced her simulation teaching with her other responsibilities in clinical education. She used simulation to “prepare them for clinical education,” but needed to also leave herself time for her administrative and advising responsibilities. She expressed a desire to see simulation in her program extend beyond the acute care simulations she did with students. She stated she could see herself in “a role as a simulation facilitator” where she could add simulation alongside others’ courses in conjunction with the course faculty, if her teaching load had the time. However, she was unable to meet this need; this was a struggle for her:

The question is, that class is three hours, it’s going to take me 30 hours of work to get that three hours and that’s a question of, is it valuable, you know, do I get paid for my time, not paid for time? How does my workload get accounted for? Is it considered service? Is it considered administration, like I feel like you have to think of all of these things unfortunately, but I feel like that would be a really cool direction to go, and I would like to, to see it be outside the acute care world
Erin had to consider logistics with her simulation planning because she was the sole faculty for her course content and her students have busy schedules. She reported that students in her program are in class “somewhere between 8 to 5, 8 to 6 everyday” and scheduling outside of class was not an easy option. She was required to make sure simulation occurs within her scheduled course hours, which she referred to as a “herculean effort.” She met this requirement through planning and coordination and having students participate in simulations in small groups, thus limiting the number of times a simulation needed to run. She described this effort as present from the start of executing a course simulation:

Yeah, so that’s one of the big things that limits me or I have to think about when I’m doing any sort of simulation is that I teach the classes by myself, so the logistics and the planning and most of the simulation and debriefing falls on me. So, unfortunately when I’m thinking about simulation that actually is one of the things at the forefront of my mind that makes me think about, is it really the best modality to use to achieve the certain learning objectives?

Connie considered herself an “anal time keeper,” which allowed her to keep up with the logistical time constraints on simulation. Her years of experience with simulation and in academia allowed her to face the academic challenges in a practical way. For example, she was aware of her limitations. She planned her simulations “really far in advance” to ensure the faculty and support resources she needed would be available. Her students participated in simulations in pairs because she did not “have that kind of time” and she “can’t block out a whole week to get, you know, 37 hour long simulations done.” She acknowledged that long individual simulations were not the purpose, and that her concessions to academic constraints still met the students’ needs. Participating in pairs “decreases the anxiety [for them] a little bit as
well as saves on time.” She was realistic in her explanation of what she could do within her teaching practice:

They’re not doing a whole 45-minute treatment that isn’t the purpose, you have to pick the one thing that you want them to do and then it’s maybe 10-15 minutes and that’s it so that you have enough time for the debrief because God, if you did 45 minutes, you’d have to be debriefing for hours and with 30-something students you’d never leave,

Gordon conducted his physical therapist simulations using interprofessional practice with nursing; these were limited by the ability of his and nursing’s schedules to meet. Anne, who expressed plans to start coordinating with nursing, reported that she previously had not had the time and resources to start this coordination process. Felicity said she was fortunate to have a large simulation center with support staff, which allowed her to focus on running and planning the simulations with her students and leave set-up to others; however, logistics were still a large hurdle for her. Felicity’s interprofessional simulations with nursing required her to coordinate two program’s schedules. The time commitment was intense in that she needed to run “130 nursing students, you have to get through simulation with 50 PT students, and you’ve got to do it all in three days.” Felicity accepted this time commitment as part of her simulation teaching practice, and although it is stressful, she was happy to continue it:

My husband’s like, you’re crazy, because it’s like 20 hours, like it’s almost like a half a semester teaching in 3 days, but I’m, I never, I never dread it, I never don’t look forward to it, I’m never bitter about the hours or the time because it’s so valuable as far as the outcomes I see from the students.

Donna designed her simulations to occur in the evenings, outside class time, to avoid academic time constraints. Typically, she was “running simulations three evenings a week for
four hours a night, so 12 hours” of simulation. This evening commitment worked for her in her teaching practice. Henry had been doing simulations for several years and admitted he has learned to be flexible like “Gumby” because everything is subject to change when you are coordinating a simulation. He averaged “90-120 hours” each year on simulation education, which was only a portion of how he taught his students. His program supported students attending simulations “outside of class time to do them” which eased some of the logistical constraints. He knew that higher education did not allow “all the time in the world to do simulation.” However, even as flexible as he was with running his simulations within academic constraints, he believed logistics was the hardest part of using simulation and it took a great amount of his “mental time” during his teaching practice:

So whether that be last minute student changes in schedule, this past winter we had a simulation and the night before is going to be a snowstorm, how many of those [standardized patients] were going to make it and if one of the [standardized patients] doesn’t make it, what’s the backup plan? How are we going to shuffle it to make it work? But yeah I’d say the bulk of it is logistics.

**Influenced by academic support.** The researcher viewed the participants as practicing in a culture with varying amounts of support from their faculty, programs and colleges. The researcher defines support broadly, to encompass positive reinforcement, resources, grant funding, and program structure. Participants who had a structure in place that supported simulation beyond only the physical therapist curriculum were seen by the researcher to more extensively use simulation in their teaching practice. Those participants who were understood by the researcher to be the sole engaged faculty member were more likely to face limitations on
their use of simulation. Each participant had positive support for his or her teaching practice, but the type of support, and from whom, had an effect.

The participants who had experiences with large simulation agendas, with multiple interprofessional simulations, and with more than one faculty member devoted to physical therapist education progressed beyond the other participants. This progress was facilitated by top-down support that went beyond favoring simulation as part of faculty workload. Connie, Donna, and Henry had simulation agendas that benefited from this. Connie and Henry had similar entry points into simulation. Each of them had an existing simulation center supported by the mission of their program or college, which was looking for physical therapy faculty to get involved. Although Connie’s path was distinctly different than Henry’s, the researcher believed their welcome into an existing center was an important aspect of their current experience. Neither Connie nor Henry needed to “turn on a manikin” or set up a room, thus they could focus on the pedagogical aspects of learning with simulation. Connie described how the start of simulation was about looking at how this modality would benefit physical therapist education as it had medicine and nursing:

So our institution, because we have a nurse anesthetist program, hey we’re kind of the spearhead group on campus that really got our first simulation center up and running. They got a lot of grants through a bunch of nursing organizations to get that up and going, and at first when you were doing it, it was very much just targeted towards them in nursing, but once they got to a point where they could build out a certain amount of space on campus, they were making it clear that they wanted other programs to be involved. Henry’s simulation center reported directly to his university’s leadership, which allocated budget support and fostered simulation as part of the program’s mission. Henry’s program grew
in size since he started, but even in its initial phase he had two people devoted to simulation operations. He started alongside a faculty member from the physician assistant program and a simulation operations staff member; they learned collectively how to incorporate simulation. They “really kind of have just evolved together, just by trial and error, I guess.” Now his program has extensive support from more than five full time staff.

Donna was at her second institution, where she is responsible for creating structure that benefits others’ teaching practice. At her current institution she built a program with “35 faculty” who use simulation in their teaching practice. This process was implemented over a year and a half primarily due to a college dean making the program a priority:

He funded myself and three other, four other faculty members from different disciplines to go to the international institute on interprofessional education in Washington, that they have every year and we went there, and from there it just started growing, we started developing our interprofessional simulation program, we secured several grants that funded us to equip a small simulation center in one of our existing buildings, we recruited faculty, we developed faculty, we held retreats, we trained, and we went from a team of five of us to a team of 30 in about a year and a half.

Donna’s workload and research agenda had a focus on simulation, in contrast to several other faculty who used simulation in their teaching. This support allowed her to develop her interprofessional program. Donna acknowledged that this was a “huge opportunity” and expressed fear that if administration changes her teaching practice may also change:

“Sometimes have a little bit of a fear that if the new administration comes in and isn’t as excited about simulation as we have been in interprofessional education, that this could all just go away.”
Other participants were seen to have a requirement of increased support. Anne and Erin had support from their program in regards to the need and importance of simulation, but did not have a large simulation center structure in place. Their practice was limited by their own time. Anne expressed a sense of nervousness about this:

I feel like I’m jealous when I meet people who talk about … their programs. That there’s you know a group of people within their department working on it and I wonder well if I was to leave my institution and somebody else were to take my job, would the simulation program continue, or would somebody take my courses in another way, which they have the right to do but, right? So I think it’s hard to feel like it’s your program versus your department’s program.

For Erin, the inability to extend simulation beyond her own teaching practice and further within her curriculum was a source of frustration:

I get really frustrated that there’s really good evidence across health professions and for simulation as a teaching modality. We have the infrastructure essentially to be able to do it, but not to get any support, and literally to be told by my chair or dean, well we just need to operate, you know you can’t be doing more, you’re doing too much and like to get literally no support from them for that, where one thing [inaudible] on the cutting edge of teaching and learning, but at the same time don’t give support for it, and especially the more and more I read I engage in my doctoral studies that I, I, it’s very frustrating to me.

Connie, Felicity, and Gordon had varying levels of support. Felicity had a large simulation center and technology support, but continued to be the primary faculty within her
program running simulation. However, her faculty support allowed her to extend her simulation to interprofessional teaching:

There’s never been any talk about, I have, I have other faculty who literally move classes and cancel classes, so I can do the inter-professional sims. So it’s become more of a priority for our program, to make sure it’s happening than anything else.

