ATTITUDES OF HEALTH PROFESSION FACULTY INVOLVED IN A SIMULATION–BASED INTERPROFESSIONAL EDUCATION EXPERIENCE

By Shannon Marie Ashe

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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ABSTRACT

Interprofessional education and collaborative practice are the current standards of the global healthcare field. In order to better understand the barriers to completing simulation-based interprofessional education (Sim-IPE), faculty attitudes and perceptions need to be identified and addressed. In the current study, the researcher sought to identify the attitudes of health profession faculty at a private university within a college of health sciences that includes over 20 academic programs, exclusive of medicine, in relation to a planned large-scale Sim-IPE in the acute care setting. Utilizing both a correlational and repeated measures approach, the researcher explored a previously planned interprofessional experience that allowed pretest and posttest measurements to be collected. The researcher surveyed faculty before and after the encounter utilizing the Attitudes towards Interprofessional Education (AIPE) and the Attitudes Towards Health Care Teams (ATHCT) scales. Archival data revealed 22 matched pairs of responses for analysis. Correlational analysis of post-test scale scores to years of experience was not significant. Paired *t*-test analysis of pre- and post-event measurement for each scale were not significant. Initial pre-event scores were largely positive, to the high end of the available scale. A ceiling effect created a monotonous sample that showed faculty, on the whole, greatly value interprofessional education and teamwork-based practice. Future studies should explore potential variation in faculty barriers to implementation that continue to exist after involvement in an event, as well as consideration of other scales to identify faculty attitudes in relation to involvement in a large-scale simulation-based interprofessional education event.

Keywords: Sim-IPE, faculty attitudes, health profession education, interprofessional education, IPE, simulation, higher education.

Dedication

This work is dedicated to: my husband, Chris, for the many hours I was away from the family; my children, Cole, Kaylee, and Alida, for allowing Mommy the time to write (almost) without interruption; and my parents and siblings for their amazing faith that I could complete this journey.

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List of Abbreviations

Attitudes Towards Health Care Teams (ATHCT)

Attitudes Towards Interprofessional Education (AIPE)

Health Professional Accreditation Collaborative (HPAC)

Individual Teamwork Observation and Feedback Tool (iTOFT)

Institute of Medicine (IOM)

International Association for Clinical Simulation and Learning (INACSL)

Interprofessional Attitudes Scale (IPAS)

Interprofessional Collaboration and Practice (ICP)

Interprofessional Education (IPE)

Interprofessional Education Collaborative (IPEC)

Interprofessional Practice (IPP)

Learning Style Inventory (LSI)

Readiness for Interprofessional Learning Scale (RIPLS)

Simulation-based Interprofessional Education (Sim-IPE)

Standardized Person (SP)

Student Perceptions of Interprofessional Practice – Revised (SPICE-R)

TeamSTEPPS Teamwork Attitudes Questionnaire (t-TAQ)

World Health Organization (WHO)

CHAPTER ONE: INTRODUCTION

Overview

Interprofessional collaboration and practice (ICP) has become the cornerstone of health care to improve patient outcomes and decrease medical errors. In order to provide a foundation in ICP, health profession programs have been charged with teaching this vital skill. Interprofessional education (IPE) is mandated by many accrediting bodies, but requires time, effort, resources, and administrative support to effectively administer (Interprofessional Education Collaborative [IPEC], 2016). Faculty must consider the venture worthwhile to invest time, resources, and experience. Concerns regarding faculty attitudes and perceptions has been considered in the resultant research. In the introduction the researcher will orient the reader to the background of both interprofessional education and simulation in health profession education. The researcher will further define the problem to be addressed, purpose of the study, research questions, and operational terminology.

Background

Coordination in health care is vital to patient outcomes. Over 50 years of census data revealed effective collaboration of health care professionals impacted clinical error rates, patient mortality rates, and length of hospital stay (World Health Organization [WHO], 2010). The growing concerns for global epidemics such as malaria, AIDS/HIV, and tuberculosis spurred interprofessional collaboration and has benefited from teams to improve disease management and education programs. Collaborative practice has been shown to decrease error rates in managing complex and chronic illnesses (IPEC, 2016). Acute-care medicine, managing complex conditions, requires patient-centered care that is coordinated amongst healthcare professionals (National Academies of Practice, 2019). Providing a means to enable students to understand and

form a foundation in teamwork is paramount to collaborative practice (Institute of Medicine of the National Academies, 2015).

With the field of health care constantly and rapidly changing, broad spectrum knowledge by any one profession is difficult. Publications in health care alone are increasing and researchers project that medical knowledge can double every 2 to 3 months due to the information available (Birt, Stromberg, Cowling, & Moro, 2018). Additionally, the same studies found collaborative care can benefit health care workers by providing increased job satisfaction, decreased staff turnover, and decreased tension and conflict among caregivers. Collaborative practice requires understanding of roles and responsibilities of each profession. This understanding will aid not only in delegation of care, but also in cross over of tasks required in patient care that can be shared by professions. Currently, the primary concern is that most health professions have been historically trained independently of other professions. "Healthcare professionals are predominantly trained in intraprofessional settings . . . each profession thus organizes its own teaching and is unaware of what is taught or learnt in other professions" (Khan, Shahnaz, & Gomathi, 2016, p. e278).

In the studies gained by the WHO (2010), people showed little understanding of the roles and responsibilities of what outside professions were to do, so little appreciation existed of the various professionals' abilities to work together to enhance patient care. When considering most health professionals were trained only within their own discipline and the resultant isolation was not conducive to meaningful interactions, change was needed at the foundation. With the results of the studies, the WHO set out to create a mandate for health profession education to include IPE in the course of study.

The core competencies of health profession education have changed to reflect the value

of appropriate interprofessional practice. The IPEC (2016) created and has since refined the core competencies of interprofessional education (IPEC Expert Panel, 2011). Emphasis on interprofessional communication and practices, roles and responsibilities of collaborative practice, interprofessional teamwork and team-based practice, and values/ethics for interprofessional practice have become the pillars of health profession practice. Creating opportunities for students to explore each of these domains of interprofessional practice (IPP) is an increasingly popular topic in health profession education.

Designing interprofessional learning experiences can be challenging (Palaganas, Epps, & Raemer, 2014). Collaboration among faculty in professions that have previously been taught and even practiced independently requires removal of preconceived prejudices and respect for other professions. Coordination of courses to allow students that are at similar levels of professional understanding requires knowledge of cross courses, which may involve administrative oversight. Time required to design an effective experience that meets objectives of multiple disciplines requires commitments to interaction among faculty in all involved disciplines (Beck Dallaghan, Hoffman, Lyden, & Bevil, 2016).

Several researchers have found students have gained improved awareness and perception of interprofessional practice through interprofessional education and simulation events (Aleshire, Dampier, & Woltenberg, 2018; Fewster-Thuente, 2014; Jutte, Browne, & Reynolds, 2016). Students gain increased awareness and appreciation for other health professions, improved communication with other disciplines, and better awareness of their own profession's role in health care. Current research supports faculty with positive attitudes towards IPE are more effective educators. Positive attitudes of faculty toward IPE influence students within the experiences (Guraya & Barr, 2018). Faculty must organize, emphasize, and demonstrate the

respect for professions to promote and implement beneficial IPE events. Steinert (2005) described faculty barriers to IPE include negative attitudes of faculty towards other health professions and collaboration with other disciplines.

Simulation-based education in the health professions has been highly effective in promoting professional communication and comprehensive learning (International Association for Clinical Simulation and Learning [INACSL] Standards Committee, 2016; Murphy & Nimmagadda, 2015). Simulation in health sciences involves delivery of content, experience with content, reflection and evaluation of experiences, and further experimentation and use of knowledge derived from earlier steps. This experiential learning cycle, described by Kolb (2015), expounds on the principles of Dewey's pragmatic constructivist learning and Piaget's cognitive development. Using these theories of learning better enables educators to develop and implement meaningful simulation-based experiences (DeCaporale-Ryan, Dadiz, & Peyre, 2016; Fewster-Thuente, 2014). However, faculty must understand and regard the value of simulation-based IPE in order to spend the time and effort necessary to create the ideal learning experience for their students (Mariani, Cantrelle, & Meakim, 2014).

Problem Statement

Following the WHO's 2010 Framework for Action on Interprofessional Education and Collaborative Practice, accrediting bodies have increased requirements for health profession faculty to implement IPE (Stoddard, Johnson, & Brownfield, 2019). IPE and collaborative practice have improved patient outcomes, decrease medical errors, and improve outcomes in epidemic disease outbreaks (Institute of Medicine of the National Academies, 2015). Barriers to IPE remain, such as time involved to create, scheduling conflicts, and lack of knowledge of roles and responsibilities (INACSL Standards Committee, 2016; IPEC, 2016; Wilcox, Miller-Cribbs,

Kientz, Carlson, & DeShea, 2017). Positive attitudes towards IPE of faculty and preceptors have been shown to have a positive influence on students' learning outcomes (Loversidge & Demb, 2015).

Simulation-based IPE (Sim-IPE) has shown to be a positive influence on student perceptions of teamwork, interprofessional collaboration, and understanding of roles and responsibilities (Failla & Macauley, 2014; Paige, Garbee, Brown, & Rojas, 2015). Analysis of Sim-IPE has revealed increases in students' self-efficacy in pre- and post- analysis (Paige et al., 2015). Students have also reported increased respect and understanding of other health professions following Sim-IPE (Liaw, Siau, Zhou, & Lau, 2014). Additionally, communication skills have shown improvement in Sim-IPE training (Costello et al., 2017; Sweigart et al., 2016).

Research regarding faculty attitudes after being involved in Sim-IPE has not been conducted. Previous researchers examined variations in disciplines, gender, clinical experience, and previous level of involvement in IPE; however, none have directly considered an evaluation of attitudes regarding a Sim-IPE (Hinderer et al., 2016; Joynes, 2018; Loversidge & Demb, 2015). Grymonpre (2016) and Steinert (2005) have also explored faculty development in improving faculty perceptions of IPE and realized a need to have faculty identify specific concerns to types of IPE. As Hinderer et al. (2016) noted faculty confidence and attitudes to IPE must be developed in relation to the various forms of delivery. Grymonpre explained that evaluations of the effectiveness of development and utilization of IPE in faculty must also be expanded upon to improve learning outcomes for students engaged in IPE.

Providing opportunities for multiple disciplines to interact within a Sim-IPE can be taxing on resources, time, and schedules. Previous researchers examined perceptions of and attitudes towards IPE with faculty within a health science college in a cross-sectional design (Al-

Qahtani & Guraya, 2016; Beck Dallaghan, Hoffman, Lyden, & Bevil, 2016; Gary, Gosselin, & Bentley, 2018). The researchers showed predominantly positive attitudes and perceptions, though not entirely positive for all disciplines studied. However, a well-planned event with five or more disciplines provides an opportunity to discover the effects on perceptions of IPE in regard to Sim-IPE. The problem studied was whether being part of a large-scale IPE simulation experience as a faculty member would affect or change attitudes towards IPE.

Purpose Statement

The purpose of this quantitative study was to explore the effects of a simulation-based IPE experience on the attitudes of faculty toward teamwork and IPE. The design was two-fold requiring both correlational and repeated measures analysis. In its correlational design, the criterion variable of level of experience in IPE has been measured against the predictor variable of attitudes of faculty after involvement in a Sim-IPE. In its repeated measures design, the independent variable of before and after involvement in extensive acute care Sim-IPE has been measured in relation to the dependent variable of attitudes of health profession faculty. The dependent and predictor variables have been measured by the Attitudes Toward Interprofessional Education Scale (AIPE) and the Attitudes Toward Health Care Teams Scale (ATCHT). The health profession faculty participants were from a moderate sized, southeastern university with a college of health sciences, including over 20 programs in healthcare professions, exclusive of medicine.

Significance of the Study

Following the mandates by the WHO (2010) and then the IPEC Expert Panel (2011), IPE competency requirements have increased in accreditation standards (Stoddard et al., 2019). Many sources have noted barriers to IPE, such as resources, administrative support, scheduling

conflicts, and student outcome measurements; however, a barrier that has been only partially explored is faculty attitudes and perceptions (Curran, Sharpe, & Forristall, 2007; Johnson, Lynch, Lockeman, & Dow, 2015). Student perceptions and attitudes have been shown to improve with experience in Sim-IPE as well as other experiential IPE events (Khan, Shahnaz, & Gomathi, 2016). Guidance from involved and engaged faculty has promoted this learning (Johnson et al., 2015).

Previous studies examining faculty attitudes have shown a reliable baseline in values. Unlike student studies, only cross-sectional analysis of faculty perceptions and attitudes have been published. Researchers publishing studies involving students have seen variations in attitudes toward teamwork, collaboration, and interprofessional practice at various stages within an educational program as well as variation when exposed to actual IPE experiences, including simulation-based IPE (Aleshire, Dampier, & Woltenberg, 2018; Liaw et al., 2014). Gary et al. (2018) and Hinderer et al. (2016), researched faculty baseline attitudes towards teamwork, collaboration, and interprofessional practice in students and healthcare professions. Steinert (2005) have examined the role of faculty development on attitudes of faculty . Other researchers have shown mixed reports of attitudes towards interprofessional education. While means are more positive than negative, truly positive values are higher in females (Al-Qahtani & Guraya, 2016) and in nursing faculty (Gary et al., 2018).