Despite program support, the progress of simulation education within Felicity’s program stopped when her teaching practice could no longer accommodate it:

I could, I just haven’t. I just think I’m so overwhelmed with the work I have to do to kind of keep things with my responsibilities afloat, and if somebody else wants to come on, and say I want to try this, I’m way willing to help them but I’m not in a position where I can be the person to kind of start that across the curriculum right now.

Barbara had the support of her administration and several faculty, which allowed her to run several simulations within multiple courses, but she did not have a simulation staff to assist her. She remained the “make it work girl,” which required extensive time and effort. Gordon had simulation as part of his “job requirement” and was supported through his program, but simulation was not his primary responsibility. Simulation education did not extend beyond the two simulations he and another faculty member conducted.

**Interconnectedness of simulation and interprofessional education.** This superordinate theme captures the physical therapist faculty participants’ discussion about the relationship between interprofessional education and simulation education. Although interprofessional education was not a requirement for participation in this study, and was not a specific topic in the interview questions, data demonstrated that each participant had used simulation for interprofessional education. Interprofessional education was found to be part of
the simulation teaching practice for participants, not separate from it. Participants described this overall interconnectedness as a focus of their simulation experience in two ways. Sub-ordinate theme *Fulfills interprofessional requirements of teaching* identifies the participants’ focus on simulation as an appropriate teaching method for the required interprofessional education content in physical therapist education. The second sub-ordinate theme, *Importance of interprofessional collaboration*, captures the participants’ focus on how this interprofessional collaboration matters.

**Fulfills interprofessional requirements of teaching.** Participants’ experiences illustrated that simulation is a curricular method used to provide physical therapy interprofessional education and to educate physical therapist students on interprofessional practice. They described simulation as a method to allow students to engage with other healthcare team members, practice in a realistic setting as part of an interprofessional team, and become educated about how and why they should be an interprofessional team member. The faculty’s experiences with interprofessional simulations followed the same universal methodology identified in super-ordinate theme one, but with an additional emphasis on interprofessional practice rather than physical therapist practice in silo. The data suggested that although in silo simulations are used frequently, participants viewed interprofessional simulations as having a higher level of fidelity. Felicity said that interprofessional simulation experiences met her desire for her students “when they become professional, to be a part of the medical team, to feel like they can advocate for their patients.” Gordon stated that interprofessional simulation was a rewarding part of his simulation education experiences:

> I also like that I’m getting to be involved in preparing them for some of the realities of healthcare in shaping the learning experiences that are going to get them ready to
function in the interdisciplinary world, or interprofessional world that is, is healthcare.

So, I think that’s probably the most rewarding aspect of it.

Several participants ran simulations with students from other health professions along with their physical therapist students. Barbara conducted an interprofessional neurological case based simulation between occupational therapy, physical therapy and nursing on patient care coordination. Felicity and Gordon ran simulations with nursing and physical therapy focused on team communication. Gordon commented that the objective of his interprofessional simulation experience was communication between the two professions:

So we’re really trying to get at that first one of the nurse, the interprofessional communication, and so if that takes forever to get through, we will stop the simulation without very much patient interaction at all, so that we can have time to debrief.

The researcher found that participants achieved interprofessional simulation through different creative methods. Anne used interprofessional simulation to prepare her students for the clinical environment, “through working in the interprofessional environment” prior to clinical. In her interprofessional simulation, she used actors to “play” the role of other health professions as she did not have the ability to use actual students. She said she plans to add other disciplines in the near future.

The three participants with the most simulation experience provided deeper examples of their students’ ability to act in an interprofessional team. Connie noted her focus on interprofessional simulation was driven by her desire to protect the realistic role of the physical therapist within the simulation. She stated she “fears other people writing these scenarios for PT’s that are not PT appropriate.” Connie described this process:
That’s why I’ve stepped up to do it because I don’t want our students going through something that’s totally not appropriate to PT, so they need to have someone in that group, me who’s going to be a loud-mouth basically, and be like no, that’s not appropriate…. It’s like it is in the hospital, it’s very much an interprofessional team and if you’re not going to step up and make your point, people might walk all over you.

Donna had run almost exclusively interprofessional simulations in her practice. These occurred with “eight different healthcare professionals running simulations together.” Her focus was not only on having several health professions involved, but on creating time during debriefing to discuss interprofessional roles and misconceptions:

So I make sure that we try to have that come up in the debriefing about what more you do in your profession, what other kind of settings do you work in, how does that differ if you’re at an outpatient site, versus an inpatient, that kind of thing.

Henry discussed the challenges he had with having his physical therapist students participate in interprofessional interaction within a short amount of time. He had students pre-plan their actions and provided students with some portions of their examination in advance so their participation could be realistic and beneficial. He described this process with a recent simulation:

We just a did a large interprofessional simulation with the medical school and pharmacy program and the nursing program, and the PT role in that case is to go in and assess the patient’s mobility and their balance, and then contribute to the discussion of discharge planning about fall risk on this patient who’s on Coumadin and you know work that out with the rest of the team. They don’t have time to do the full, normal exam, right?
These examples demonstrate experiences the participants had with interprofessional simulation.

**Importance of interprofessional collaboration.** This sub-ordinate theme describes the process participants undergo to work collaboratively with other health profession faculty as part of their experience with simulation. The type and method of collaboration was not found to be uniform by the researcher, as it occurred in different ways. However, the collaboration was always done for the purpose of fostering interprofessional practice. This collaboration was found to take place during their own simulation training, while running simulations with students, and when mentoring other professions on the use of simulation.

Anne’s experience with interprofessional collaboration was through interprofessional faculty training. Her experiences allowed her to describe the role of the physical therapist to other professions:

> You know it was really great. I found that everybody was open to learning about what we did and it was a nice opportunity to explain to them what we did. I mean they were surprised to know that we would take vital signs upon getting a patient out of bed. You know they looked at us like, you do that? And I said yes, we do, right? So I don’t think it was difficult, it was really just a really nice experience and it was eye-opening for me to realize that they didn’t know about us; I just assumed that they did.

Gordon’s, Felicity’s, and Erin’s experiences were primarily in collaboration with nursing faculty. Erin created an interprofessional standardized patient program with a nurse practitioner. Felicity’s experiences collaborating with nursing allowed her to educate her students on the role of nursing in a more realistic way:
Not being familiar with nursing, it’s hard for me to kind of come up with [what nurses do], it really requires buy-in from the nursing faculty to kind of create that, and that’s where we are this year is we’re going to try and create that, and because I think we didn’t have the nursing teaching the PT students, the nurses actually didn’t measure as meaningful of a change in our objective measures as far as their perceptions as the PT students did.

Barbara described how she often collaborates with interprofessional faculty as a mentor:

So I will sit down with the course instructor and work on simulation pedagogy in the sim, and kind of fill in, here’s what the simulator’s able to do for you, here’s what physiology we can accurately portray, and so I work really closely with the instructor of the course or with our colleagues from occupational therapy, their instructors of the course or with nursing, and really sit down with them and say, we really have deep conversations about what we’re trying to accomplish and also looking to ensure that it fits course objectives.

Connie had experiences collaborating with an interprofessional simulation group and found that using the ground rules of interprofessional practice in the clinical setting has promoted the collaborative process:

The good thing about that IPE group is since we’re teaching an IPE class using IPE faculty, we’re very cognizant of, we need to follow the same rules that we’re trying to get the students to understand how to follow.

Donna was “the head honcho over all interprofessional” activities at her college. Part of her work involved bringing the physical therapist interprofessional role to the table which “primarily, has been medicine and nursing.” She observed that she has seen an increase in physical therapist presence at interprofessional conferences she has attended, stating that prior to
three years ago she was often presenting “in a room of physicians and nurses.” She believes her interprofessional simulation experiences have “been huge” for her understanding of other professions and led to a better appreciation of being a team player.

Transforming influence on their lived experiences. This super-ordinate theme describes the influence teaching with simulation has had on participants’ personal and professional lives. The researcher asked participants if having simulation in their teaching practice has influenced or changed other aspects of their professional career and personal growth. The participants shared the various ways that teaching with simulation had transformed them. While the researcher views some of the transformations as more significant than others, evidence of the influence on each participant’s transformation is presented below.

Anne and Donna revealed that simulation created a new state of joy within their teaching practice. Anne gained great enjoyment and fulfillment in teaching that “keeps me really excited about what I do”. She believed simulation allowed her to be “not bored by my work, ever.” Donna stated that teaching with simulation was “something I really enjoy” and has “really been a positive experience.” Her experiences helped her evolve from a teacher who does simulation to a simulation educator:

I’d much rather do simulation than anything else. I’ve always loved teaching but I never really knew if the students were getting it that didn’t ask questions or if I didn’t probe but somehow in simulation, it’s easier to probe and it’s easier to get people actively learning and involved, so I find that I can be more effective in a simulation, or feel like I’m more effective.

Henry’s view of his students was transformed through simulation education. He described how simulation led to his accepting that his students were adult learners:
I mean this is probably true for me as an educator in general, but certainly applies to simulation, and that’s a greater faith in the adult learner, and that is trusting that if I set up the learning opportunity correctly, that as a highly selected group of adult learners, that you give them the right setting, the right fodder for learning, they’re going to make the effort to do the amount of reflection and learning on their own.

Erin transformed her teaching ability through using simulation. She became more effective at “leading classroom discussion” which she believed “had had a much bigger impact on me as a teacher, and being an effective teacher.” This transformation shifted her thought process:

I think it’s also a shift in my understanding and probably some of this is experience and some of it’s probably doing a lot more reading with my Ed.D., and understanding education and teaching a little bit more, but really making a shift of, in the classroom, when I think about the first class I ever taught, I was lecturing the entire time and just downloading information. Now I spend the majority of my time in the classroom working on synthesis and evaluation and integration of information, and I don’t get as concerned about they have to know this knowledge.