Even with baseline means of agreement with statements of benefits of interprofessional education, opportunity remains to improve scale scores. As the emphasis for IPE continues, helping faculty involved in simulation and administration better understand how health profession faculty perceive IPE and what can be done to improve the process has been beneficial. Gaining information regarding changes in faculty attitudes surrounding involvement in actual

IPE experiences may provide the information necessary to direct further IPE efforts. Grymonpre (2016) cited faculty development as a means to improve faculty engagement in IPE. This study proposed to provide results to enhance faculty development specific to simulation-based IPE.

Faculty examined within this study were from a non-medical college of health sciences. The simulation-based scenario was acute-care based and reflections can be tailored to similar situations in health profession education. Faculty were considered for previous IPE experience and can be generalized to similar faculty composition in other colleges with health profession programs. As many universities have either one or more of the disciplines involved, the study will serve as a foundation to simulation-based interprofessional education in a large-scale, hospital-based scenario.

This researcher sought to recognize the variations in attitudes towards health care teams and attitudes towards interprofessional education of healthcare faculty with differing levels of previous IPE involvement after participating in a large scale, simulation-based interprofessional education experience. The introductory nature of this inquiry is necessitated by the current gap in literature regarding faculty attitudes in reference to involvement in multidisciplinary Sim-IPE. Information gained can provide direction and reference for faculty development within IPE directly related to use of simulation-based education in IPE. This researcher proposed further consideration of variation in pre- and post-test scores using validated tools to determine the extent of change in attitudes of faculty when participating in the implementation of a Sim-IPE.

Research Questions

Consideration of the potential relationship between faculty attitudes to IPE and the student learning outcomes in IPE brought the researcher to contemplate the following questions.

RQ1: Is there a relationship between previous years of experience in IPE and faculty

attitudes towards interprofessional education following a Sim-IPE?

RQ2: Is there a relationship between previous years of experience in IPE and faculty attitudes toward health care teams following a Sim-IPE?

RQ3: Is there a difference in faculty attitudes towards interprofessional education before and after involvement in Sim-IPE?

RQ4: Is there a difference in faculty attitudes toward health care teams before and after involvement in Sim-IPE?

Definitions

1. *Attitude* – a person's viewpoint and perspective relating to a situation (Makino et al., 2018)
2. *Collaborative practice* – occurs in health care when "multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, caregivers and communities to deliver the highest quality of care across settings" (WHO, 2010, p. 13)
3. *Fidelity (in simulation)* – "the degree to which the simulation replicates the real event and/or workplace; this includes physical, psychological, and environmental elements" (Lioce et al., 2020, p. 18)
4. *Healthcare professionals* – "individuals who study, diagnose, treat and prevent human illness, injury and other physical and mental impairments in accordance with the needs of the populations they serve" (WHO, 2010, para 1)
5. *Interprofessional education (IPE)* – "two or more health professions learning about, from, and with each other to enable effective collaboration and improve health outcomes" (World Health Organization, 2010, p. 7)

6. *Paired samples t-test* – statistical test "to compare means for groups of scores that are obtained by making repeated measurements" (Warner, 2013, p. 965)
7. *Repeated measures design* – research design to measure a single group of participants at intervals in which an intervention is interjected in between at least one interval (Gall, Gall, & Borg, 2007)
8. *Simulated person (SP)* – a person who portrays a role to meet the objectives of a simulation; also be referred to as a standardized patient/family/healthcare provider if "formally trained to act as real patients in order to simulate a set of symptoms or problems used for healthcare education, evaluation, and research" (Lioce et al., 2020, p. 43)
9. *Simulation* – "a technique that creates a situation or environment to allow persons to experience a representation of a real event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions" (Lioce et al., 2020, p. 44)
10. *Simulation-based Interprofessional Education (Sim-IPE)* – "health care workers from different professions working together using a near representation of an actual patient care simulation" (Failla & Macauley, 2014, p. 576)
11. *Simulator* – "Any object or representation used during training or assessment that behaves or operates like a given system and responds to the user's actions" (Lioce et al., 2020, p. 48)
12. *Spearman's Rank Order Correlation* – nonparametric statistical test to determine the correlation of means between an ordinal criterion variable and an interval predictor variable (Warner, 2013)

13. *Virtual reality simulation* – "simulations that use a variety of immersive, highly visual, 3D characteristics to replicate real-life situations and/or healthcare procedures;" distinguished from computer-based simulation by generally incorporating physical or other interfaces, i.e. computer keyboard, "mouse, speech and voice recognition, motion sensors, or haptic devices" (Lioce et al., 2020, p. 54)

CHAPTER TWO: LITERATURE REVIEW

Overview

In this study the researcher focused on faculty perceptions in consideration of a large-scale, simulation-based interprofessional education (Sim-IPE) event. In order to provide a complete background, the narrative of the literature review will reflect the research available to the point of the publication of this dissertation regarding Sim-IPE and its dependence on faculty engagement. The introduction will provide understanding of the flow of the review. The theoretical framework will outline previous learning theories that define simulation-based education. Further, the review of literature will discuss interprofessional education (IPE), health care education standards, simulation-based education, simulation in IPE, tools for simulation-based IPE assessment, student responses to IPE, and faculty responses to IPE.

Introduction

IPE and collaborative practice are buzz words in the healthcare field. As medical errors have risen and complexity of cases increased, the need for collaborative practice also increases. Collaborative practice allows professionals from multiple healthcare disciplines to look at all potential interactions and complications within the various body systems in treating complex diseases and illnesses. Health care professionals can reduce medical errors and improve patient outcomes through collaborative efforts that enable multiple levels of validation of interventions and diagnosis (Greiner, Knebel, & Institute of Medicine [IOM], 2003). The condition remains that most professions were not trained, originally, to understand and appreciate the roles and responsibilities of other professions, therefore enhancing the need for continuing education and training in interprofessional collaborative practice.

Students in health profession programs provide a unique base to engage in the practice of

interprofessional collaboration. IPE is defined with two or more professions learning together, and interprofessional practice (IPP) is further defined as working together to provide appropriate care for patients (World Health Organization [WHO], 2010). Providing avenues for IPE in health profession education programs can enable students to have a firm foundation in appropriate patient-centered care, safety, and medical error reduction. The core concepts of both IPE and practice are teamwork, communication, values and ethics, and roles and responsibilities (Interprofessional Education Collaborative [IPEC], 2016).

Providing students opportunities to learn inter-professionally and to understand the model of teamwork, communication, collaboration, and respect for other professionals is increasingly important in health profession education (IPEC, 2016). Simulation-based IPE (Sim-IPE) provides a forum for active experimentation of collaborative practice among health profession students of varying disciplines. The theoretical framework for Sim-IPE involves experiential learning founded in experiences, reflection, evaluation, and further experimentation. The foundations of simulation-based IPE derive from the foundations of IPE, simulation in health profession education, and the connection between Sim-IPE. The ability to progress Sim-IPE has been defined utilizing various assessment tools by their applicability to student learning, as seen in student perceptions, and to faculty's ability to adopt Sim-IPE as seen in faculty perceptions.

Theoretical Framework

Experiential learning theory framed this study. Experiential education has been described as following four phases of learning: concrete experience; reflective observation; abstract conceptualization; and active experimentation (DeCaporale-Ryan, Dadiz, & Peyre, 2016). This theory of experiential learning was first introduced by Kolb in 1984 and was developed following the theories of John Dewey, Kurt Lewin, and Jean Piaget (Kolb, 2015). Experiential

learning theory provides an avenue for educators to explore this relationship between knowledge and application. Health profession education maintains an expectation that students will graduate prepared to take their place in the work force directly following credentialing. Employers have responded, emphasizing the need to bridge the theory-practice gap and allow students to apply knowledge gained in traditionally didactic coursework in real world scenarios to grow their understanding of practice (Hill, 2017).

Experiential education is, at its core, learner-centered education. Experiential education holds foundation in the changing views of social and cultural experiences and how they influence assimilation and application of knowledge. Early learning understanding included Aristotle's empiricist beliefs of knowledge coming from the surrounding environment. Schunk (2016) further developed into learning theories highly influenced by the way individuals both learn from their environment and utilize their knowledge to interact with the environment. Following initial empiricist understanding, various social learning philosophers and theorists paved the way to understanding experiential learning. Most notably, John Dewey's pragmatist approach, Kurt Lewin's reflective theory, and Jean Piaget's constructivist cognitive development all provided background for experiential learning theory, as currently known and described by David Kolb.

Dewey

A pragmatist who credited acquisition of knowledge with the experiences that surrounded the introduction and application of the information presented, John Dewey is one of the founders of experiential learning (Knight, 2006). The ability to formalize learning in the context of the experience is tied the learner's reflection on the experience. Dewey viewed intellectual gains as those cognitive functions enforced through problem solving in relation to experiences of the learner. The pragmatist's educational philosophy involves students engaging in concrete

experiences for concept introduction and allows further scenarios to utilize new information as applicable knowledge.

Experiential education, according to Dewey, allows a student to take traditional learning to a level that will allow challenge and interpretation, which can change and adapt to future environments (Kolb & Kolb, 2017). A key to this learning was time to reflect on the experience, providing intellectual musings on future application of the knowledge gained. Dewey's theory was rooted in situational learning, guiding students to accept and assimilate constructs as they fit into presented scenarios and problems (Parkay, Anctil, & Hass, 2014). Dewey concluded that students provided with an experience and time for self and guided reflection provided an avenue to further self-understanding of behavior and response.

Dewey related much of his philosophy to the elementary and secondary school levels, while later writing and engagements suggest an elevation of theory to higher education. Dewey challenged institutions of higher education to engage students in deeper understanding of the world and to create meaningful change through research and applications that influenced and molded conceptualization of meaning and purpose (Stoller, 2018). Engagement of students' interest and cultivation of their ability to experience, examine, and apply knowledge gained are the tenants of Dewey's goals for higher education curriculum. Higher education strives to produce meaningful change through new structures to react to changing social environments. Students can enact this change through study and adaptions due to experiences in the current environment.

Lewin

Known for contributions to education through leadership style, mathematical problem solving and group work construction, Kurt Lewin has been a pioneer for reflective, social

learning, which also contributed background to experiential learning theory. "The consistent theme in all Lewin's work was his concern for the integration of theory and practice" (Kolb, 2015, p. 9). His experimentation in group learning led to discoveries of the benefits of reflection and debriefing post experience. Lewin began engaging participants in a post-experience, active, guided reflection and discussion of the event. Discovered within this added element of experiential learning was the ability to dissect the experience from varying points of view to allow all participants to understand emotions and considerations of others also involved in the experience. This reflection and debriefing permits learners the ability to change their knowledge of the situation and its solutions to best reflect all individuals involved.

Field theory is what is now considered Lewin's philosophy of learning. A status of knowledge and attitudes is altered and changed as forces are put on the individual's equilibrium (Wheeler, 2008). In order to modify behavior, the environment must be created to provide an experience and a reflection that will provide changes to previous behavior in line with the objectives. Alterations in equilibrium will influence learners to find a means to stabilize the environment In which they are learning. Subsequent experimentation in group dynamics provided further reference to Lewin's theory, which acquired knowledge and behavior can be influenced by tailored experiences and guided reflection that embeds objectives within the mind of the learner.

Lewin based adaptions to behavior and understanding on an inherent desire to obtain equilibrium (Burnes & Bargal, 2017). Individuals and groups change behavior based on those environmental constructs that influence previous responses to an experience. Environmental obstacles that either inhibit behavior or encourage behavior are synthesized into the previous experience and behavior is adapted to fit. Previously learned response is unfrozen, adaptions are

attempted, examined, and evaluated. Finally, the outcome is realized and behaviors that work are refrozen in the subconscious to be utilized at next occurrence (Schein, 1999). In a group setting, this process can be reflected upon and analyzed using multiple fields of view.

Piaget

Jean Piaget, who contributed background to experiential learning theory along with Dewey and Lewin, viewed cognitive development in light of maturity in both physical and social experiences (Schunk, 2016). Within this developmental philosophy, children's learning changes both by internal development and by the experiences they are exposed to. Critical thinking would then attract previous learned concepts as well as newly presented material into problem solving of situations that are to be imagined or felt. The underlying principle to knowledge acquisition and understanding is structured engagement of preceding development. New knowledge and understanding must be built on existing knowledge, and critical thinking can be accessed through engagement that encourages the learner to reflect upon earlier understanding.

Piaget's merger of development of appropriate learning as defined by experiences felt, perceived, or explained is vital to experiential learning's footprint. At the time of Piaget's initial research, standardized testing and traditional teaching reigned, and his ideas of situational learning were in stark contrast to traditional, conceptual learning (Kolb, 2015). His work, though taking time to root itself in educational philosophies, paved the way to utilizing experience-based education specific to cognitive developmental stages for curriculum development. Piaget grounded his work in the understanding that experiences modified behavior through an individual's mental organization of the consideration of outcomes (Dongo-Montoya, 2018). Providing structured, objective-based opportunities for information utilization allows students to grow in their understanding and provide ability to draw upon previous experiences when new

opportunities present themselves.

Further work by Piaget was rooted in constructivist philosophy. Piaget closely examined the role of the social environment's influence on learning and development (Dongo-Montoya, 2018). Consideration of social influence allows students to utilize previous understanding and knowledge in new context based on peer emphasis. Allowing students to work in group settings, Piaget found students used group knowledge and influence to emphasize importance of certain skills and behaviors. Assimilation of new knowledge in experiences or in interactions provided an additional level or schema to the information base of students (Bormanaki & Khoshhal, 2017). This scaffolding of information allowed the student to accommodate behaviors and responses to the environment in new experiences and uses of knowledge.

Kolb

Experiential "learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 2015, p. 49). Building on the philosophies and theories as such influential individuals as Dewey, Lewin, Piaget, Follet, Jung, and others, David Kolb designed the experiential learning theory and released his first comprehensive book definition in 1964. Kolb's more recent release of his revised second edition of the experiential learning theory provides his initial insight and direction as well as additional research, use, and reflection in regard to learning cycle, learning style, and the associated Learning Style Inventory (LSI) that he has found in the 30-year interim. Experiential learning, as defined by Kolb, has been utilized in health profession education programs to provide application and development of knowledge, skills, and abilities specific to those professions that provide health care (DeCaporale-Ryan et al., 2016; Hill, 2017; Kolb & Kolb, 2017).

When considering experiential learning theory in practice, all phases of knowledge

acquisition must be present. Using objectives, an experience is designed by faculty to meet the objectives. In simulation, a scenario with enough depth to allow students to meet skill, communication, and critical thinking objectives is designed (Nunes de Oliveira et al., 2015). The experience is implemented and students are facilitated to engage appropriate to the objectives. Following the experience, self, group, observer, and peer reflection are facilitated to engage the learner in understanding what new knowledge was gained in the experience. This information is further evaluated to determine if future interactions with similar experiences should be responded to the same or what variance should be employed (Wang & Zorek, 2016). Future experiences, whether intentional through designed scenarios or within clinical experiences, should be considered with the same reflection, evaluation, and adaptions to response.

Educators in higher education are utilizing experiential learning theory and its minor constructs to provide an opportunity for students to gain further depth of knowledge. Guided by the theories and research of those philosophers and scientists, Dewey, Lewin, and Piaget, David Kolb (2015) has made a well-defined structure and process. Educators can utilize experiential learning theory in all phases to allow student application of knowledge, skills, and abilities while in school to prepare them for utilization and growth of knowledge in the future practice setting. As health profession education continues to grow as an interdisciplinary study, patients are benefitting from the impact of this education as graduates move into the professional roles. The graduates are able to understand the process of retention, retrieval, and application of knowledge through guided experiences in school, which will help guide them in the practical setting (Risling-de Jong, Styron, & Styron, 2016).

Related Literature

Utilizing a framework of experiential learning, simulation provides an avenue for student

learning that enables experience, guided reflection, evaluation, and considerations for reapplication. Experiential learning theory underpins the design and implementation of simulation-based health profession learning. Further consideration of team-based learning is essential to IPP as defined within the framework provided by the WHO (2010) and further by the IPEC (2016). Team-based practice, understanding of roles and responsibilities, and communication form the essential intentions of both experiential learning and interprofessional education.

Health profession education must prepare learners for patient-centered care in the work force (WHO, 2010). A patient is a complicated individual with complex causes to illness, injury, health, and overall wellbeing. Serving the human population increasingly requires health professionals to communicate with each other with respect and understanding of each profession's roles and responsibilities (Committee on Quality of Health Care in America, 2001). Preparation of health professionals must include similar constructs to ensure future professionals are able to provide collaborative, patient-centered care. Faculty are then tasked with development of curriculum, courses, objectives, events, and experiences that will facilitate development of this important skill in all health professional students.

Consideration of attitudes to IPE of faculty is multifaceted as it is with students. Scales used to determine attitudes must assess correlations to previous experience as well as impact of involvement in simulation-based IPE. In the resultant discussion, both simulation-based healthcare education and IPE will be defined to better identify faculty attitudes towards IPE utilizing a simulation-based experience requires. Assessment of Sim-IPE range in relation to the desired outcomes of the event, so tools used to define understanding will be examined. Further, student response to simulation-based health profession education and IPE is important to provide

a basis for use of simulation in interprofessional education. Research has shown the evidence of negative faculty attitude and perception of IPE as a barrier to creation of IPE and student learning and this attitude impact should be further explored (Gardner, Chamberlin, & Stowe, 2002; Hoffman & Redman-Bentley, 2012). Further exploration of faculty attitudes to interprofessional education and their potential impact on student learning in health profession programs will be explored, in this review of literature and in this study.

Simulation-Based Education

Simulation-based education is firmly rooted in experiential learning theory (Kolb, D. A., 2015). Providing a learner an experience guided by learning objectives, ability to react, reflection in debriefing, and an opportunity to utilize knowledge either in future simulations or in clinical practice provides a unique, fluid, and interactive learning environment (Sweigart et al., 2016). Simulation-based training as a form of experiential education requires faculty to determine learning objectives and design a scenario or lab that will promote those objectives. High-fidelity simulation-based training further promotes use of critical thinking as more than rote skills are required both to navigate the scenario and then to debrief on the outcomes to understand the best practice for future situations (Dennis, Furness, Duggan, & Critchett, 2017).

Recognition of the complexity of simulation-based education has led some of the larger medical education associations to publish additional guidelines. The Association for Medical Education in Europe provided the best evidence-based practical guide to simulation in health care education in 2013. Identification of outcomes and objectives is identified as of paramount importance to the design of simulation (Motola, Devine, Chung, Sullivan, & Issenberg, 2013). This carries over to all forms of educational programs in experiential learning. Also identified as high priority is curricular integration. Not all curricular goals fit simulation activities. Faculty

should fully develop objectives to determine the course and direction of programs.

Simulations vary as an experiential learning mode. Determining the appropriate medium, modality, instructional method, and presentation take care and deliberation (Chiniara et al., 2013). When considering simulation for health care education, instructional design is a daunting task that can be improved with guidelines and well researched directives. Chiniara et al. (2013) provided a framework that gives educators an opportunity to consider the various forms of simulation and use a conceptual approach to design. Simulation-based education encompasses experiential education at the lowest fidelity level of skill acquisition in a repeated practice with feedback (Dennis et al., 2017). Higher fidelity simulation allows further development of skills in complex patterns that require recall and manipulation to manage whole system and environmental effects as well. Making a complete learning environment requires additional consideration of guided reflection in debriefing focusing on learning objectives (DeCaporale-Ryan et al., 2016).

Interprofessional Education

the IOM 2001 report *Quality Chasms* addressed quality care of patients with complex and/or chronic illnesses as requiring interdisciplinary teams (Committee on Quality of Health Care in America, 2001). The IOM found interdisciplinary teams with effective communication, appropriate collaboration in findings, and a team atmosphere in treatment aided patients in transitioning levels of care and in managing complex cases. The evidence and emphasis provided in the Greiner et al. (2003) subsequent report regarding education of health professions began to give direction to the development of education programs for students seeking entry in to health professions. Most patients with chronic conditions benefitted from the combined expertise of professionals in multiple fields such as nutrition, social work, general medicine,

exercise physiology, internal medicine, rehabilitation, and others. The defining characteristic noted by the IOM included collaboration of the various clinicians to ensure all aspects of health and wellness are considered and addressed in the plan of care.

The WHO has spent considerable time and effort in reviewing effectiveness of interdisciplinary practice. The WHO (2010) has described and recommended health profession education include interprofessional education to provide "development of a 'collaborative practice-ready' health workforce" (p. 13). Patient-centered practice requires collaboration of various health professionals to be able to provide care to the entire individual to reduce medical errors and misdiagnoses. The IPEC was created to further define and detail instruction in IPE following the initial framework provided by the IOM in 2003 (IPEC Expert Panel, 2011). The core competencies developed in 2011 and reviewed in 2016 postulated the need for health professional students to learn skills in collaboration and team-based practice in order to understand, appreciate, and be able to apply the same in their future practice.

In a review of studies on interprofessional education, Herath et al. (2017) noted the benefits of interdisciplinary practice and collaboration were again affirmed. Nursing and medical students have found increased understanding and appreciations for the roles and responsibilities of professions with which they work in simulation (Fewster-Thuente, 2014; Liaw, Siau, Zhou, & Lau, 2014). Additionally, communication, professional understanding, and respect for other health professions was noted in IPE research using low fidelity simulation, case studies, and didactic courses (Friend, Friend, Ford, & Ewell, 2016; Jutte, Browne, & Reynolds, 2016). More recent studies in IPE have shown that students process change with IPE experiences on more consistent intervals throughout the curriculum. Olson and Brosnan (2017) reported students in a 2-year longitudinal study to begin to consider incorporating care of other

professions in plan of care as well as in decision making process.

IPE is proposed to link to IPP. For IPE to be successful, students should feel prepared to work in interprofessional teams in later practice settings. Cross-sectional studies of students in various health professions have been considered for readiness for interprofessional practice (as opposed to interprofessional learning). Sevin et al. (2015) studied students in three different universities and discovered a statistically positive correlation between previous IPE experience and perceived preparedness for interprofessional practice. Makino et al. (2018) also reported a cross-sectional study of two universities, one that incorporates IPE into their curriculum and one that does not. Makino et al. found the students with previous IPE experience have statistically more positive attitudes towards working in health care teams. Identifying students' apparent increases in readiness for IPP can bolster the use of IPE in preparing students for patient-centered collaborative practice.

IPE faces a number of barriers. A primary barrier was finding appropriate equivalent levels of education of students, faculty availability, facilities, and administrative support (DeCaporale-Ryan et al., 2016; Fewster-Thuente, 2014; Herath et al., 2017). Organization of time with faculty from all disciplines before the event for planning, coordination of student schedules, and division of resource cost can be impediments in educational programs (Jones, Schuer, Taylor, Zephyr, & Jones, 2015). A well-developed yearly Sim-IPE with nursing and medical students is noted to take significant time and effort of the faculty, but has shown each time to be worthwhile to the students (Horsley et al., 2016). While Horsley et al. (2016) found the benefits to interprofessional education across all studies outweighed the limitations, they also noted further studies on perceptions of interprofessional education are needed to discover how to further improve upon this manner of learning.

West et al. (2016) surveyed multiple medical schools and found faculty development and faculty commitment as limiting factors to IPE in most schools. A majority of the institutions surveyed had current IPE practices. A primary characteristic in successful IPE was the importance of faculty understanding of implementation of objectives of IPE such as team building and communication. While barriers in IPE remain, researchers observed training in IPE and use of validated evaluation tools provided structure and guidance to faculty. In 2018, Coleman described a program that trained educators prior to working with students in defined IPE experiences. The educators reportedly benefited from development in the process of IPE implementation as well as experiences working in interdisciplinary teams to develop IPE experiences for their students (Coleman, 2018). Providing direction, support, and assistance to faculty is a firm basis in enhancing development of IPE experiences for health profession students.

Health Care Education Standards

Nursing and medical education have led the charge following the WHO and then the American Medical Association mandates for patient-centered care that revolves around appropriate interprofessional discourse and begins with interprofessional education (International Association for Clinical Simulation and Learning [INACSL] Standards Committee, 2016). The IPEC (2016) that provided the initial core competencies was constructed of nursing, medicine, pharmacy, public health, and dentistry. Within nursing, the National League of Nursing supports IPE, and the International Nursing Association for Clinical Simulation and Learning (INACSL) has further described the effect and requirements of simulation-based learning within interprofessional education (INACSL Standards Committee, 2016). The International Association for Medical Education also included a separate section in their guide for simulation-

based medical education specific to team-based training (Motola et al., 2013).

Representatives for the American Association of Colleges of Nursing, the American Association of Colleges of Osteopathic Medicine, the American Association of Colleges of Pharmacy, the American Dental Education Association, the Association of Medical Colleges, and the Association of Schools of Public Health developed the IPEC to further the design of interprofessional education standards. The Core Competencies for Interprofessional Collaborative Practice was released in 2011 with specific advice in structuring IPE within higher education (IPEC Expert Panel, 2011). This document furthered the standard set forth in nursing to broaden to practices required by medical, nursing, dentistry, pharmacy, and public health programs.

A systematic review of U.S. accreditation documentation in 2013 revealed the beginnings of implementation of accreditation standards referencing IPE (Zorek & Raehl, 2013). In this analysis, medicine, dentistry, and occupational therapy each had one accountable standard for IPE, while physical therapy, physician assistant studies, public health had between two and four accountable standards regarding IPE. Pharmacy's newest accreditation guidelines had the most accountable standards regarding IPE. In nursing, those guidelines provided by the Commission on Collegiate Nursing Education included three to 13 accountable standards to IPE, dependent on level of degree to be obtained within nursing. However, their additional accrediting body, the National League of Nursing, had no accountable standards (Zorek & Raehl, 2013). Additionally, most programs' accreditation standards did not align with other disciplines standards. As most IPE is conducted with multiple disciplines, variations in standards can create a barrier to objective development for activities. Utilizing objectives that span all disciplines, such as those detailed by IPEC, multiple programs can successfully design events to meet the demands of

collaborative care (IPEC, 2016). While the IPEC considerations were beginning to be implemented in U.S., other countries have similar organizations to influence adoption of similar language within accreditation standards focusing on IPE.

In 2014 the original bodies of the IPEC took another step toward coordination of health profession education. The Health Profession Accreditation Collaborative (HPAC) was formed with the accrediting bodies for medicine (LCME), nursing (CCNE), pharmacy (ACPE), dentistry (CODA), public health (CEPH), and osteopathic medicine (COCA). The goal of the group was to prepare graduates for collaborative practice through accreditation standards (IPEC, 2016). The HPAC has since added 17 additional accrediting bodies to work together to formulate an educational framework and expectation for IPE (Skelton, 2017). Development of this community has provided an avenue for discussion of combined competencies for all health professions and many are adopting these competencies within health profession education.