Beyond her teaching transformation, Erin believed her experience with simulation education led to a shift in how she interacted with and thought about other people:

I’m approaching things with any students or in conversations with other people, just thinking about okay, so really trying to get down where are they, and if I can do that then we can see where we’re on the same page or you know figure out what the, you know the difference the discrepancy is, but I’ve kind of taken that approach as I interact with other people as well, and I feel like that’s been tremendously helpful.
Felicity credited simulation education with “giving her a sense of self-worth.” Her expertise within simulation led her to “gain a large amount of notoriety” on the national level, “receive a national award” and be “nominated for a teaching award” at her own institution. Felicity’s participation in this study assisted her with this discovery. Through discussing her experiences with the researcher, Felicity gained insight into her accomplishments in a way that she had not been previously able to reflect on: “I think one of the biggest light bulbs was not realizing until we had talked how much I had kind of accomplished with everything.”

Connie shared that she had a personal transformation in her thought process. She noted she became “a little more able to stop and slow down than I sometimes was before, because I’m a little, I think I’m, I’m a little bit better at reflecting in the moment” through her experience with simulation. Donna transformed her clinical practice and her personal communication through her simulation experience:

Yeah, yeah. More patient centered care, not being as directed, giving people choices, being a better listener to patients, I think it’s because, you know when you debrief you got to shut up, you got to listen, you got to get people talking, that’s been really good, yeah, understanding that there’s no right way

Gordon asserted that his simulation teaching has increased “how organized he needs to be” which has “filtered more though his life”. He thinks even his communication with his children may be influenced by his simulation education:

I mean I’m also a parent, and so like I wonder if it’s changed the way I help my kids, like do I do some, and I probably drive them crazy because I probably do, so I probably do some of those same things at home with my children, when we’re talking about things as compared to just getting information. So, I’m sure it has.
In addition to the above transformations, all eight participants noted that they had advanced their practice through written or presented scholarship related to simulation education, and all participants are working on some aspect of simulation research.

**Summary of Findings**

The purpose of this study was to understand how individual physical therapist faculty members perceived their experiences with using simulation education within their teaching practice. The data obtained through this interpretive analysis allowed the researcher to understand the lived experiences of eight physical therapist faculty who use simulation in their teaching practice. Eight participants with a range of three to nineteen years of using simulations shared their individual experiences. These individuals demonstrated unique paths to becoming simulation educators with varying levels of training and experience. Participants were understood to have developed their simulation practice through their experiences, which included a focus on interprofessional practice.

Through an examination of themes across participants identified five super-ordinate themes emerged. These major themes emphasized that physical therapist faculty teach with simulation using a standardized process that allows faculty to teach content that would not otherwise be taught effectively. The teaching practice is influenced by academic constraints and the participants’ lived experiences. The physical therapist faculty experience included interprofessional education, and simulation was a relied upon method to teach interprofessional practice. Each of the eight participants experienced transformations that were influenced in part, by their practice with simulation education.
Chapter five will discuss these key findings, explore the research findings through the lens of transformative learning theory, and provide implications for practice and recommendations for future research.
Chapter V: Discussion of the Research Findings

The purpose of this study was to understand how physical therapist faculty members made sense of their experiences using simulation education in their teaching practice. An interpretive analysis approach was used to permit multiple shared conversations between each participant and the researcher. Eight physical therapist faculty members from across the United States who had experience using simulation in their teaching practice participated in this study.

Data analysis was used to understand the eight participants’ individual experiences with simulation and discover themes across participants. The researcher uncovered five super-ordinate themes and eight sub-ordinate themes shared by all participants. These five super-ordinate themes and respective sub-ordinate themes were: (a) Belief in a unique teaching methodology, with sub-ordinate themes Regarded as an acceptable teaching method and Creates a different space to experience student learning; (b) Development of the teaching practice evolves through experience, with sub-ordinate themes Influence of their other lived experience and Advancement in expertise through ongoing simulation practice; (c) Presence of academic constraints, with sub-ordinate themes Limited by practicality and Influenced by academic support; (d) Interconnectedness of simulation and interprofessional education, with sub-ordinate themes Fulfills interprofessional requirements of teaching and Importance of interprofessional collaboration; and (e) Transforming their lived experiences. Each of these themes helped answer the research question and provided unique insight into understanding physical therapist faculty experiences using simulation in their teaching practice.

Transformative learning theory was the theoretical framework applied to this study (Mezirow, 1991). Transformative learning theory guided the study design, interview questions, data analysis, and the researcher’s interpretation of findings. This framework was chosen for
two reasons. First, the practice of simulation education has been examined and understood using transformative learning theory, and use of this framework provided the researcher with context for the methodology participants were using in their teaching (Clapper, 2010; Parker & Myrick, 2010; Rutherford-Hemming, 2012). Second, transformative learning theory helped the researcher understand how participants made sense of their experiences using this method of teaching in their practice and the problem solving associated with its use. Transformative learning theory posits that how learners interpret and understand their experience can explain their actions (Mezirow, 1991). Figure 3 illustrates how people problem solve understanding their experiences with transformative learning theory.
The following section discusses the research findings of this study. First, the key findings of the study, the super-ordinate themes, are presented in relation to the literature. Then, these findings are examined in relation to transformative learning theory. Following this examination, implications for practice and suggestions for future research are provided.
Summary of Findings

The findings of this study provide the physical therapist education community an understanding that while each physical therapist faculty member’s simulation experience is unique, several experiences are common among them. These shared experiences yield the following key findings:

- A unique and consistent process. Physical therapist faculty follow a structured process grounded in the literature and guided by goals and objectives, similar to other health professions. Faculty acknowledge that teaching with simulation requires an understanding of both simulation methodology and the circumstances of physical therapist practice.

- Evolution of practice. Experience as an educator, experience using simulation, and life experience all contribute to the individual development of expertise with physical therapist simulation education.

- Academic support. Participants’ level of support within their respective academic culture influenced their experience.

- Interconnectedness with interprofessional education. Physical therapist faculty who teach with simulation take part in interprofessional collaboration and interprofessional education as part of being a simulation educator. This process is beneficial to the faculty and their students’ learning.

- Impact on transformation. Each of the participants provided evidence that the experience of teaching with simulation has transformed their lived experience in some way. Participants were found to experience sustained changes in their personal
and/or professional lives which were found at least in part to be from their experience using simulation education in their teaching practice.

These key findings expressed in the superordinate themes are discussed in relation to the literature below.

**Findings in Relation to the Literature**

**Belief in a unique teaching methodology.** Medical simulation is an educational method in which students learn through performing tasks and making decisions in complex dynamic environments, using patient actors or artificial patients to avoid patient harm (Fanning & Gaba, 2008). The foundation of medical simulation is debriefing, where students reflect on their thoughts and actions in order to achieve higher-level thinking (Mariani et al., 2014). Successful student outcomes with simulation in medicine have led to its expansion into other healthcare fields, including nursing, social work, and physical therapy (Forneris et al., 2015; Nimmagadda & Murphy, 2014; N. Smith et al., 2012). As the practice of simulation education expands in physical therapist education, this study sought to understand how physical therapist faculty made sense of using simulation education in their teaching practice. Key findings from this study demonstrated that participants regarded simulation as a separate teaching modality that provided them an opportunity to teach physical therapy curricula that was not easily taught through more traditional teaching methods.

This first theme, which includes sub-ordinate themes *Regarded as an acceptable teaching Method* and *Creates a different space to experience student learning*, provided a deeper understanding of the acceptance and use of simulation in physical therapist educational practice. The data that emerged from this study demonstrated that the participants’ use of simulation in their teaching followed a universal but flexible practice. Each of the participants was noted to
consistently follow a similar and often identical process for teaching with simulation. This process included universal components of learning objectives, facilitation through debriefing, assuring fidelity, reliance on evidence, and outcome assessment. Similar results have been found in studies of success with simulation in medicine and nursing (Cant & Cooper, 2010; McGaghie, Issenberg, Petrusa, & Scalese, 2006). Participants reported they relied on literature from medicine and nursing to inform their simulation practice. This literature provided the participants context due to limitations in available literature specific to their profession.

Each participant followed his or her own method of best practice using intentional preparation and clear objectives, which have been previously noted as important in simulation education (Lyons et al., 2015). The learning objectives and clinical scenarios used by participants in physical therapist education aligned with core documents of the profession. However, participants said they were not using and not aware of any specific physical therapist guidelines for simulation education practice. Analysis of the data determined faculty do not understand their use of simulation in physical therapy to be a standardized practice and they believe current standard practice guidelines for physical therapist education do not exist. This contrasts with medical and nursing education, where literature provides their faculty more structure and potential standards for practice. (Meakim et al., 2013; Motola, Devine, Chung, Sullivan, & Issenberg, 2013).

Each participant emphasized a commitment to debriefing with simulation and the importance of good debriefing for student learning. In simulation literature, debriefing is understood as the primary focus, as it facilitates students’ self-reflection on their thoughts and actions so they acquire new learning and avoid future mistakes (Dieckmann et al., 2009; Dreifuerst, 2009). Participants in this study stated that their debriefing practices often followed
the evidence-based best practice recommendations for debriefing. In addition, participants were aware of the limitations of the literature when they diverged from best practice recommendations to attempt a novel approach to debriefing.