Formulation of standards provides a basis for objectives for curriculum; however, assessment is necessary to understand if learning objective have been met. Formative assessment of IPE standards is still in development. Multiple authors have reported the lack of one specific tool that identifies learner development of IPE objectives (Shrader, Farland, Danielson, Sicat, & Umland, 2017; Thistlethwaite, 2016). Rogers et al. (2017) noted consideration of development of assessments that can span the disciplines and be considered in accreditation documentation. In consideration of the WHO directives for development of a collaborative-ready work force, the Ottawa conference in 2016 provided an avenue for development of global assessments that complement the IPEC core competencies, as well as those of the Interprofessional Capability Framework favored by the UK, the National Interprofessional Competency Framework used by Canada, and the Interprofessional Capability

Framework used by Australia. Patient-centered care being at the center, assessments were designed to measure students learning in safety, communication, and teamwork as well as defining levels of knowledge.

Simulation in Interprofessional Education

IPE began primarily with focus groups and case study discussions, so true collaborative practice was limited to the theoretical study of patient care (Palaganas, Epps, & Raemer, 2014). With use of simulation in IPE, the students were able to collaborate both through communication and through action. Immersing the students within a realistic clinical environment allowed all professions involved to approach, address, and adjust to the changing facets of working with a patient as well as with other health care providers. Palaganas et al. (2014) also addressed the very specific consideration in Sim-IPE that is debriefing. This phase of the experience allows the transfer of learning from the managed to the understood theories and acts within the conscious mind.

Best practices in simulation-based healthcare education require faculty designing and implementing the experience beginning with outlining objectives (Motola et al., 2013). A scenario, case study, set of skills, or other experiential event is then designed to allow students to meet the learning objectives. Scenarios decided upon must be reevaluated throughout the planning process to ensure objectives are still being met. Implementation of the simulation experience requires forethought into required equipment, documentation, consumable resources, faculty resources, and student preparation (Chiniara et al., 2013). For enhanced reality or fidelity of simulation, resources must be fully considered and prepared to allow students to immerse themselves in the simulation and suspend disbelief.

Included in the planning and implementation process is consideration of development of

both pre-event briefing of students and post-event debriefing of students and/or self-reflections on the process. Pre-briefing should include orientation, expectations, and feedback preparation (Motola et al., 2013). Debriefing and feedback can be utilized during the simulation or following the simulation. Debriefing allows objectives to be reinforced and understanding of concepts desired within the simulation clarified. Finally, the simulation should be evaluated by faculty and students so adjustments can be made to future events based on the experiences gained.

When incorporating simulation-based education into IPE, additional considerations must be met. Objectives move from individual discipline tasks to group tasks achieved collaboratively or to communication alone (IPEC, 2016). Faculty from each discipline involved must have a voice in the development of scenarios to ensure validity of the case. Faculty from all disciplines involved must also be able to commit additional faculty and student resources in time and preparation. Administrative support is essential for funding, space, and time availability for all departments involved (INACSL Standards Committee, 2016). Evaluations should measure objectives that transpose all professions involved in the simulation, and refining of future events should identify needs according to interprofessional objectives.

Simulation in IPE has been evaluated and studied for achievement of IPEC competencies. Using the Readiness for Interprofessional Learning Scale (RIPLS), researchers have created pre- and post-IPE event experiments to determine the perceptions of students regarding what they learned in the experience (Abramoff, 2013; Judge et al., 2015; Wilcox, Miller-Cribbs, Kientz, Carlson, & DeShea, 2017). The researchers reaffirmed the benefits of simulation in promoting interprofessional discourse and improved understanding of interdisciplinary roles. Murphy and Nimmagadda (2015) found significant improvements in attitudes and perceptions of roles within both student groups following the Sim-IPE. Providing a mechanism for students to practice

communication and collaboration has proven to be an effective form of advancement for respect and understanding of other professions.

Paige, Garbee, Brown, and Rojas (2015), authors of a Sim-IPE within surgical patient care, noted that this can be a "powerful educational tool permitting the acquisition of KSAs [knowledge, skills, and abilities] . . . in a safe, nonthreatening learning environment at no risk to a patient" (p. 752). Paige et al. cited numerous studies reporting improved patient outcomes with less medical errors when interprofessional education interventions are used in the health care setting. Paige et al. noted the limitations to such a task similar to other studies, such as matching learners, addressing attitudes of faculty and administration, and identifying appropriate matching outcomes and curriculum goals. One of the six primary focuses Paige et al. identified to addressing these concerns was to gain commitment from the faculty. In a study of a Sim-IPE curriculum with nursing and medical students, the immense need for the faculty to work collaboratively and extensively with the students is both perceived as a challenge but a surmountable obstacle (Horsley et al., 2016).

Tools for Assessment of Simulation-Based Interprofessional Education

Evaluations can be open-ended or utilize specific tools that will assess learner knowledge adjustments due to involvement in the simulation. In simulation-based interprofessional education, a number of scales have been examined to address changes in attitudes and behaviors according to the primary goals of IPE. As simulation best practices dictate, objective-driven scenarios and experiences, evaluations should reflect the objectives (Motola et al., 2013). Available tools for Sim-IPE focus on one or more of the IPEC considerations, which included interprofessional communication, roles and responsibilities for collaborative practice, values and ethics for interprofessional practice, and teamwork and team-based practice guide the objectives

of Sim-IPE.

Some of the available assessments are limited due to the programs they highlight, such as provider-practitioner relationships. In a scenario with no provider role, such as nursing working with physical therapy, questions based on the communication between a provider and a practitioner would not be appropriate to the objectives of the simulation. However, despite these program specific considerations, a few validated assessment tools directly for Sim-IPE are available (Havyer et al., 2016; Shrader et al., 2017). While not an exhaustive list, the Interprofessional Attitudes Scale (IPAS), the RIPLS, TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ), Attitudes Toward Health Care Teams Scale (ATHCT), Student Perceptions of Physician-Pharmacist Interprofessional Clinical Education-Revised (SPICE-R), and Individual Teamwork Observation and Feedback Tool (iTOFT) all are validated, can be used with multiple health care professions, and identify one or more of the IPEC competencies.

The RIPLS was originally designed and tested by Parsell and Bligh in 1999, the same year as the initial report of the IOM, prior to the IOM white paper in 2001, the WHO mandates in 2010, and the IPEC initial competencies in 2011 or the revisions in 2016. The scales were designed to begin to measure relationships, collaboration and teamwork, roles and responsibilities, and patient-care implications (Parsell & Bligh, 1999). Initial tests were run with eight health professions. While acutely used within interprofessional education, concerns of internal validity surfaced and some researchers have developed more reliable subscales (McFayden et al., 2005) or variations to full use (Kerry, Wang, & Bai, 2018). Still readily used to assess multiple disciplines within health care professions, the revisions of the RIPLS are on the rise to assess changes in attitudes of students in health care professions (Mahler, Berger, & Reeves, 2015).

Faculty attitudes often relate more directly to the perception of their students' readiness for learning. In 2007, Curran, Sharpe, and Forristall adapted the wording of the original RIPLS for use with faculty. Internal validity in the researchers' original article was reportedly effective. Further testing utilizing the adapted scale has presented consistent validity and reliability ratings (Gary, Gosselin, & Bentley, 2018; Olenick & Allen, 2013). Use of the adapted subscale for faculty has provided a means to begin to determine the underlying beliefs of the educators responsible for development and implementation of IPE curriculum. The adapted scale is now considered the Attitudes Towards Interprofessional Education (AIPE) (Curran et al., 2007).

In 1999 Heinemann, Schmitt, Farrell, and Brallier also sought to identify attitudes of individuals involved in interprofessional practice as well as in interprofessional education. The development of the ATHCT provided measurements to help guide the enlightening concerns regarding collaboration and teamwork among health care professionals to improve patient outcomes (Heinemann et al., 1999). Primary importance in the scale was its ability to measure attitudes of multiple professions within healthcare as opposed to previous scales that separated attitudes for physicians and nurses. Further validation by outside groups when used in the educational setting provided strong reliability and internal validity (Hyer, Fairchild, Abraham, Mezey, & Fulmer, 2000). The original scale denotes physicians as the lead in health care teams. However, modification in 2007 by Curran et al. removed this language to make the scale more potable for other possible providers. Validity of the modified scale has been noted and retested to provide adequate reliability (Curran et al., 2007; Makino et al., 2018).

While other scales are available and utilized widely for assessment of student attitudes and perceptions, those adapted by Curran et al. (2007) provide the basis for quantitative study of faculty response. Curran et al. provided adaptions and validity testing for the ATHCT, the AIPE,

and the Attitudes Towards Interprofessional Learning in the Academic Setting (AILAS). The AILAS was originally developed by Gardner et al. in 2002 to provide information regarding perceived barriers to interprofessional education by health care administrators. Curran et al. utilized the scale to address faculty throughout health profession education, which has been further explored by Casa-Levine (2017), Gary et al. (2018), and Olenick and Allen (2013). The internal validity of the AILAS has been reported by each as somewhat lower than those of the AIPE and the ATHCT.

Student Response to Interprofessional Education

Increased awareness of the roles and responsibilities of other health professions is the one of the primary reasons for IPE. Lines of communication cannot be effectively increased without appreciation for each other's professional responsibilities. This appreciation can then further develop into greater learning of skills to work collaboratively with other health care providers. However, the question has been asked to determine if this appreciation is happening in health professions students. Jutte, Brown, and Reynolds (2016) addressed this question in a study designed to find perceptions of allied health and nursing students. Following the project-based IPE course, students' attitudes as well as understanding reportedly increased for both health profession student populations involved. Even working within a virtual environment, students' perceptions of other professions, interdisciplinary communication, and teamwork improved before and after Sim-IPE experiences (Sweigart et al., 2016). TeamSTEPPS is a program developed to increase communication and decrease medical errors caused by miscommunications. Using this design, the students were able to reportedly increase teamwork attitudes using virtual reality simulation.

When creating a high-fidelity IPE with further guidance within the simulation, King,

Szczerba, Rega, and Peeters (2014) also found improved perceptions of students regarding the other professions involved. King et al. utilized the unmodified RIPLS to find any changes in perceptions and were positively affirmed following an interprofessional simulation experience. King et al. involved simulation with teaching interventions dispersed as needed within the scenario and overall scores improved while maintaining an appropriate internal validity. Studies such as that by Cant, Leech, and Hood (2015) similarly note that involvement in IPE is best addressed throughout the curriculum and ideally beginning early within health profession curriculums using the same scale. Can et al. considered medical students at varying levels of education and found with increased coursework that detailed communication, respect for other professions, and teamwork, scores within the RIPLS increased as well.

Faculty observation of students in a large-scale simulation, Disaster Day, was completed for nursing, pharmacy, physical therapy assistant, emergency medical technician, and radiology students (West et al., 2015). Faculty evaluated the simulation for achievement of IPEC competencies and found the students were able to meet collaborative practice, communication, and teamwork goals of the large-scale simulation experience. In a repetitive standardized emergency response simulation, students from varying health professions were evaluated for teamwork and efficiency of response (Miller, Rambeck, & Snyder, 2014). Students improved response in each repetition as observed by emergency response health professionals. Students also self-reported improvement in team-based scores such as communication, planning, and role definition.

To help with assessing attitudes to health care teams, Heinemann et al. (1999) designed the ATHCT to look at teamwork, communication, and respect in health care teams. This evaluation has been used successfully to consider implications of IPE with students. Friend et al.

(2016) found increased positive perceptions of other health care professions and teams through IPE coursework among medical students using the ATHCT. While medical students' attitudes improved, nursing students' attitudes remained unchanged. Aleshire, Dampier, and Woltenberg (2018) considered nursing students in a single discipline IPE didactic course and saw no changes overall. Variations occurred in specific questions, namely increased perception of the value and accessibility of team communications. Makino et al. (2018) studied students from two universities, one after a year of interprofessional coursework one without. The students all took the ATHCT at the end of the year and the students at the university that provided IPE within their curriculum had higher scores. Further Makino et al. found the regression consistent with earlier studies utilizing the same scale.

Students in courses designed to promote IPP through didactic and problem-based learning in IPE were give the Interprofessional Collaborative Competencies Attainment Survey before and after course completion (Baker & Dunham, 2013). Nursing, pharmacy, and medical students saw improvement after taking the course. The scores coincide with the foundational pillars of IPEC. McBride and Drake (2015) found students learning specific subjects together, including anatomy, also found increased understanding and appreciation for other health professions. In their study, both medical and physician's assistant students reportedly benefited by learning from and with students from other disciplines. Sevin et al. (2015) conducted a large cross-sectional study of three universities and found positive correlation between experience with IPE and perceived readiness for IPP.

Students in other health professions have also been studied in relation to Sim-IPE. In a study looking at team dynamics in an operating room, nursing, medical, and nurse anesthesia students completed pre and post-training teamwork scales using a multistaged, operating room,

high-fidelity simulation (Paige et al., 2015). Students in all disciplines saw improvements in scores relating to teamwork and communication. A Sim-IPE experience was also reviewed between doctor of nursing practice (DNP) students and doctor of pharmacy (PharmD) students (Iverson et al., 2018). Using the SPICE-R and qualitative responses, Iverson et al. found following the simulation, the students reported mostly positive affirmations of understanding of roles and responsibilities as well as appreciation for interprofessional communication and teamwork.