Participants used simulation for teaching content that was not easily taught through other methods. Specifically, acute care topics such as vital sign monitoring and line and tube management, as well as interprofessional teamwork, were common curricula the participants taught through simulation. Previous studies in physical therapy simulation education have involved aspects of acute care practice (Ohtake et al., 2013; Silberman et al., 2013). More recently Mori et al. (2015) have determined that students favored simulation experiences in acute care and intensive care units were favored by students, as they increased confidence and decreased anxiety. Participants viewed the use of simulation education as an active learning method that allowed for smaller student ratios and observations of student performance; these created a positive learning environment for students. Active learning has been cited in the literature as valuable and preferred by students (Lumpkin, Achen, & Dodd, 2015).

While many uses of simulation education were similar to other professions, such as vital sign monitoring and interprofessional communication, the data in this study illustrated a unique consideration for physical therapy: fidelity. The focus on maintaining a realistic clinical environment for students often led participants to avoid use of high fidelity manikins, relying on patient actors and standardized patients. The participants’ choice to use a patient over a manikin ensures functional fidelity when the focus is on the student functioning in a realistic environment (Hamstra, Brydges, Hatala, Zendejas, & Cook, 2014). The vision statement of the American Physical Therapy Association (APTA) is “Transforming society by optimizing movement to improve the human experience” (APTA, 2016). Placing students in clinical situations with
manikins that could not move their legs or walk was seen as unrealistic by participants and often avoided. Participants preferred using standardized patients to mimic a real world setting. In medicine and nursing, the focus is often on the patient’s medical condition rather than movement, and participants said they understood why the manikin was used more often in those professions. Despite the limited use of high fidelity technology, participants strongly defined their use of real life patients or actors as simulation. None of the participants asserted that they viewed use of one over the other as superior, only that fidelity was the primary reason for this choice.

As with many teaching practices, there was a focus on examining and understanding associated student outcomes. The data in this study revealed that outcome assessment was an important part of the teaching practice for participants. Each participant related experience with measuring outcomes or a need to measure outcomes for understanding their teaching practice and the sustainability of its use in physical therapist education. Outcomes associated with physical therapist student confidence, comfort, and preparedness have been the primary findings documented in the literature (Nithman et al., 2016; Ohtake et al., 2013; Silberman et al., 2016). The participants’ own limited findings of positive outcomes was discussed as a driver of their future practice. Each participant was aware of the limited proof of the modality beyond their own observations and a few studies. In medicine, outcomes research has begun to demonstrate improved patient outcomes and care process (Griswold-Theodorson et al., 2015). Some participants feared that their minimal evidence linking outcomes beyond students’ affective behaviors and preparedness limited the sustainability of simulation education.

**Development of the teaching practice evolves through experience.** To achieve increased expertise in any practice area, extensive experience with the domain must be achieved
The second super-ordinate theme, *Development of the teaching practice evolves through experience*, which includes sub-ordinate themes *Influence of their other lived experience* and *Advancement in expertise through ongoing simulation practice*, suggests how conversations between the individual participant and the researcher uncovered that their ability to teach with simulation improved over time. Participants’ life experiences and their ongoing experience using the teaching method influenced this advancement.

An educator’s life experiences influence his or her teaching philosophy and growth over time (Ornstein, Pajak, & Ornstein, 2011). Each of the participants’ life experiences appeared to impact their teaching experience and development as a simulation educator. The common life experience for each participant was his or her clinical background as a physical therapist. Their physical therapist knowledge and clinical mindset was found to predispose participants to certain assumptions and expectations. This embedded knowledge has been identified as part of the academic faculty process (Pataraia, Margaryan, Falconer, & Littlejohn, 2015). In this study participants’ life identity as physical therapists influenced the types of simulations each participant created. Participants used their prior clinical experiences to fill in the gaps left by their own training. In addition to providing content knowledge to inform their practice, their physical therapist practice allowed them to meet some of the challenges of being a simulation educator. Participants reported that their abilities to be flexible, organized, multitask, and make quick decisions were learned through being a physical therapist.

The study demonstrated that participants’ individual experiences assisted them in making sense of their teaching practice. Participants credited their personality with helping them learn and participate in simulation practice despite the rigorous time commitment. On a deeper level, participants drew on the mistakes they made to assist their students. Participants were found to
understand connections between what they had experienced and what they wanted their students to learn. The data demonstrated that participants viewed this connection was viewed as beneficial to their ability to teach with simulation. Similar findings have been uncovered in physical therapist research. Hilliard (2011) has completed a dissertation examining physical therapists’ development of cultural humility. In this study and Hilliard’s, physical therapists were found to use previous life experiences and focus on the patient to place their experiences in meaningful context.

This study described how each participant began his or her use of simulation on a different path. Several faculty began with training or participated in training sessions during their early years of simulation training. Evidence posits that training is essential to successful simulation teaching (Deering et al., 2012; Kordowicz & Gough, 2014). In this study simulation instructor education varied among participants. Several participants attended structured courses, but two participants had no formal training at all. No evidence was found by the researcher that training itself made a difference in the faculty’s perceived ability to teach with simulation. What was understood was preparatory education was helpful in giving participants some structure to begin and continue their teaching practice. However, the participants who did not have any training were able to gain this structure through self-discovery.

With ongoing experience, participants were able to repeat the same simulations within their teaching. Such repetitive practice is noted to increase skill acquisition (Issenberg, McGaghie, Petrusa, Gordon, & Scalese, 2005). The findings of this study demonstrate that participants benefitted from their own repetitive practice teaching simulation as ongoing practice led to development of their teaching expertise. Repetition and modification were seen to offer participants the opportunity to refine their teaching practice and to rely on their previous teaching
with simulation to decrease their anxiety and improve their teaching.

Each participant reported using self-reflection in his or her teaching practice with simulation. This was found to be in part due to the reflective aspect of simulation teaching, as faculty were seen to incorporate their own reflection after having facilitated student reflection on their performance. One previous example of a physical therapist faculty’s use of self-reflection in simulation leading to change in teaching was found in the literature. Cahalin et al. (2011) demonstrate the ability to change instruction based on observation and reflection.

For participants in this study, the use of reflection led to ongoing evolution of teaching practice. Participation in this study created a space for participants to reflect on their teaching practices. In some instances, participants acknowledged they had benefitted from reflecting on their practice with the researcher as part of this study. Use of the IPA methodology in this study provided space for this ongoing reflection as the researcher was able to follow up on conversations through a multi-interview approach (J. A. Smith et al., 2009). The participant’s acknowledgement that their conversations with the researcher assisted their own teaching practice provided evidence that this research method was an appropriate choice for this research question.

**Presence of academic constraints.** Simulation is a resource-intense teaching modality that requires financial resources and significant faculty time (Glavin & Maran, 2003; Nimmagadda & Murphy, 2014). Participants in this study discussed how they understood their teaching practice with simulation to be affected by their respective academic environments and by the presence or lack of academic support. These findings were presented in the study as the super-ordinate theme *Presence of academic constraints*, which encompassed sub-ordinate themes *Limited by practicality* and *Influenced by academic support.*
There was evidence from each participant that the experience of teaching with simulation was not entirely under his or her own control. While the academic freedom common in higher education allowed faculty latitude to include simulation in their teaching practice, it did not always provide time and space for them to actually conduct simulations. Participants were limited by student schedules, availability of a simulation center, and other teaching responsibilities. There is evidence in the literature that practical time constraints in physical therapy programs have limited the practice of simulation. For example, Shoemaker et al. (2011) has written about his method of conducting high volume simulations with a large student cohort to demonstrate their feasibility in large PT programs. In this study, faculty were able to run 64 physical and occupational therapy students through a simulation experience in a total of four hours.

Teaching demands are known to increase when simulation education is added to a faculty member’s teaching practice (Acton, Chipman, Lunden, & Schmitz, 2015). Participants in this study voiced an understanding of this constraint. Participants’ use of creative methods such as scheduling simulations in the evenings, using small groups, and limiting the number of simulations to a realistic number they could manage were viewed by the researcher as methods to continue their simulation practice despite the practical constraints. The data demonstrated that participants’ interpretations of their experiences had convinced them it was worthwhile to continue forward because of the benefits they had witnessed in their students’ learning.

This study uncovered academic support as an important catalyst for participants’ teaching practice. The data revealed that the three participants who had a systematic level of support beyond their individual program were able to have more varied and copious experiences with simulation than the other participants. Inversely, lack of academic structured support was seen as
a limitation to participants’ teaching practice in two ways. The absence of simulation support staff required some participants to take on additional roles and responsibilities, such as simulation set up and technology coordination. These roles limited participants’ time and decreased their ability to use simulation in their teaching practice to the extent they believed would be beneficial to students. Regardless of the presence of limitations and support, each participant was understood by the researcher to be working to advance simulation education in his or her teaching practice due to a belief in its efficacy.