Completing simulation-based training among social work, medical, and pharmacy students provided insight into improvements in energies dedicated to patient-centered therapies (Wharton & Burg, 2017). Students responded positively to team meetings improving understanding and respect for other professions and their roles and responsibilities. Challenges present were a) time to work with the patient for all professions and b) the lack of initial understanding of other professions due to little interaction prior to simulation. Similarly, Wang and Petrini (2017) found medical and nursing students utilizing Sim-IPE improved perceptions of teamwork and respect for professions. Students from both professions left the simulation with a better awareness of the variations in the roles and responsibilities of theirs and the other profession's while reporting greater appreciation for both professions in the health care team.

Faculty Response to Interprofessional Education

Faculty are responsible for conception, development, planning, implementation, and evaluation of IPE events. When the event is simulation-based, significant time is also devoted to collaboration with faculty in various disciplines that will be involved in the Sim-IPE (INACSL Standards Committee, 2016). Time, resources, commitment, and administrative backing can pose barriers to simulation-based training, so faculty perception of students learning outcomes

will often drive their willingness to overcome those barriers. Recent studies have begun to explore the underlying attitudes and perceptions of faculty in regard to interprofessional education and simulation-based education.

Providing opportunities for faculty to learn about IPE with other health profession faculty has had the result of improving attitudes to interprofessional education while revealing underlying factors that are providing barriers to faculty created IPE experiences. Early in the development of IPE, Steinert (2005) addressed the concern of faculty development in IPE as a means to more appropriate delivery of IPE in health profession programs. Over a decade later, the concerns of faculty not surpassing known barriers of IPE including appreciation for and understanding of other disciplines, time commitment to development of activities, and collaboration with faculty from other disciplines still exist. Grymonpre (2016) evaluated faculty development and found existing attitudes to IPE showed statistical improvement in attitudes to teamwork and collaboration following involvement in faculty development on IPE. This study further defined the remaining lack of positive attitudes to IPE in health profession faculty.

Poirier and Wilhelm (2014) put on a seminar regarding interprofessional education for a multidisciplinary health profession educators' audience. Poirier and Wilhelm then surveyed the attendees after the session to find their perceptions of IPE and potentials to begin IPE within their programs. Poirier and Wilhelm noted difficulties within their study were the variations in topics and outcomes that were presented by the different faculty groups. Poirier & Wilhelm reported finding commonalities in curriculum and delivery between professionals with which to conduct an interprofessional education experience for their varied students was difficult. Similarly, Hinderer et al. (2016) found faculty did not feel confident in conducting IPE experiences. Hinderer et al. revealed a number of alarming insufficiencies faculty felt in regards

to IPE. Many faculty felt their own profession was undervalued by faculty in other professions. Additionally, the faculty felt lack of interest in the contributions of their profession by other professions.

Student experiences and learning opportunities drive curriculum and course development. Faculty are attentive to student outcomes and environments that facilitate desired outcomes. Though current trends support interprofessional practice and collaboration, faculty are acutely aware that not all clinical environments foster these relations (Loversidge & Demb, 2015). Faculty desire students to have authentic experiences with other professionals, both licensed and pre-professional, but want a positive reflection to draw on for future interactions. Clinical experiences provide students with opportunities to see patient-outcomes as a direct reflection of the collaboration process and can be hard to imitate in singular, pre-designed events (Joynes, 2018). Debriefing and reflection have then been sought to improve learning experiences in clinical situations involving interprofessional collaboration and practice (IPC). Creating simulation experiences that mimic clinical experiences can provide an additional avenue for positive interprofessional interactions.

In 2002, Gardner et al. specifically surveyed faculty for barriers to IPE. Findings included resources, scheduling conflicts, and administrative support as previously noted. However, another glaring obstacle was faculty perception of value and benefit to IPE, especially enough to outweigh time commitment for creation of experiences. Beck Dallaghan et al. (2016) found continued variation in perceptions and attitudes to various competencies of IPE depending on profession. Despite the mandates from the WHO and various accrediting bodies, concerns remain regarding instituting IPE in health profession education. Public health faculty valued understanding of roles, while medical faculty valued group decision making. Variations in

objectives and lack of understanding across disciplines has been seen as a barrier by other researchers as well (Hinderer et al., 2016). Growing perceptions of lack of positive clinical examples of IPE confronts both faculty and students (Loversidge & Demb, 2015). Providing a positive learning experience in simulation may address that barrier.

Simulation-based education utilizes structured debriefing to reinforce experiential learning theory by allowing guided reflection and abstract conceptualization of the experience students were involved in. Providing a meaningful learning experience requires faculty to adequately prepare for and engage in a structured debriefing session with their students following all simulations. Structured debriefing must be objective-driven and provide targeted feedback to learners (Motola et al., 2013). Creation and implementation of debriefing requires faculty foresight and direct involvement within the simulation experience to provide meaningful respondence and guidance to the learners.

Previous studies have denoted the importance the role of debriefing plays in simulation (Dufrene & Young, 2014; Lyons et al., 2015). In response to previous research, Mariani, Cantrell, and Meakim (2014) sought to discover barriers to simulation by faculty with varied perceptions in debriefing. Debriefing takes time, both in development and in implementation. As such, it was of note to find the debriefing process was at times a barrier to faculty creating simulation experiences for their students (Mariani et al., 2014). However, faculty found that debriefing in simulation led to changes in debriefing in clinical scenarios. The debriefing that occurs in clinical situations involves situational breakdown both amongst professionals and between students and preceptors. Valued preceptors provide additional learning opportunities for student in debriefing situations between patients and clinicians and between clinicians to better explain communication and collaborative efforts (Loversidge & Demb, 2015).

Cross-sectional studies on attitudes of faculty have been delineated by profession, time within profession, age of faculty, faculty role, gender, and prior experience with IPE. Gary et al. (2018) found nursing to have statistically greater attitudes in IPE and teamwork, while other variations did not significantly affect scores. Nursing, pharmacy, medicine, public health, and dentistry were considered in their study. Gender, level of education and previous IPE experience were also considered but no significant differences were noted. Casa-Levine (2017) found a positive correlation between attitudes to IPE and previous level of experience in IPE in dentistry and dental hygienists. Hinderer et al. (2016) found similar correlations that were significant between knowledge and perception as well as between attitude and perception across multiple disciplines, nursing, pharmacy, medical, physical therapy, respiratory therapy, and other allied health professions. However, Hinderer et al. did find a negative correlation between years of practice and interprofessional attitudes.

Al-Qahtani and Guraya (2016) considered gender variation in question analysis of the modified RIPLS responses for faculty in a college of health sciences. Specific to gender the researchers found variation in perception of IPE aiding students in understanding own profession limitations and need for healthcare students to learn together. Overall scores showed increased attitudes of female and older (greater than 41 years of age) faculty. Al-Qahtani and Guraya also took specific items from the modified RIPLS and assessed faculty response. The largest variation was found in the question of student perceived benefit when utilizing team-working skills. Olenick and Allen (2013) had previously failed to show any correlation in gender on attitudes to IPE, IPP, or intent to engage in IPE. However, Olenick and Allen's rather extensive sampling was primarily female. Olenick and Allen did find a positive statistical correlation to administration and intent to engage in IPE. The present literature leans towards alterations in

perceptions based on experience and further studies considering the correlation between time in IPE and attitudes to IPE can further be explored.

Summary

Utilizing David Kolb's experiential learning theory, health profession faculty can begin the process of designing effective Sim-IPE as defined by the INACSL Standards Committee (2016). Grounding simulation in experiential learning gives the groundwork for creating a realistic, content driven experience and preparatory work. Then designing appropriate reflective exercises and evaluation. Finally providing feedback for further development of skills and objectives in future experiences. Providing opportunity through simulation to enhance core competencies in interprofessional practice is made more permanent through increased experiences (Poore, Cullen, & Schaar, 2014). Sim-IPE provides students with all levels of experiential learning by beginning with concrete realization of skills through coursework, experimentation through simulation, reflective observation and abstract conceptualization with guided debriefing, and then further experimentation when information is later utilized in clinicals and/or classes.

The extent of simulation-based experience development involves time, resources, and schedule coordination when looking at IPE (Failla & Macauley, 2014). Faculty are responsible with the allocation of resources and collaboration across disciplines to enable experiences to be authentic for students. Though early research in Sim-IPE and other IPE programs questioned applicability of information into student learning and patient outcomes, newer research has reinforced these values (Khan, Shahnaz, & Gomathi, 2016; Risling-de Jong et al., 2016). The concern remains that faculty and administration still find barriers to IPE that prevent implementation into curriculum (Failla & Macauley, 2014; Palaganas et al., 2014). Faculty in

varying departments must overcome scheduling barriers and interprofessional differences in objectives and values to create a meaningful educational experience for all students involved.

Current research in faculty attitudes towards Sim-IPE include cross sectional surveys and qualitative interviews of faculty (Al-Qahtani & Guraya, 2016; Casa-Levine, 2017; Olenick & Allen, 2013). No current, published research surrounds faculty attitudes with reference to designed Sim-IPE experiences. Research abounds in changes in students' attitudes to interprofessional education and practice as well as IPEC standards following involvement in IPE and Sim-IPE. Studies with students have shown positive improvements in attitudes and perceptions following involvement in Sim-IPE (Iverson et al., 2018; Paige et al., 2015; Wharton & Burg, 2017). Studies considering large-scale, multidiscipline Sim-IPE is available to a lesser basis, but what exists shows increased respect of students to other disciplines in pre/post survey responses (Miller et al., 2014; West et al., 2015). Again, faculty considerations of multiple disciplines involved in a Sim-IPE are not currently available.

Studies examining faculty attitude change following involvement in Sim-IPE could potentially reveal information for simulation center faculty and administration to provide guidance and improvements to faculty development for Sim-IPE implementation. Current research in faculty development for IPE reveals improvements in attitudes and desire to implement interprofessional educational events, courses, and curricula (Grymonpre, 2016; Poirier & Wilhelm, 2014; Steinert, 2005). Lack of faculty and/or administrative support can provide a barrier to interprofessional education in general and specifically Sim-IPE (INACSL Standards Committee, 2016). Understanding of faculty attitudes and perceptions to Sim-IPE could provide a means to overcoming these barriers to student learning. Previous IPE experience of students has corresponded to improved perceptions of readiness for IPC (Sevin et al., 2015).

Limited research in faculty previous IPE experience and attitudes towards IPE exists (Casa-Levine, 2017). Consideration of previous levels of experience must first be explored to examine both intervention of involvement and attitudes of faculty.

CHAPTER THREE: METHODS

Overview

In order to examine faculty attitudes of interprofessional education (IPE) in simulation, this researcher explored attitudes relative to previous experience. The purpose of this quantitative study was to explore the effects of a Sim-IPE experience on the attitudes of faculty toward teamwork and IPE. Utilizing both correlational and repeated measures methodologies, a single-case, repeated measure was used to explore the effects of a Sim-IPE experience on the attitudes of faculty toward teamwork and IPE. The researcher considered the previous experience in simulation on faculty attitudes after involvement in a large-scale simulation-based interprofessional education (Sim-IPE) event. The researcher further utilized the literature to identify potential differences and changes in attitudes towards interprofessional education and health care teams of health profession faculty prior to and following involvement in a simulation-based interprofessional education experience. Accomplishing this goal required the researcher to develop and implement a process of data collection that attended to the research questions and hypotheses mentioned in this section. Further in this section, the researcher will describe the methodology including research design, participants, setting, instruments, procedures, and data analysis.

Design

The researcher followed both a correlational observation of faculty attitudes in reference to previous experience as well as a repeated measures design to address collected survey data from the faculty before and after a Sim-IPE. These types of quantitative measurement of survey data are useful when results are numerical and can be categorized to better understand relationships between variables in order to generalize findings to the population in question

(Gall, Gall, & Borg, 2007). Correlational research can help define the relationship between two variables (Gall et al., 2007). In this study, the predictor variable of years of previous IPE experience was studied for effect on the criterion variables of faculty attitudes to IPE and health care teams. This initial exploration helped to lend understanding to changes in attitudes when confronted with faculty across disciplines.

Repeated measures design allows a researcher to explore potential relationships between variables surrounding an event. For a single case design, when measurements are taken over time, the measurements can be considered for changes in effects due to the event (Gall et al., 2007). Utilizing a single-case, repeated measure method, the researcher sought to investigate the impact of participation in an event, to identify cause and effect relationships within variables (Frey, 2018). The independent variables of pre- and post-experience were studied for the dependent variables of scale scores for faculty attitudes towards IPE and healthcare teams. The sample was not randomized nor was there a control group that is not subject to the treatment, or event. As there was no control group, the pre-event survey provided a baseline to attitudes.

Research Questions

Utilizing a criterion variable of prior involvement in interprofessional education for the first two questions, the predictor variables of attitude toward IPE scores and attitude toward health care team scores was used to guide the research. In questions three and four, faculty as a whole were studied for the independent variables of pre and post event, with dependent variables of attitude toward IPE scores and attitude toward health care team scores. The research questions studied are as follows:

RQ1: Is there a relationship between previous years of experience in IPE and faculty attitudes towards interprofessional education following a Sim-IPE?

RQ2: Is there a relationship between previous years of experience in IPE and faculty attitudes towards health care teams following a Sim-IPE?

RQ3: Is there a difference in faculty attitudes towards interprofessional education before and after involvement in Sim-IPE?

RQ4: Is there a difference in faculty attitudes towards health care teams before and after involvement in Sim-IPE?

Hypotheses

The null hypotheses for this study are:

$H_0$1: There is no significant correlation between level of previous experience with IPE and attitude towards IPE scores for faculty after a simulated acute care IPE experience.

$H_0$2: There is no significant correlation between level of previous experience with IPE and attitude towards health care team scores for faculty after a simulated acute care IPE experience.