**Interconnectedness of simulation and interprofessional education.** Interprofessional education is defined by the World Health Organization as education that takes place “when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes” (World Health Organization, 2010). While interprofessional simulation literature was reviewed for this study, the researcher chose to not focus on interprofessional education through simulation. In fact, not a single semi-structured research question specifically asked about interprofessional practice. However, in examining the data, significant dialogue took place between participants and the researcher regarding the use of simulation education for the purpose of educating students about interprofessional practice. This significance led the researcher to isolate this as a separate theme, despite some carryover of aspects within this theme, such as fidelity. The fourth super-ordinate theme, *Interconnectedness of simulation and interprofessional education*, uncovered two sub-ordinate themes *Fulfills interprofessional requirements of teaching* and *Importance of interprofessional collaboration*.

The Commission of Accreditation of Physical Therapist Education (2016) requires interprofessional collaboration and practice to be part of the standard physical therapist entry-level. The results of this study uncovered a commonality among participants using simulation
education to meet this requirement and a shared belief that simulation education was an
appropriate method for teaching interprofessional content such as teamwork and communication.
This belief is supported in the literature. Bagatell and Broggi (2014) find that having physical
therapy and occupational therapy students and faculty work together through interprofessional
simulation gives them the ability to address any misconception of roles, provide clarification of
roles, demonstrate the importance of communication, and increase confidence. Buckley et al.
(2012) conclude that students from a variety of professions (medicine, nursing, and other health
professions, including physical therapy) who participated in an interprofessional simulation
experience had an increased perception of the importance of interprofessional teamwork
afterwards.

Participants in this study had differing experiences beginning and continuing
interprofessional simulation education. Some participants began their simulation practice
through joining other disciplines, such as nursing, to promote interprofessional education at their
institutions. Others expanded their use of simulation to include interprofessional objectives and
looked for other professions to join them. Participants said that in their experience,
interprofessional simulation increased the fidelity of the simulation and more closely mimicked
the real world setting. Several participants expressed a sense of wanting their students to learn in
an interprofessional context because they will eventually graduate to practice in that context.

The experiences the participants had as physical therapist educators teaching within
interprofessional simulation education required a commitment to interprofessional collaboration
with other health professions faculty. Participants’ responses suggested that they were part of, or
were working toward being a part of, an interprofessional simulation community of practice.
Participants’ experiences with this are mirrored in the literature. Hargreaves and Fink (2012)
emphasize that sustained communities require a commitment to the task and the community. This commitment includes the ability to evolve with mutual respect and understanding (Hargreaves & Fink, 2012).

Participants’ experiences working with other faculty were seen to align with literature on cultural relationships in higher education. Participants discussed strategies they used to work as a team, much like Bui and Baruch (2010), who assert that an understanding of culture and how different professional cultures work together is essential in higher education. Participants also had experiences working with students to examine what limited their understanding of the roles of other professions. This is supported by Frederick et al. (2010), who demonstrate, when examining student simulation actions though culturally responsive theory, that their perceptions and biases about their own profession are apparent and acknowledged within a simulation.

The data indicate faculty consider their interprofessional education and simulation teaching practice to be linked, given that they are choosing simulation as the method to teach this content. This study did not seek to examine this connection beyond the experiences participants had with interprofessional education. It is unclear if interprofessional education increases the importance of simulation in their practice, or vice versa. However, since examining faculty experience with interprofessional education in contexts other than simulation was not the purpose of this study, further conclusions cannot be drawn.

**Transforming their lived experiences.** This super-ordinate theme represents the transforming influence teaching with simulation has had on participants’ personal and professional lives. To follow the researcher asked participants if having simulation in their teaching practice has influenced or changed other aspects of their professional career and personal growth. The researcher did not explicitly ask about “transformation,” but did ask if their
simulation education experiences had changed them. Each of the eight participants explained through conversations with the researcher how the experience of teaching with simulation had led to sustained changes in his or her professional and/or personal lives, creating a new reality for them. Participants were asked to reflect on their teaching practice through this research study. Mezirow (1991) discusses how critical reflection is an essential component of transformation. The process of reflecting and discussing leads to problem solving and validity. This review of experience allows people to make sense of the transformations that have occurred. Participants described these transformations after reflecting on the question. Several participants were able to discuss transformations when asked at the second interview. In a few instances, participants’ review of the first interview transcript led to the discovery of transformation. For some participants, transformations were in professional development and enjoyment of teaching. For others, the way they communicated and related to their family and patients was transformed. One participant discovered her self-worth.

For several participants, the experiences they had with using simulation education in their teaching practice initially began as a dilemma, a need to learn a method of teaching. Through the 24 conversations conducted with eight participants, the researcher began to understand that participants’ experience with simulation transitioned from one of merely using a teaching method into becoming part of their teaching purpose. The level of this purpose varied, but each participant expressed sentiments that teaching with simulation was not limited to their time in the simulation center. The learning they received from this teaching practice carried over to aspects of their personal and professional lives. Cranton (1996) describes adult teachers who learn teaching through content, in other words, they learn teaching through the practice of teaching itself. Cranton (1996) suggests that transformation of more than teachers’ educational practice
occurs through teaching. From the data, the researcher cannot determine if simulation was the sole reason for these transformations, but does believe there is evidence the participants had varying transformations which were in part influenced by having simulation in their teaching practice.

Further exploration of the participants’ experiences in light of transformative learning theory and related research is provided in the next section.

**Key Findings in Relation to Transformative Learning Theory**

Transformative learning theory is a theory of adult learning, which explains that an adult’s learning in a meaningful context transforms the learner into a new reality (Mezirow, 1991). Transformational learning occurs when people encounter a dilemma requiring action and self-reflection, a situation that accounts for the learners’ awareness and reflection upon their own emotional response within their learning (Taylor, 2008). Use of transformative learning theory as a framework informed this study’s findings in two distinct ways. The first followed the study proposal. Transformative learning theory was used because it is used in the literature to describe the process of simulation education in other disciplines and was thought to provide a common understanding between the participants and the researcher (Anfara & Martz, 2006). Transformative learning theory guided the semi-structured research questions for the interviews. The proposed intent of the framework was to illustrate if specific components of transformative learning theory were present. However, through examining all of the data found within this study, another purpose of the theory surfaced. The researcher was able to understand how the participants themselves made sense of their experiences with simulation education through problem solving and meaning making; this also aligned with transformative learning theory. Each of these uses of transformative learning theory is described below.
In reviewing the data analysis, the researcher only found one instance when a participant explicitly acknowledged or mentioned transformative learning theory or any intentional use of simulation to transform students. Even in that case, the participant did not use the word “transform,” but rather described the changed learning in a way the researcher considered transformational. Participants were found to reference “constructivist” methods and “active adult learning” and “overall simulation pedagogy,” but not to have intentionally used simulation education to transform student learning. In examining the study findings, the researcher did note several aspects of the participants’ experiences and statements that relate to several of the 10 original tenets of transformative learning theory. Participants emphasized that they facilitated self-reflection in their students and themselves through simulation education. Mezirow (1990) explains that critical reflection leads to transformative learning through making a person question what they are learning and doing in order to make new meaning. This process was experienced by each of the participants, who expressed through their conversations with the researcher their path to having made sense of their own experiences with simulation education through ongoing reflection.

Participants were found to create distorting dilemmas in their simulations that matched what students would encounter in a realistic environment. These dilemmas were created so their students could make a mistake, reflect on their thoughts and actions, and change their practice. This intentional use of distorting dilemma, self-examination, and self-reflection all follow components of transformative learning theory, even if participants were not using it intentionally. Participants did experience student outcomes like emotional enjoyment, increased self-confidence, and increased growth as adult learners. Participants acknowledged that the outcomes documented in the literature and in their own practice had limitations. The one participant who
did acknowledge she experienced student transformation experienced this only within intensive four hour simulation sessions that other participants did not have. Research has shown that students who undergo transformative learning have a greater understanding of their emotions and actions and have been transformed into a new level of ability (Mezirow, 1991). It is unclear from the research findings if participants did not encounter more student transformations because of the length of time spent with students, lack of outcomes associated with simulation, or that student transformations did not occur.

The second way transformative learning theory informed this study was discovered through data collection and analysis. Through speaking and analyzing the participants’ conversations, the researcher realized that transformative learning theory helped her make sense of how the participants made sense of their experiences with simulation. The researcher’s double hermeneutic interpretation of the participants’ experiences revealed their own transformations. The researcher came to understand that participants’ use of simulation in their teaching practice transformed the participants themselves in individual ways, as discussed in the super-ordinate theme *Transforming their lived experience*.

In their experiences with simulation, participants encountered the problem of how to learn and how to execute simulation education in their teaching practice. This experience was a dilemma for them. Participants used self-reflection to understand their thoughts and actions, and then sought to further develop and change their teaching practice with simulation to refine their teaching.

Similar discoveries have been found in the literature. Merriam et al. (2012) posit that the design process that is part of creating transformational learning accounts for an overlap between research and practice of transformative learning. Transformative learning theory has been
utilized to uncover faculty development with education. Rhodes (2013) examines the journey educators take in becoming scholar practitioners. In that study, educators were seen to transform through their doctoral experience into doctoral researchers.

The researcher believes, through thoughtful consideration of the data as well as her own experience speaking with each participant, that transformations occurred through ongoing experience and reflection. Participants were found to have transformed aspects of their professional and personal lives through their experiences.

**Limitations of Findings**

This study helped us understand how physical therapist faculty made sense of their physical therapy teaching experiences in their practice. This study followed a structured process of qualitative research using an interpretive phenomenological analysis methodology. There are limitations to this study. In terms of demographics, the study captured participants from across the United States with varying levels of education. Email invitations went out to 31 simulation educators, of which eight participated. It was unable to equally represent men and women. While several other men were emailed about the study, only two agreed. However, of the 31 people contacted to participate, only six were men, thus a larger percentage of men than women agreed to the email invitation.

The study only included participants from accredited physical therapist programs in the United States. This was done to align teaching standards and curriculum. Simulation education does take place in many other countries as part of the preparation of physical therapists. While participants from other countries were excluded, their literature about simulation education practice was included.
The researcher conducted all interviews using Skype or Google Hangout so she could see and hear participants. At times technology limited the conversations, by requiring restarts or causing words to be missed due to feedback. Many of these were recovered through participant review of transcripts. While technology allowed for an audio and video conversation, the researcher does not know if in person interviews might have promoted an even deeper conversation.

The study methodology is subjective and embraces the researcher’s subjectivity. Cautious steps were taken to ensure a rigorous study was done. The researcher used annotated memos participants’ own words to keep their voice and maintain sensitivity to context and to heighten her awareness of her positionality and objectivity. Participants were given access to their first two transcripts. A team of educational scholars oversaw the study.

This study was designed to describe particular individual experiences as interpreted through a shared experience with the researcher. This purposely excluded a more general understanding of the phenomenon of simulation education in physical therapy in favor of gaining a deeper understanding of the particular individual experience. Use of IPA methodology encourages an intense experience of three interviews with a small group of participants. This study only told the stories of eight individual physical therapist faculty members. While their experiences share some commonalities, these eight people cannot represent all physical therapist simulation faculty educators. The results of this study are transferable, but are not able to be generalized to all faculty who teach with simulation in physical therapist programs. There is likely more to be learned about the faculty experience.

The greatest limitation was the lack of research specific to physical therapist education with simulation. In contrast to other educational practices, there are few scholarly works
available. This prevented a richer comparison of faculty experiences in this study with others in the field. This researcher and the participants acknowledged this limitation throughout the interview process. The author informed the study using simulation education literature from other professions, most notably medicine and nursing.

Implications for Practice

The researcher added to the existing body of knowledge on the teaching practice of simulation education in physical therapist education through exploration of individual participant’s experiences. As part of this scholarship it is important to examine these findings in light of current and future practice. Three implications for practice are presented below.

Understanding training requirements. This study suggests that absence of formal training should not preclude faculty from adding simulation to their teaching practice. Prior research in fields other than physical therapy recommended formal training as a prerequisite for success (Deering et al., 2012; Kordowicz & Gough, 2014). Despite existing literature on the importance of formal training, and the researcher herself having received formal training, this study provides evidence that formal training is not required to be a simulation educator in physical therapy. Participants in this study were seen to provide consistent teaching with simulation education despite a variety of training.

Training and research in physical therapist education is limited. Faculty interested in pursuing simulation can begin through peer mentoring at their university or other professional contacts, and utilize other steps participants experienced to aid in their own professional development as simulation educators. Faculty seeking to begin without formal training should look to understand the universal traits revealed in the participants’ simulation teaching to inform their own practice, especially the debriefing practices that were noted as the primary focus in
both the literature and the participants’ experiences.

While physical therapist faculty looking to add simulation to their teaching practice should not let the absence of training deter them, it is recommended the profession of physical therapist education look to establish formal training or at least a more formal presence in interprofessional simulation education training courses. This training can be part of comprehensive courses or standard training-the-trainer curricula. Training-the-trainer programs have been found to be essential for success in other professions (Kordowicz & Gough, 2014).

**Call for outcomes research.** There is a clear consensus that ongoing research in physical therapist simulation education is required. Each participant noted the need for ongoing and more robust outcomes research. There is an ongoing need throughout the profession of physical therapist education to establish a more rigorous education research agenda (Jensen et al., 2016). This study suggests two ways of meeting this need: an expansion of ongoing outcomes research in simulation education, and a more copious examination of simulation outcomes through qualitative methodology.

This study supports the physical therapist educator perspective that examining the value of simulation education for students and patient care is essential to it being a sustained practice. The participants and researcher relied on evidence from other health professions due to the lack of physical therapist literature. Faculty conducting simulation education should measure outcomes as part of their standard practice, and then further the profession by sharing these outcomes through publication and presentation. A recent study published by Judd et al. (2016) demonstrates one effort to meet this challenge. This study in Australia looked to validate measuring student performance in simulation with their clinical performance tool. This study found that students can be evaluated in simulation using an outcome assessment for clinical
education. Further outcomes assessments promoting the results of simulation education are needed to assist the profession in looking at the adoption of simulation as an evidence-based teaching method specific to physical therapist practice.

Qualitative research seeks to provide not only a research finding, but the explanation of the multiple processes or behaviors that are occurring (Ponterotto, 2005). The researcher noted in her examination of physical therapist literature that most of it has used quantitative analysis. Results of this qualitative study demonstrate that a deeper and wider picture can be provided using a rigorous qualitative study that provides more information about the process of physical therapist simulation education. One qualitative study found in the literature does establish a link between student preparation for clinical work and simulation education (Silberman et al., 2016). That mixed methods study does not find significance in quantitative measures, but it does find significance in their qualitative analysis. Results of the Silberman study show the need for further qualitative research to seek answers to questions about simulation education.

**Faculty support.** Physical therapist faculty are responsible for developing curricula that engage students and prepare them for future practice. Faculty are called by the profession to be innovative and forward thinking “for future transformative practice” (Dean and Duncan, 2016, p. 272). This study demonstrates that physical therapist simulation educators are striving to be innovative and forward thinking for their students’ learning. Faculty are working to prepare students to become interprofessional health care team members capable of making complex decisions and caring for their patients. Faculty training and development for simulation education in physical therapy needs to consider that medical simulation and interprofessional education is not a technical skill. It is not easily taught in a didactic lecture. Training must include an emphasis on the trainer’s emotions and feelings as well as on his or her own time and
resources. Robertson and Bandali (2008) report “the challenge for organizations will be to foster this collaboration by working in partnership to provide the resources and processes necessary to achieve their shared vision and goals” (p. 504).

Findings from this study show that this teaching practice is resource intensive. Faculty development and support must take place to assist faculty with meeting the intensive commitment to simulation education. The Army simulation program asserts that it is essential to have an organizational framework, which includes faculty training and development (Deering et al., 2012). Faculty in this study who had comprehensive support beyond their programs were found to be able to provide and develop more creative experiences. Faculty commitment alone will not sustain this practice.

**Implications beyond physical therapy.** Although this study aimed to examine the experience of individual physical therapist simulation educators, the impact to the field of simulation education in general warrants discussion. It is important to note that the success of simulation as a method for educating healthcare providers to save lives has lead to widespread adoption of simulation to facilitate education of a variety of other clinical skills (Blackstock and Jull, 2007). The use of simulation in continuing medical education has demonstrated successful outcomes with patient safety and decreasing errors (Curtis et al., 2012). Simulation is currently widely used in medical education, including not only continued education for practitioners, but also education of medicine students to increase their preparedness for medical practice (Mathai et al., 2014). Successful student outcomes within medicine have led to its expansion into other healthcare fields, including nursing, social work (Dreifuerst, 2009; Nimmagadda & Murphy, 2014; N. Smith et al., 2012), and physical therapy.
Each profession that defends, defines, and describes the use of simulation education adds to the collective body of knowledge on its use and importance in education. The field of physical therapist education should seek to promote further research and establish standard outcomes to support the use of simulation education and ensure the graduating practitioner is capable of safe and effective practice. The lessons learned from this study identify that physical therapist simulation educators follow a practice consistent with other health professions. The field of physical therapist education is well positioned to continue to add evidence to the collective body of simulation education research and establish simulation education as a required method in healthcare education.

**Implications for Future Research**

Ongoing research in the field of physical therapist education is documented as an unmet need. Recently scholars in the field of physical therapist education provided a call to action identifying more robust educational research in physical therapy as critical to the profession’s survival (Jensen et al., 2016). This study contributed to that needed body of educational scholarship. Insight gained from this study provides a path for future meaningful research. Several suggestions are discussed below.

**Examine the actual teaching.** This study demonstrated the ability for qualitative analysis to uncover faculty experiences with simulation education, and informed the teaching practice for current and future simulation educators. Further research into faculty development and experience with simulation education can be go beyond this study. For example, a case study approach that combines participant experiences with observations of their simulation teaching and a review of teaching documents such as grading rubrics may provide a more robust description of the faculty role and experience in simulation education.
Further examine interprofessional education. The study identified an interconnectedness between simulation in physical therapist education and interprofessional education that was not fully explored because it was beyond the scope and purpose of this study. An exploration of this link may serve the profession of physical therapist education and interprofessional education as a whole. In addition, ongoing assessment of interprofessional simulation education may deepen the fidelity of simulation education that was described by participants as paramount to its success.

Further examine transformative learning. Further research into the practice of simulation education as a transformative learning method in physical therapist education and other disciplines should be explored. This study identified links between transformative learning and physical therapist simulation education, but did not reach any conclusions. This may have occurred due to the study design itself, which limited the degree to which we could come to understand transformation through simulation education. Further studies on this subject are warranted.