$H_0$3: There is no significant difference in pre-experience and post-experience attitude towards IPE scores in faculty involved in a simulation-based interprofessional education experience.

$H_0$4: There is no significant difference in pre-experience and post-experience attitude towards health care teams scores in faculty involved in a simulation-based interprofessional education experience.

Participants and Setting

Data were collected at a private southeastern university with a college of health sciences without a medical school. The archival data were surveys that were collected before and after a scheduled event at the university as part of annual evaluations for the Experiential Learning and

Simulation Center. Following IRB approval, the data were retrieved from the digital commons it is held in as part of the evaluations for the center. Faculty within the college are licensed health professionals serving within their discipline in schools and departments that educate students to become certified and licensed health professionals. Programs using the center include, but are not limited to, bachelor's of nursing science, doctorate of nursing practice, doctorate of nurse practice in nurse anesthesia, doctorate of pharmacy, doctorate of physical therapy, master's of science in social work, master's of healthcare administration, bachelor's of science in food and nutrition, certified dietetic internship, master's of science in cardiopulmonary sciences, and master's of speech language pathology. Faculty within the university are approximately 67% female. Faculty have a range of experience within their professions from 1–25+ years.

Faculty from all supporting programs were surveyed, including full time, part time, and adjuncts who were involved in the simulation-based IPE experience. The event required faculty involvement in the design, planning, and implementation. The simulation-based event involved programs of undergraduate nursing, graduate nursing, physical therapy, social work, nutrition, pharmacy, respiratory therapy, speech pathology, and health care administration. A convenience sample of all faculty involved in the simulation event created all responses. In an event of this magnitude, the ratio of faculty to students is skewed to the students. Controlling the intervention details provided a greater emphasis on the significance of the results and allowed for a larger effect size to be considered. For a large effect size, the sample size desired for initial correlational tests at .7 power level and $\propto = .05$ is N = 23 (Gall et al., 2007). For the same parameters for the paired *t*-test N = 22 (Gall et al, 2007), so the proposed sample size was greater than 23. The available archival data set has 24 matched pairs and would have been sufficient for this analysis. However, in further consideration of complete data in each pair, only 22 pairs were

available for data analysis. Though this is less than the target sample size for the correlational tests, the analysis was run with N = 22. For a large effect size at a .5 power and $\propto = .05$, the sample size desired is N=15 (Gall et al., 2007).

Instrumentation

Two instruments were utilized to assess attitudes of faculty members in a college of health sciences towards simulation-based interprofessional education. Both scales had been adapted in their wording from previously validated scales utilized to assess attitudes of students towards simulation-based IPE. The adaption of the scales to appropriate wording for faculty was designed and studied by Curran, Sharpe, and Forristall in 2007. The two scales were the Attitudes towards Interprofessional Education (AIPE) and the Attitudes Towards Health Care Teams (ATHCT). See Appendix A for the AIPE and Appendix B for the ATHCT.

Both surveys collected were from Curran et al. (2007), the AIPE and the ATHCT. Curran granted approval for use in this study (see email in Appendix C). Negatively worded questions have been previously identified and were reverse coded for analysis (Gary, Gosselin, & Bentley, 2018). The scales were selected to determine faculty attitudes towards IPE and interprofessional teams as Sim-IPE is a team-based activity. Pre-event surveys were administered via email and were opened a month prior to the event, closing on the day of the event. Post-event surveys were opened on the evening of the last day of the event and remained open for one month prior to the completion of the event. Reminder emails were sent for follow up to faculty and students one-week post event. Pre-event surveys took around 5 minutes to complete while post-event surveys, due to the additional open-ended responses that were included for Center purposes, took around 8 minutes to complete.

Attitudes Towards Interprofessional Education

The AIPE scale was adapted from the Readiness for Interprofessional Learning Scale (RIPLS) developed by Parsell and Bligh (1999) for students. The purpose of the RIPLS was to determine if students in health profession programs are aware of the various dynamics in interprofessional care, including collaboration and teamwork, roles and responsibilities, and benefits to patient care (Parsell & Bligh, 1999). The adaptions of Curran et al. (2007) in the formation of the AIPE allow clinicians, faculty, preceptors, and peers to evaluate student readiness.

The AIPE has been used through various cross-sectional and experimental studies to discover students' attitudes in health profession education as well as changes before and after IPE events (Keshtkaran, Sharif, & Rambod, 2014; Thompson, Bratzler, Fisher, Torres, & Sparks, 2016). RIPLS has been studied by various authors for validity. While the original authors (Parsell & Bligh, 1999) identified a three-factor scale for the overall test, a four-factor scale has been revealed in the studies utilizing the original RIPLS (Cant, Leech, & Hood, 2015; McFayden et al., 2005; Williams, Brown, & Boyle, 2012). These factors include shared learning, professional identity, teamwork and collaboration, and roles and responsibilities. Williams et al. (2012) further identified the strength of the four factors for unidimentionality and construct validity within the four-scale model. Williams et al. did question the invariance of item 18 which is omitted in the adaption by Curran et al. (2007). High content validity was initially established by the original authors in 1998 (Parsell & Bligh, 1999). In 2006 Reid, Bruce, Allstaff, and McLernon further identified content validity with reference to post-graduate professionals. Initial face and content validity were established through a group of health care experts. Further, using principle component analysis, Reid et al. (2006) demonstrated construct

validity through factor analysis.

The AIPE includes 15 of the original 19 items, omitting what was originally deemed "roles and responsibilities" as well as item 10 "I don't want to waste time learning with other healthcare students" (Parsell & Bligh, 1999, p. 98). In development, the AIPE received a Cronbach's alpha of .92 (Curran et al., 2007). AIPE has been furthered studied cross-sectionally among health profession faculty by Al-Qahtani and Guraya (2016), Casa-Levine (2017), Gary et al. (2018), and Olenick and Allen (2013). Studies have included faculty involved in education of dentistry, dental hygiene, nursing, pharmacy, medicine, physical therapy, occupational therapy, physician assistant, and social work. The AIPE is a 15-item scale using a 5-point Likert-scale ranging from 1 = strongly disagree to 5 = strongly agree. Combined available points for the AIPE are 15 to 75 when negatively worded questions (of which there are two) are reverse coded. Reverse coding is necessary on: "Clinical problem solving can only be learned effectively when students are taught within their individual department/school," and "It is not necessary for undergraduate health care students to learn together" (Curran, Sharpe, & Forristall, 2007, p. 894). A score of 15 would indicate very low readiness of students for interprofessional learning and a high score of 75 would indicate ample readiness to engage in interprofessional learning (Parsell & Bligh, 1999). Using reverse coding on negatively worded items and the scale provided by the original researchers, the researcher scored the surveys for analysis using an excel spreadsheet with data exported from Qualtrics. Data were further exported into SPSS for analysis.

Attitudes Towards Health Care Teams

The ATHCT scale was developed in 2002 by Heinemann, Schmitt, and Farrell for health professionals through a joint commission with the Department of Veterans Affairs. The purpose

of the ATHCT scale was to determine the perception, behavior, and attitudes of individuals towards working in a health care team (Heinemann, Schmitt, Farrell, & Brallier, 1999). Adaptions by Curran et al. (2007) were intended to tailor the original scale for use in determining student and faculty attitudes towards collaborative and team-based interprofessional education.

When considering the quality of care factor, the 14 questions returned a Cronbach's alpha of .83. Initial pilot studies of the scale developed by Heinemann et al. (1999) involved content validity by experts within healthcare education and practice. Further phases of studies by the original authors addressed construct validity identifying three factors for the scale (Heinemann et al., 1999). Construct validity was significantly positively correlated for the quality of care and cost of team care, while not supported for physician centrality. Four experts were called upon for content validity and found 95% agreement within the scale (Heinemann et al., 1999). Hyer, Fairchild, Abraham, Mezey, and Fulmer (2000) revisited the construct validity of the scale and again positively identified the three factors of team value (quality of care), team efficiency (costs of team care), and shared leadership (physician centrality).

The adaption by Curran et al. (2007) included 14 of the original 21 items, eliminating the third factor of physician centrality. Curran et al. presented this section to health profession faculty resulting in a Cronbach's alpha of .88. This amended scale was further tested by Gary et al. (2018) with faculty in dentistry, nursing, medicine, pharmacy and physical therapy. Cross sectional analysis showed mostly positive attitudes by the faculty, with slightly greater results in nursing faculty. The ATHCT is a 14-item scale, both using a 5-point Likert-scale ranging from 1 = strongly disagree to 5 = strongly agree. Combined available points for the ATHCT are 14 to 70 when negatively worded questions (of which there are two) are reverse coded. Reverse coding is necessary on: "Developing an interprofessional patient/client care plan is excessively

time-consuming," "Working in an interprofessional manner unnecessarily complicates things most of the time," and "In most instances, the time required for interprofessional consultations could be better spent in other ways" (Curran et al., 2007, p. 894). A low score of 14 would indicate those taking the survey have a low perceived value of working in a health care team and a high score of 70 would indicate those taking the survey have a high perceived value of working in a health care team. Using reverse coding on negatively worded items and the scale provided by the original researchers, the researcher scored the surveys for analysis using an Excel spreadsheet with data exported from Qualtrics. Data were further exported into SPSS for analysis.

Procedures

Following IRB approval at both the institution of study and at Liberty University, the researcher retrieved archival data from the surveys and demographics. See Appendix D for IRB approval from Liberty University and Appendix E for IRB approval from Samford University. Surveys were administered before and after a large-scale simulation-based IPE event that ran for two days. The pre-event surveys required demographic information regarding previous involvement in IPE (measured in years), department, and program. The post-event surveys required the same demographics as well as number of students involved in the simulation. The surveys were loaded through Qualtrics software systems. The researcher sent the link for the surveys via email to all faculty involved in the simulation, first the pre-event link one month prior to simulation. The researcher sent the post-event link with the email containing other pertinent information for the day of simulation and was followed up one week later in a separate email. As exempt status was granted by both IRBs, no informed consent was required to be sent to survey participants.

Surveys were collected within the Experiential Learning and Simulation Center to assist with understanding of faculty use of the Center. Yearly data collection is available to center faculty to utilize and does not include identifying information past department, program, and extent of IPE use. All students and faculty are regularly expected to complete surveys and evaluations of experiences for simulation within the center. The center is currently under provisional accreditation and is actively seeking full accreditation, which further requires evaluations.

The simulation event was a yearly large-scale event wherein the Center is transformed into a working hospital with emergency department, medical-surgical units, intensive care unit (ICU), labor and delivery, and pediatric ICU. Students from nursing, pharmacy, physical therapy, social work, nutrition, respiratory care, speech pathology, and health care administration were divided into unit teams to care for patients over a three-hour shift. Faculty and preceptors from graduate nursing and physician's assistant studies portrayed providers in the simulation. Four 3-hour shifts were completed in 2 days, each day's 6-hour simulation is a continuous unfolding event. Faculty provided briefing and orientation, facilitation during simulation, and debriefing. Simulated persons were used as patients in all but the ICU, labor and delivery, and pediatric unit. In these areas they were family members while simulators were patients.

Data Analysis

Following archival data retrieval, the researcher evaluated data from pretests and posttests, as well as demographics, for descriptive statistics. Values were identified for all faculty pretest and posttest for each scale independently. Data were screened for incomplete surveys and missing years of experience; any incomplete data sets were eliminated. Measures of central tendency for each scale pretest and posttest were identified with the criterion variables of

faculty length of experience in IPE (which were previously divided into 2-year increments, per demographics collected by the Center). Measures of variability, the mean, median, and standard deviations, were determined. Box and whisker plots were used to screen for extreme outliers for each variable. Analysis was run on an available sample of 22 matched pairs. For a large effect size, population desired for initial correlational tests at .5 power level and $\alpha = .05$ with N = 15 (Gall et al., 2007). For a large effect size, population desired for initial repeated measured tests at .7 power level and $\alpha = .05$ for the paired *t*-test N = 22 (Gall et al., 2007).

Analysis of Null Hypotheses 1 and 2, Correlation

Spearman rank correlation is a nonparametric measure of the strength and direction of association that exists between two variables measured on at least an ordinal scale (Gall et al., 2007). In this study, the variable years of experience was measured on an ordinal scale with the AIPE and ATHCT scores were interval scores. Correlational assessment of the predictor variables of previous IPE experience upon criterion variable of scale answers after simulation was determined. Level of measurement was ordinal for the criterion variable of years of experience and interval for scale values. Each scale was considered independently and scores were totaled and considered for first the AIPE and then for ATHCT. Scores were then converted to rank sums for each scale. Null hypotheses 1 and 2 were analyzed with Spearman rank order test analysis. Spearman rank orders test has three assumptions: a) that the data consists of two continuous or ordinal variables; b) the variables represent paired observations; and c) that there exists a monotonic relationship between the two variables (Warner, 2013). As the variables were ordinal and rank, the initial assumption is met. The data were also paired, meeting the second assumption. The data were next reviewed through scatter plots for outliers. The scatter plot was further assessed for monotonic distribution. Limiting Type I error, a Bonferroni correction was

utilized as two analyses are run on the same set of data. The alpha level was then calculated to be: 0.05/2 = .025 (Warner, 2013). Therefore, the alpha level was set at $p < .025$.