Measure outcomes. Participants in this study remarked that scholarly research using quantitative and qualitative methods on outcomes associated with simulation is essential to the sustainability of the teaching method and to its expanded use in and beyond their programs. It is important to note that each participant in the study affirmed an ongoing commitment to assessing outcomes of their teaching. The researcher believes the ongoing practice of scholarship on teaching and learning by the physical therapist faculty participants will serve the profession over time. Despite the constraints each of them noted, participants in this study were found to be committed to examining the practice of simulation education. They each expressed a need for ongoing research into the objectives of simulation.
Explore other topics from the literature. Finally, some aspects of simulation education that had been identified in the initial literature review were not uncovered in participant experience. Most notable among these is the suggestion of replacing clinical practicum hours with simulation. The researcher believes this suggestion warrants thorough investigation as an important aspect of simulation education in the future. Other previously provided research suggestions may pave the way for the eventual examination of simulation education as a method of clinical practice.

Conclusion

This study fulfilled the its purpose of understanding physical therapist faculty perspectives and their experiences with using simulation in their teaching practice. Through an interpretive phenomenological analysis approach, qualitative data was obtained that described experiences of physical therapist faculty that were previously not known. This study furthered the process of simulation education in physical therapy through a shared experience and answered this research question: How do physical therapist faculty members make sense of their experience with using simulation in their teaching practice? Eight physical therapist faculty members from across the country participated in three individual semi-structured interviews with the researcher.

Data analysis from these interviews uncovered five super-ordinate themes and eight subordinate themes. Key findings from each of these themes were examined and discussed in light of the literature, and then examined through the lens of transformative learning theory. The faculty experience in physical therapist education was found to follow a universal process that is consistent with the literature in other health professions. Barriers to faculty experience and unique aspects of physical therapist faculty teaching, including the role of interprofessional
Transformative learning theory was used as a framework in this study (Mezirow, 1991). This framework, in addition to the literature review, provided context for the researcher and the participants on what simulation education is. By examining the faculty experience with a transformative learning lens, faculty were understood to evolve in their teaching practice through ongoing practice and reflection. This practice and reflection upon a new teaching modality led to sustained learning and personal or professional transformations.

This study furthered the practice of simulation education by uncovering the actual experiences of simulation educators in physical therapy. This study is the only of its kind examining the faculty perspective in physical therapist simulation education. Prior studies in physical therapist simulation focused on student outcomes (Mori et al., 2015). The findings of this study inform the educational process of simulation education. The uncovering of faculty experience provides evidence that warrants ongoing research and support to develop and expand the teaching practice of simulation education as part of physical therapist education.
References


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learning in clinical simulation. *African Journal of Health Professions Education*. 5(2),
80-83.

Appendix A: Screening email

Hello. Thank you for your interest in participating in this study examining faculty's experience with simulation education. This screening email is being sent to you because you indicated you are interested in being a participant for this study. Please answer the four brief questions on information needed in order to ensure findings from this study would represent rigorous doctoral work. I appreciate your time in answering the following brief questions.

Questions:
1. How long have you been teaching with simulation education?
2. Which courses or physical therapy content areas do you utilize simulation education?
3. What preparation and training have you had in simulation?
4. What is your definition of simulation education?

Thank you. I appreciate your time. Participants in the study need to meet the criteria of a minimum amount of time using simulation and a shared definition. If you meet these inclusion criteria, you will be notified via email within the next seven business days to be part of this study and further information will be sent at that time including consent to participate.
Appendix B: Participant Inclusion Email

Dear Faculty and Simulation Educator,

Thank you for your willingness to participate in the research study entitled:

Teaching with simulation: The experience of physical therapist faculty

Your experience through your email screening response has been identified to be a fit for this doctoral research study. Attached please find two documents. 1) The consent form to participate for you to sign and return electronically as soon as possible. 2) A calendar with suggested times to schedule our three conversations. Please select several times that will work for you for the first, second and third interview and send these times back to me when you return the consent form. Please indicate if you prefer to be interviewed via Skype or Google Hangout. I will send you an email confirmation of both interview times and an invitation for the interviews via skype or google hangout.

Thank you and I look forward to speaking with you in the near future,

Sincerely,

Kristin Curry Greenwood PT, DPT, MS, GCS
Appendix C: Email Invitation to Participate

Dear Faculty member and Simulation educator:

I am in the process of completing a Doctor of Education degree at Northeastern University. In partial fulfillment of my doctoral studies, I am inviting you to participate in a research study, which is titled:
Teaching with simulation: The experience of physical therapist faculty

I am a recruiting participant who meet the following criteria:

a) Faculty members who teach within an entry-level accredited physical therapy program
b) Are licensed physical therapist.
c) Have a minimum of one-year experience with teaching with simulation using high or low-fidelity or standardized patients.

Faculty who agree to participate will be asked to do the following:

a) Participate in one screening email with four brief questions to identify participants meet the criteria of a minimum amount of time using simulation and a shared definition.
b) Meet with me virtually for 20-30 minutes one-on-one using Google Hangout or Skype to share some general information about your professional background and simulation experience
c) Meet with me virtually one-on-one using Google Hangout or Skype to participate in a confidential 60-90-minute interview about your experiences with using simulation education in your courses to prepare students for physical therapist practice.
d) Read an e-mailed copy of the interview transcription for first and second interview, and let me know, based on any reflective thoughts following our interview, if you would like add or clarify anything.
e) Meet with me virtually one-on-one using Google Hangout or Skype to participate in a confidential final 15-60-minute interview for any clarification or final thoughts about your experiences with using simulation education in your courses to prepare students for physical therapist practice.

Participation is voluntary, and you are free to withdraw from the study at any time. This study has been approved by xxxxx

If you would like to participate in this study, please send me an e-mail confirming your interest. I will send you the screening email questions and subsequently answer any questions you may have. After you return via e-mail the questions and I identify your experience will fit with this study, I will notify you via email with a consent form for you to sign. At that time, we can establish an interview timeline for our three conversations.
If you are aware of other participants who may be interested in this study, please forward this email to them or email xxxxxxxx their email address to send them this email invitation to participate.

I will be happy to answer any questions you have about the study at any time. You may contact me at xxxxxx or at xxxxxx.

Sincerely,

Kristin Curry Greenwood PT, DPT, MS, GCS, EdD student.
Appendix D: Unsigned Consent Form

UNSIGNED CONSENT DOCUMENT

Northeastern University, College of Professional Studies Doctor of Education Program

Name of Investigator(s): Sara Ewell-Principal Investigator, Kristin Curry Greenwood-Student Researcher

Title of Project: Teaching with simulation: The experience of physical therapist faculty

Request to Participate in Research

We would like to invite you to take part in a research project. The purpose of this study is to speak with faculty who use medical simulation to understand their experience with using this teaching method in physical therapist education.

You must be at least 18 years old to be in the research project. If you decide to take part in this study, we will ask you to participate in three interviews, ranging from 15-90 minutes each one-on-one with a researcher through Skype or Google Hangout technology. After the first two interviews are complete you will be asked to review your transcripts from these interviews. Once your consent is received a timeline for these interviews will be established at times that are convenient to your schedule. You will be interviewed using Skype or Google Hangout at a time and place that is convenient for you. The first interview will take approximately 30 minutes; the second interview will take 60-90 minutes and the third final interview will take 15-60 minutes. Following completion of the first two interviews we will send you your interview transcripts to review for any comments prior to data analysis. You will have three business days to review the transcripts and comment via email to greenwood.k@northeastern.edu if necessary.

There are no foreseeable risks or discomforts to you for taking part in this study. Participants will be participating in shared conversations with the researchers that are similar to conversations the participants have with colleagues at their own work place when discussing their teaching practice.

There are no direct benefits to you for participating in the study. However, the information learned from this study may help to further the educational practice of simulation education in entry-level physical therapist programs.

Your part in this study will be handled in a confidential manner. Only the researchers will know that you participated in this study. Any reports or publications based on this research will use only group data and will not identify you or any individual as being of this project.

The decision to participate in this research project is up to you. You do not have to participate and you can refuse to answer any questions. Even if you begin the study, you may withdraw at any time. You will not be paid for your participation in this study.

If you have any questions about this study, please feel free to call Kristin Greenwood student researcher at greenwood.k@northeastern.edu or 603-461-7022, the person mainly responsible for the research. You can also contact Sara Ewell s.ewell@northeastern.edu the Principal Investigator.

If you have any questions about your rights in this research, you may contact Nan G. Regina, Director, Human Subject Research Protection, 400 Renaissance Park, Northeastern University, Boston, MA 02115. Tel: 617.373.9698. Email: n.regina@northeastern.edu. You may call anonymously if you wish.

You may keep this form for yourself.

Thank you.

Kristin Curry Greenwood PT, DPT, MS, GCS EdD student

Approved by: [Signature]

Northeastern University - Human Subject Research Protection

Date: 5/21/2015
Appendix E: Demographic Information

This information will be obtained through the first semi-structured interview. If any information is not obtained in interview one it will be asked in the follow up interview.

- Years as a faculty member?
- Clinical practice area?
- Rank?
- Area of the country?
- Presence of simulation center at their institution?
- Level of Simulation training (defined as certified instructor, attended a comprehensive instructor workshop, attended informal instructor trainings through APTA or other program, or on the job training)?
- Level of Faculty education, Terminal degree, board specialization?
Appendix F: Interview Protocol

**Interview Protocol Form Interview 1**

**Student Interview Protocol**

Institution: Northeastern University__________________________

Interviewee (Pseudonym): ________________________________

Interviewer: Kristin Curry Greenwood________________________

**Introductory Protocol**

I am a doctoral student at Northeastern University. As part of my doctoral studies, I am conducting individual interviews to find out more about the experiences physical therapist faculty have had with simulation education. In order to gain the most information possible we will be looking for you to share many experiences you have had. You have been selected to speak with me today because you have been identified as someone who has thoughts to share about the experience of teaching with simulation. Our research project focuses on the faculty experience with simulation education. Through this study, we hope to gain more insight into the faculty experience for faculty who teach in an accredited physical therapist program using simulation. Hopefully this will allow us to understand the faculty experience with simulation education.