Analysis for Null Hypotheses 3 and 4, Paired Sample *t*-Tests

For assessment of the final two research questions, a paired *t* test for pretest and posttest information for all faculty involved in a simulation-based IPE event was performed. The paired-samples *t test* is used to determine if the means are significantly different between paired observations (Gall et al., 2007). The participants are either the same individuals tested at two time points or under two different conditions on the same dependent variable. In this study, the participants are the same individuals tested before and after the event. The paired-sample *t* test assumes one dependent variable is measured on a ratio or interval scale, as in this study, and one independent variable is categorical, which in this study was matched pairs. The paired *t* test examined whether significant changes existed in either faculty attitudes towards interprofessional education or faculty attitudes towards healthcare teams. The dependent variable was considered as interval for each scale measured. Observations within each variable were independent. The data were archival, so a convenience sample of participating faculty was utilized.

When considering utilizing a *t* test, the following assumptions must be verified: box and whisker plots for outliers, assumption of normality, and assumption of equal variance (Warner, 2013). While the *t* test is fairly robust to the assumptions, it is still important to consider the results in understanding of validity of overall statistical analysis. Following a box and whisker plot for extreme outliers, the Shapiro-Wilks test was run to assess for normality since the sample size is less than 50. The Levene's test for homogeneity was determined for each scale's pretest and posttest scores for all faculty. After considering results of assumptions, a paired *t* test was performed for each scale considering the variation between pretest and posttest scores for all

faculty involved. Limiting Type I error, a Bonferroni correction was utilized as two analyses are run on the same set of data. The alpha level was then calculated to be: 0.05/2 = .025 (Warner, 2013). Therefore, the alpha level was set at $p < .025$.

Due to violations of the assumptions of normality for both *t* tests, additional non-parametric tests were run on the data. A Wilcoxon Sign Rank test was performed for pre and post data for each scale. The Wilcoxon Sign Rank test is a nonparametric test used to consider the difference in the distribution of scores when the scores are taken from two samples or from one sample surrounding repeated measures (Gall et al., 2007). The Wilcoxon Sign Rank test does not require the assumptions of shape of score distribution or homogeneity of variance. The only assumption is that only two samples can be compared (Gall et al., 2007).

CHAPTER FOUR: FINDINGS

Overview

Following Institutional Review Board (IRB) approval at both the evaluating institution and at the host institution, data were deidentified and awarded to the researcher by one of the Center faculty who had access to the raw data. Data were paired for comparison and given case identifiers. Post scale data were further delineated into rank sums for analysis in correlation. Spearman's rho was utilized for correlational analysis. Repeated measures testing was analyzed with a paired *t* test and then Wilcoxon Signed Rank test for pre- and post-experience scale scores. The following chapter will review the existing research questions and null hypotheses. Further, in this section the data were considered with quantitative statistical testing to find answers to the null hypotheses originally identified by the researcher.

Research Questions

The research questions being studied are as follows:

RQ1: Is there a relationship between previous years of experience in interprofessional education (IPE) and faculty attitudes towards interprofessional education following a simulation-based interprofessional education (Sim-IPE)?

RQ2: Is there a relationship between previous years of experience in IPE and faculty attitudes towards health care teams following a Sim-IPE?

RQ3: Is there a difference in faculty attitudes towards interprofessional education before and after involvement in Sim-IPE?

RQ4: Is there a difference in faculty attitudes towards health care teams before and after involvement in Sim-IPE?

Null Hypotheses

The null hypotheses for this study are:

$H_0$1: There is no significant correlation between level of previous experience with IPE and attitude towards IPE scores for faculty after a simulated acute care IPE experience.

$H_0$2: There is no significant correlation between level of previous experience with IPE and attitude towards health care team scores for faculty after a simulated acute care IPE experience.

$H_0$3: There is no significant difference in pre-experience and post-experience attitude towards IPE scores in faculty involved in a simulation-based interprofessional education experience.

$H_0$4: There is no significant difference in pre-experience and post-experience attitude towards health care teams scores in faculty involved in a simulation-based interprofessional education experience.

Descriptive Statistics

Data obtained for the dependent variable of scores on the Attitudes Towards Health Care Teams (ATHCT) scale with independent variable of pre- and post-experience can be found in Table 1. The mean and standard deviation for pre- and post-event ATHCT scale scores is 61.09 (5.681) and 63.59 (5.324) respectively.

Table 1

Descriptive Statistics: Dependent Variable Scores on ATHCT

	N	Min	Max	Mean	Median	Std. Dev.	Skewness		Kurtosis
								Std. Error	
Pre-ATHCT	22	50	70	61.09	61	5.681	-.470	.491	-.553
Post-ATHCT	22	54	70	63.59	65.5	5.324	-.757	.491	-.502
Valid N (listwise)	22								

Data obtained for the dependent variable of scores on the Attitudes towards Interprofessional Education (AIPE) with independent variable of pre- and post-experience can be found in Table 2. The mean and standard deviation for pre and post experience AIPE scale scores are 69.68 (4.932) and 70.50 (5.646) respectively.

Table 2

Descriptive Statistics: Dependent Variable Scores on AIPE

	N	Min	Max	Mean	Std. Dev.	Median	Skewness		Kurtosis
								SE	
Pre-AIPE	22	55	75	69.68	4.932	72	-1.587	.491	2.540
Post-AIPE	22	52	75	70.50	5.646	72	-2.614	.491	6.684
Valid N (listwise)	22								

Data utilized for correlational analysis of rank post event scores on AIPE scale and years

of previous experience can be found in Table 3. The mean and standard deviation for post-ATHCT and post-AIPE when converted to rank are 11.500 (6.4568) and 11.500 (6.4031) respectively.

Table 3

Descriptive Statistics for Post Tests Converted to Ranks

	N	Min	Max	Mean	Std. Dev.	Median	Skewness		Kurtosis
								SE	
Post-ATHCT	22	2.0	21.0	11.500	6.4568	61	-.006	.491	-1.236
Post-AIPE	22	1.0	21.0	11.500	6.4031	65	-.016	.491	-1.193
Valid N (listwise)	22								

Results

Hypotheses

Correlational analysis RQ1. The first null hypothesis states there is no significant correlation between level of previous experience with IPE and attitude towards IPE scores for faculty after a simulated acute care IPE experience. In order to test this, a Spearman Rank Order correlation was considered for the predictor variable to years of experience and the criterion variable as score on the AIPE.

Data screening was conducted on values of scores on the AIPE converted to rank compared to years of experience to assess data inconsistencies, outliers, and normality. The researcher reviewed the scatter plot for inconsistencies and outliers (see Figure 1). No outliers were found. Considering the plot, the assumption of linearity for Spearman correlation is not met. A Spearman Rank Order was then run, though this lack of fit must be considered.

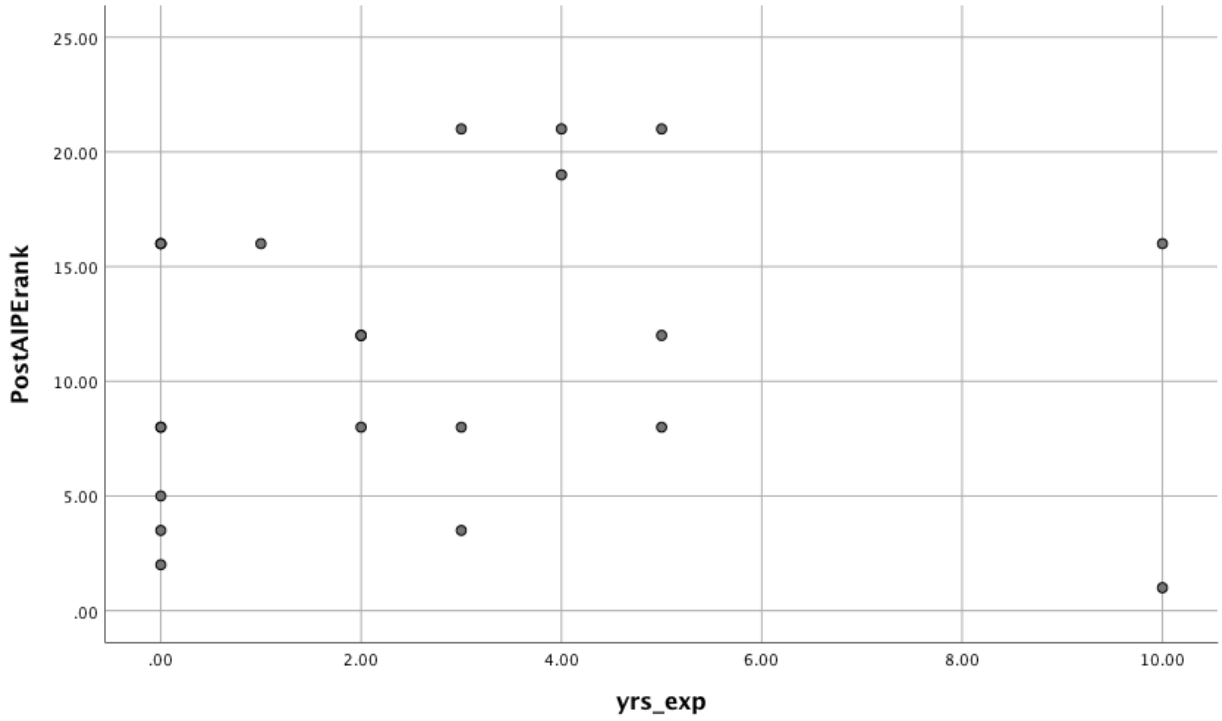

Figure 1. Scatter plot for years of experience and rank scores on AIPE.

A Spearman Rank Order was used to test the null hypothesis: there is no significant correlation between level of previous experience with IPE and attitude towards IPE scores for faculty after a simulated acute care IPE experience. There was not a statistically significant correlation between years of experience and rank scores on the AIPE post-experience, $r_s(21) = .214$, $p = .34$. Therefore, the researcher failed to reject the null hypothesis that there is no significant correlation between level of previous experience with IPE and attitude towards IPE scores for faculty after a simulated acute care IPE experience. See Table 4 for correlations between years of experience and rank scores on the AIPE post-experience.

Table 4

Correlation Between Years of Experience and Rank Scores on AIPE Post-Experience

			Yrs_Yxp	Post AIPE
Spearman's rho	Yrs_Exp	Correlation Coefficient	1.000	.214
		Sig. (2-tailed)		.340
		N	22	22
	Post-AIPE	Correlation Coefficient	.214	1.000
		Sig. (2-tailed)	.340	
		N	22	22

Correlational analysis RQ 2. The second null hypotheses states there is no significant correlation between level of previous experience with IPE and ATHCT scores for faculty after a simulated acute care IPE experience. In order to test this, a Spearman Rank Order correlation was considered for the predictor variable to years of experience and the criterion variable as score on the ATHCT.

Data screening was conducted on values of scores on the ATHCT converted to rank compared to years of experience to assess data inconsistencies, outliers, and normality. The researcher reviewed the scatter plot for inconsistencies and outliers (see Figure 2). No outliers were found. Considering the plot, the assumption of linearity for Spearman correlation is not met. A Spearman Rank Order was run, though this lack of fit must be considered.

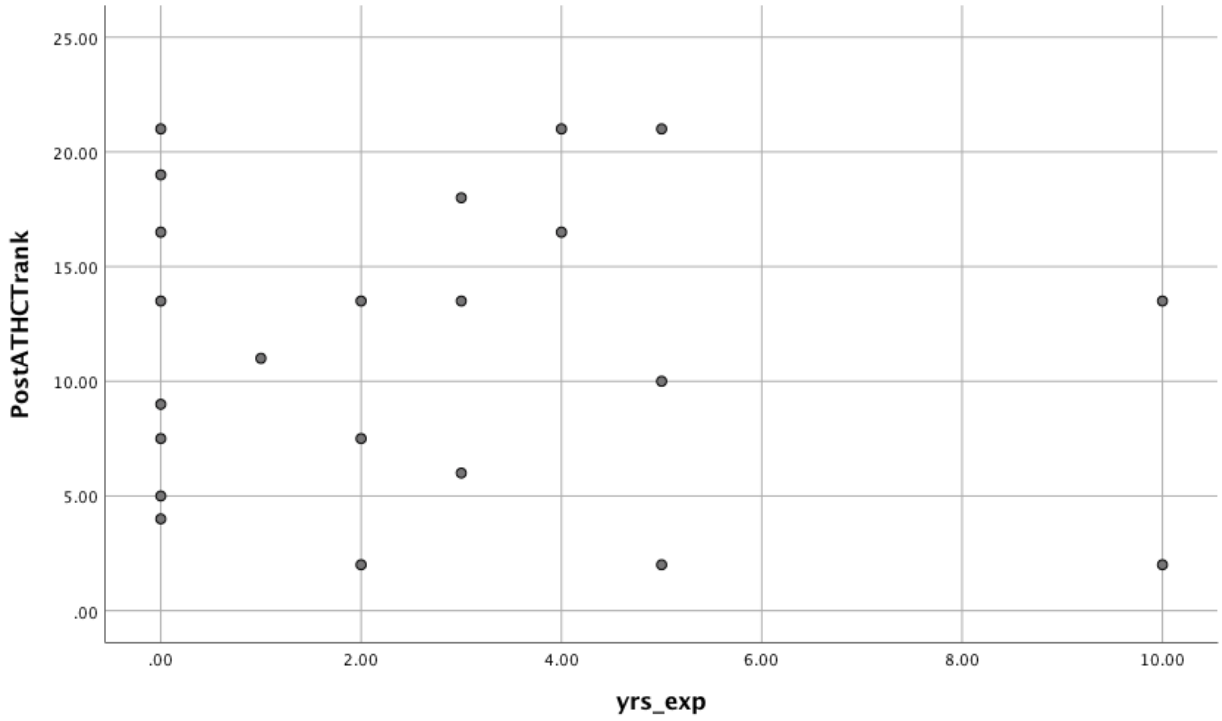

Figure 2. Scatter plot for years of experience and rank scores on ATHCT.