Because your responses are important and I want to make sure to capture everything you say, We are using Skype/Google hangout for a video and audio conversation. This interview will be recorded and transcribed. Do I have your permission to record this interview? [If yes, thank the participant and turn on the recording equipment]. I will also be taking written notes. I can assure you that all responses will be confidential and only a pseudonym will be used when quoting from the transcripts. My research team and the transcription service will be the only one privy to the tapes which will be eventually destroyed after they are transcribed. To meet our human subject’s requirements at the university, you have already signed and returned by email the consent form. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) we do not intend to inflict any harm. Do you have any questions about the interview process or how your data will be used?

We have planned this first interview to last no longer than about 30 minutes. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning. Do you have any questions at this time?
Interview 1: Demographics and overall simulation experience 20-30 minutes

- Demographic Questions as noted in above appendix

- What is your background as a physical therapist and an educator?
  
  Prompts: Ask about clinical practice, how long in academia and courses they teach

- Can you describe the type of physical therapist program you teach in?
  
  Prompts if needed: How large? Type of student?

- Can you tell me about your decision to start adding simulation to your teaching practice?
  
  Prompts if needed: How did you decide to start? which courses? Who or what motivated you?

- I would like to hear about your experiences with training and orienting to using simulation?
  
  Prompts if needed: How did you get started?; How did you learn how to do it? Any formal training?
Interview Protocol Form Interview 2

Student Interview Protocol

Institution: Northeastern University__________________________________________

Interviewee (Pseudonym): ______________________________________

Interviewer: Kristin Curry Greenwood________________________________________

Introductory Protocol

This interview is our second interview together to discuss your experience as a physical therapist faculty member who teaches with simulation. Before we start this interview I would like to remind you of the study and interview procedures as I did in the first interview. Is this alright with you? (If yes proceed, if no answer questions).

I am a doctoral student at Northeastern University. As part of my doctoral studies, I am conducting individual interviews to find out more about the experience physical therapist faculty have with teaching using simulation. You have been selected to speak with me today because you have been identified as someone who has thoughts to share about the experience of teaching with simulation. In order to gain the most information possible, we will be looking for you to share many experiences you have had. Our research project focuses on the faculty experience with simulation education. Through this study, we hope to gain more insight into the faculty experience for faculty who teach in an accredited physical therapist program using simulation. Hopefully this will allow us to understand the faculty experience with simulation education.

Because your responses are important and I want to make sure to capture everything you say, We are using Skype/ Google hangout for a video and audio conversation. This interview will be recorded and transcribed. Do I have your permission to record this interview? [If yes, thank the participant and turn on the recording equipment]. I will also be taking written notes. I can assure you that all responses will be confidential and only a pseudonym will be used when quoting from the transcripts. My research team and the transcription service will be the only one privy to the tapes which will be eventually destroyed after they are transcribed. To meet our human subject’s requirements at the university, you have already signed and returned by email the consent form]. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) we do not intend to inflict any harm. Do you have any questions about the interview process or how your data will be used?

We have planned this second interview to last no longer than about 90 minutes. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning. Do you have any questions at this time?
Interview 2: 60-90 minutes. The faculty experience

- Q1: When we spoke last time we talked about how you got started using simulatoin in your teaching practice. Now we are going to discuss more in depth your teaching experiences using simulation. First I would like to talk about the process you go through designing a simulation for your students, how do you get started? Is there a process or similar experience you go through?

- Q2: Can you give me a few examples of simulation experiences you have designed?

- Q3: Can you talk about how you decide on what is important to include with the experience?

- Q4: Now lets move on to discussing the execution of the actual simulation itself. What is that experience like for you? Can you share with me a few experiences?

  o Cues here will be from previous interview. Such as “for example you said you use it in your geriatrics course….”

- Q5: How would you describe your experiences within a simulation that did not go well?

- Can you provide an example of a challenging or difficult experience for your students?

- Q6: How would you describe a successful simulation outcome for you?

- Can you talk about your experience with a successful simulation for your students?

- Q7: Now that we have discussed how you go started and your experiences in your teaching practice, I’d like to talk about if you think you have changed how you use simulation since you started teaching with simulation?
Are there stories you can share? What made you change?

Q8: In your experience has simulation education impacted your students learning?

Q9: Have you learned anything about yourself through teaching with simulation?

Q10 Aside from adding simulation to your practice as a method, has teaching with simulation changed you as an educator?

Has it changed other parts of your teaching practice? Can you give examples?
Interview Protocol Form Interview 3

Student Interview Protocol

Institution: Northeastern University__________________________________________

Interviewee (Pseudonym): ________________________________

Interviewer: Kristin Curry Greenwood________________________________________

Introductory Protocol

This interview is our third and final interview together to discuss your experience as a physical therapist faculty member who teaches with simulation. Before we start this interview I would like to remind you of the study and interview procedures as I did in the previous interviews. Is this alright with you? (If yes proceed, if no answer questions).

I am a doctoral student at Northeastern University. As part of my doctoral studies, I am conducting individual interviews to find out more about the experience physical therapist faculty have with teaching using simulation. You have been selected to speak with me today because you have been identified as someone who has thoughts to share about the experience of teaching with simulation. Our research project focuses on the faculty experience with simulation education. Through this study, we hope to gain more insight into the faculty experience for faculty who teach in an accredited physical therapist program using simulation. Hopefully this will allow us to understand the faculty experience with simulation education.

Because your responses are important and I want to make sure to capture everything you say, We are using Skype/Google hangout for a video and audio conversation. This interview will be recorded and transcribed. Do you have your permission to record this interview? [If yes, thank the participant and turn on the recording equipment]. I will also be taking written notes. I can assure you that all responses will be confidential and only a pseudonym will be used when quoting from the transcripts. My research team and the transcription service will be the only one privy to the tapes which will be eventually destroyed after they are transcribed. To meet our human subject’s requirements at the university, you have already signed and returned by email the consent form. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) we do not intend to inflict any harm. Do you have any questions about the interview process or how your data will be used?

We have planned this third interview to last 15-60 minutes. During this time, I am going to be asking you for any clarification or further thoughts on our previous interviews. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning. Do you have any questions at this time?
Interview Questions:

No pre-created questions will be used. This will be a final interview for any clarification on the previous interviews.
## Appendix G: Researcher Annotated Memos

<table>
<thead>
<tr>
<th>Title</th>
<th>Memo text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memo 7</td>
<td>Her background is similar to mine as I fell into PT. I need to be cautious of my positionality here as I go forward with future interviews.</td>
</tr>
<tr>
<td>Memo 12</td>
<td>This is a good connection to build a relationship with the participant</td>
</tr>
<tr>
<td>Memo 17</td>
<td>she doesn’t identify trouble with being a PT in training I wonder if it is her extensive ICU experience or more seasoned years of experience that may play into this?</td>
</tr>
<tr>
<td>Memo 19</td>
<td>I see more of my positionality in Participant 1 and Participant 3 interviews. It seems to lessen with subsequent interviews and I am glad I have this first demographic interview to iron this out before the longer interviews on the participant’s experience.</td>
</tr>
<tr>
<td>Memo 31</td>
<td>Here you see my agreement to demonstrate my thoughts on what the participant is saying. I would not code this but it was useful to build the relationship. If I did not say how I felt the interview would be cold and formal.</td>
</tr>
<tr>
<td>Memo 48</td>
<td>I would like to ask her to define constructivist methods on her own terms, is she following constructivist theory? What is she meaning here? How does this make sense to her?</td>
</tr>
<tr>
<td>Memo 54</td>
<td>I should ask about her Phd and research. Has her knowledge from the advanced degree changed her experience as a simulation educator, does she write and run sims differently now that she has research lenses?</td>
</tr>
<tr>
<td>Memo 68</td>
<td>In the interview participant was very emotional and excited to discuss simulation...</td>
</tr>
<tr>
<td>Memo 81</td>
<td>here I want to ask her about her view on nursing sim, but that is off my dissertation topic so I am deferring this question</td>
</tr>
<tr>
<td>Memo 92</td>
<td>Does she have a different experience in the two types of sim for example task trainer breath sounds verses the higher level psychomotor and decision making sim for real time decisions?</td>
</tr>
</tbody>
</table>
Memo 105 clarifying question, did you use sim as a pilot prior to sim as a teacher? which came first?

Memo 118 I was going to ask about faculty cross communication to make sure this happens in the clinics, but this is off my research question, so I deferred.

Memo 124 Has she always measured an outcome on her sims? She mentions her first had 3 questions on what they learned today in the experience

Memo 128 clarify exact amount of years doing sim. I think it was 2008? But be sure because she says she gets anxious but has more experience, others discussed they don’t get as anxious. I just think I should confirm 8 years. To be sure I represent her experience correctly.

Memo 134 good clarification here by researcher regarding purpose and to build a relationship

Memo 145 this did not lead to talking about sim experience so I am excluding it.

Memo 146 this participant is very repetitive.

Memo 152 she makes it seem so easy