A Spearman Rank Order was used to test the null hypothesis: There is no significant correlation between level of previous experience with IPE and attitude towards health care team scores for faculty after a simulated acute care IPE experience. There was not a statistically significant correlation between years of experience and rank scores on the ATHCT post-experience, $r_s(21) = -.028$, $p = .902$. Therefore, the researcher failed to reject the null hypothesis that there is no significant correlation between level of previous experience with IPE and attitude towards healthcare team scale scores for faculty after a simulated acute care IPE experience. See Table 5 for correlations between years of experience and rank scores on the ATHCT post-experience.

Table 5

Correlation Between Years of Experience and Rank Scores on ATHCT Post-Experience

			Yrs_Exp	PostATHCT
Spearman's rho	Yrs_Exp	Correlation Coefficient	1.000	-.028
		Sig. (2-tailed)		.902
		N	22	22
	Post-ATHCT	Correlation Coefficient	-.028	1.000
		Sig. (2-tailed)	.902	
		N	22	22

Repetitive measures analysis RQ 3. The third null hypotheses states there is no significant difference in pre-experience and post-experience attitude towards IPE scores in faculty involved in a simulation-based interprofessional education experience. In order to test this, a paired *t* test was considered for the independent variable of before or after a simulation and the dependent variable of score on the AIPE scale.

Data screening was conducted on the dependent variable of scores on the AIPE scale regarding data inconsistencies, outliers, and normality. The researcher sorted the data on each variable and scanned for inconsistencies, see Figure 3. In review of normality, for pre-event AIPE scores the Shapiro-Wilks test (SW = .832, $df = 22$, $p = .002$) indicated a variation from normal distribution, as did the statistics for skewness (-1.587) and kurtosis (2.540), violating the assumption. For post-event AIPE scores, the Shapiro-Wilks test (SW = .632, $df = 22$, $p = .000$) indicated a variation from normal distribution, as did the statistics for skewness (-2.614) and kurtosis (6.684), violating the assumption. See Table 6 for Shapiro-Wilk test results.

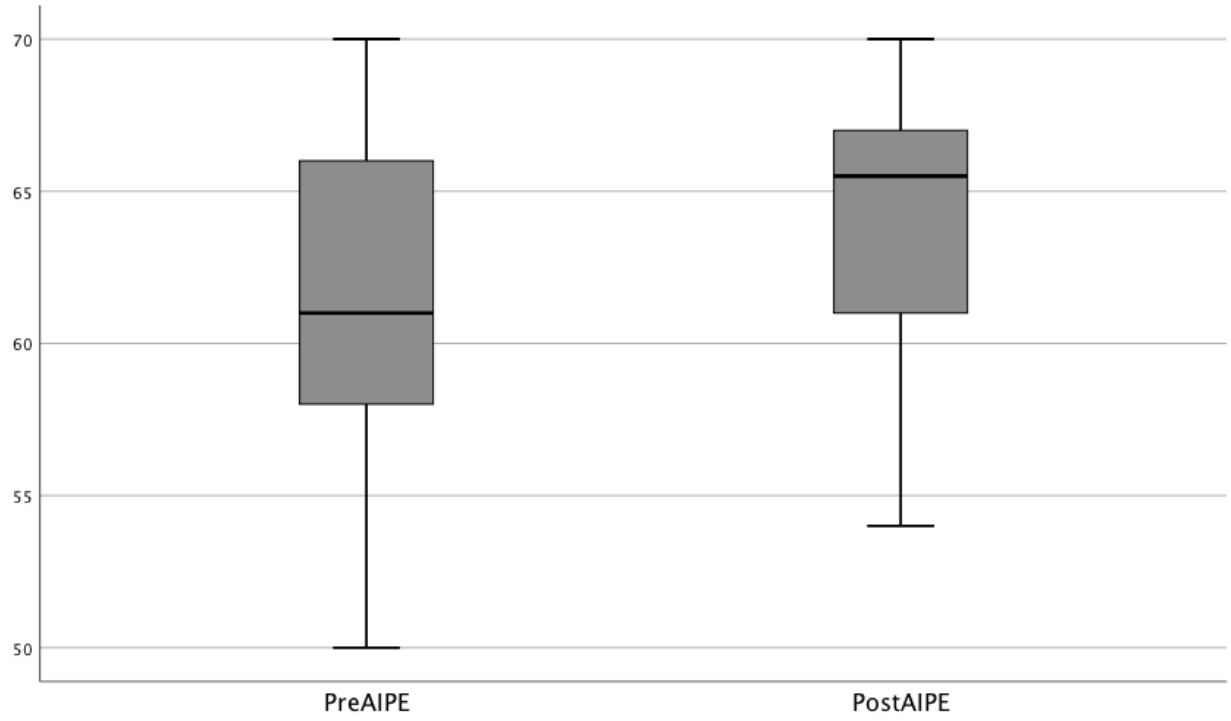

Figure 3. Boxplot for AIPE scale scores.

Table 6

Tests of Normality AIPE

	Shapiro-Wilk		
	Statistic	df	Sig.
Pre-AIPE	.832	22	.002
Post-AIPE	.632	22	.000

Despite the violations, a paired *t* test was run for pre- and post-event scores on the AIPE scale. A paired samples *t* test was conducted to compare pre-experience and post-experience attitude towards IPE scores in faculty involved in a simulation-based interprofessional education experience. There was not a statistically significant difference in the scores for pre-experience

scores (M = 69.68, SD = 4.932) and post-experience scores (M = 70.50, SD = 5.646); $t(21)$ = .654, p = .520. Therefore, the third null hypothesis that there is no significant difference in pre-experience and post-experience attitude towards IPE scores in faculty involved in a simulation-based interprofessional education experience was not rejected. See Table 7 for tests of between time effects.

Table 7

Tests of Between Time Effects AIPE

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig (2 tail)
Pair 1	Post-AIPE – Pre-AIPE	0.818	5.869	1.251	-1.784	3.42	0.654	21	0.52

Table 8

Tests of Between Time Effects Wilcoxon Ranks AIPE

		N	Mean Rank	Sum of Ranks
Post-AIPE – Pre-AIPE	Negative Ranks	7[a]	11.71	82
	Positive Ranks	14[b]	10.64	149
	Ties	1[c]		
	Total	22		

a. Post-AIPE < Pre-AIPE, b. Pos-tAIPE > Pre-AIPE, c. Post-AIPE = Pre-AIPE

Test Statistics[a]	Post-AIPE – Pre-AIPE
Z	-1.171[b]
Asymp. Sig. (2-tailed)	0.242

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Due to the violations of assumptions for the paired *t* test, a Wilcoxon Rank Sum test was also performed with the data. The non-parametric Wilcoxon test allows greater confidence that does not have the requirement of normal distribution. A Wilcoxon Signed-Ranks test indicated that the post-experience attitude towards IPE scores in faculty ranks, *Mdn* = 72 was not statistically significantly higher than pre-experience attitudes towards IPE scores in faculty, *Mdn* = 72, Z = -1.171, $p < .242$. Again, the null hypothesis was not rejected for the critical value of *z* as the *p* value was not within optimal range (less than .025) ($p = .242$). See Table 8 for test of

between time effects with the Wilcoxon Rank Sum.

Repeated measures analysis RQ 4. The fourth and final null hypotheses states there is no significant difference in pre-experience and post-experience attitude towards health care teams scores in faculty involved in a simulation-based interprofessional education experience. In order to test this, a paired *t* test was considered for the independent variable of before or after a simulation and the dependent variable of score on the ATHCT scale.

Data screening was conducted on the dependent variable of scores on the ATHCT scale regarding data inconsistencies, outliers, and normality, see Figure 4. No extreme outliers were present, so all data were retained. The researcher sorted the data on each variable and scanned for inconsistencies. In review of normality, for pre-event ATHCT scores the Shapiro-Wilks test (SW = .953, $df = 22$, $p = .357$) indicated no variation from normal distribution, as did the statistics for skewness (-.470) and kurtosis (-.553). For post-event ATHCT scores, the Shapiro-Wilks test (SW = .885, $df = 22$, p = .015) indicated a variation from normal distribution, though the statistics for skewness (-.757) and kurtosis (-.502) did not violate the assumption. See Table 9 for Shapiro-Wilk test results.

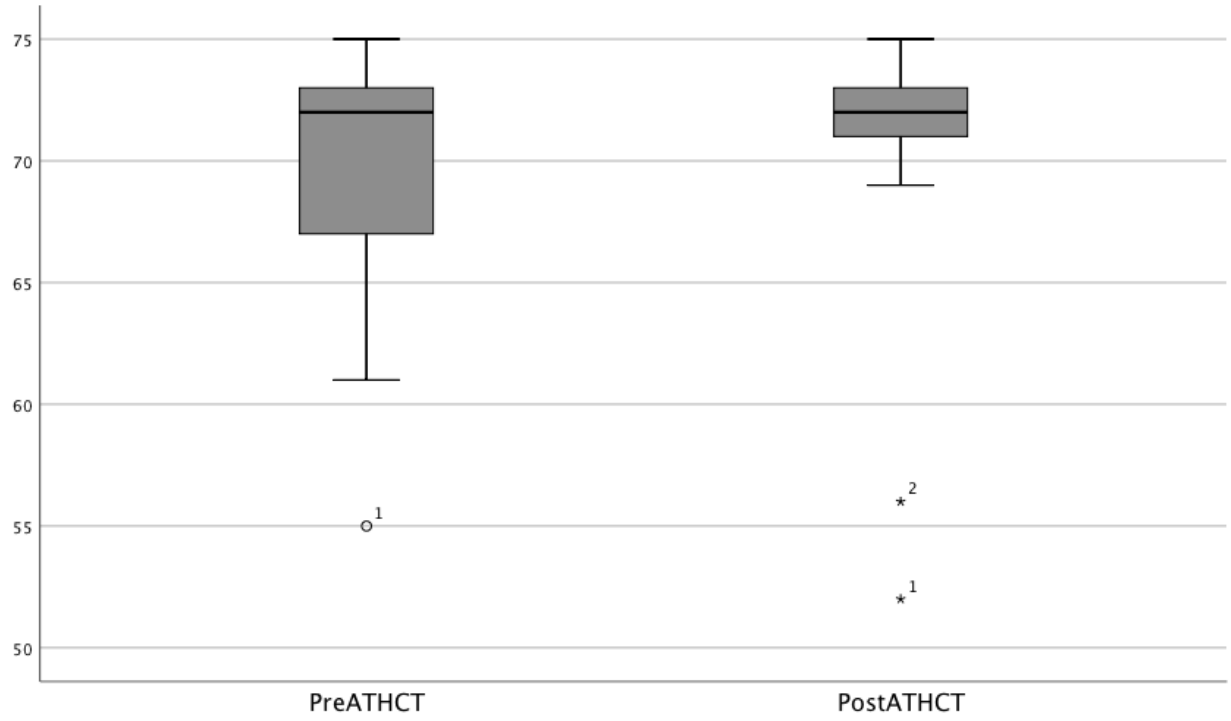

Figure 4. Box plot for ATHCT scale scores.

Table 9

Tests of Normality for ATHCT

	Shapiro-Wilk		
	Statistic	df	Sig.
Pre-ATHCT	.953	22	.357
Post-ATHCT	.885	22	.015

Despite the violations, a paired *t* test was run for pre- and post-event scores on the ATHCT scale. There was not a statistically significant difference in the scores for pre-experience scores ($M = 61.09$, $SD = 5.681$) and post-experience scores ($M = 63.59$, $SD = 5.324$); $t(21) = 1.618$, $p = .121$. Therefore, the third null hypothesis that there is no significant difference

in pre-experience and post-experience attitude towards health care team scale scores in faculty involved in a simulation-based interprofessional education experience was not rejected. See Table 10 for tests of between time effects.

Table 10

Tests of Between Time Effects ATHCT

				95% CI		*t*		
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper		df	sig
Pair 1 Post-ATHCT – Pre-ATHCT	2.500	7.249	1.545	-.714	5.714	1.618	21	.121

Due to the violations of assumptions for the paired *t* test, a Wilcoxon Rank Sum test was also performed with the data. The non-parametric Wilcoxon test allows greater confidence that does not have the requirement of normal distribution. A Wilcoxon Signed-Ranks test indicated that the post-experience attitude towards health care team scale scores in faculty ranks, *Mdn* = 65.5 was not statistically significantly higher than pre-experience attitudes towards health care team scale scores in faculty, *Mdn* = 61, Z = -1.675, $p < .094$. See Table 11 for test of between time effects with the Wilcoxon Rank Sum.

Table 11

Test of Between Time Effects Wilcoxon Ranks

		N	Mean Rank	Sum of Ranks
Post-ATHCT – Pre-ATHCT	Negative Ranks	7[a]	7.64	53.50
	Positive Ranks	12[b]	11.38	136.50
	Ties	3[c]		
	Total	22		

a. Post-ATH < Pre-ATH, b. Post-ATH > Pre-ATH, c. Post-ATH = Pre-ATH

Test Statistics[a]

	Post-ATHCT – Pre-ATHCT
Z	1.675[b]
Asymp. Sig. (2-tailed)	.094

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

CHAPTER FIVE: CONCLUSIONS

Overview

This study sought to explore faculty perceptions of interprofessional education (IPE) with consideration of involvement in a large-scale simulation-based interprofessional education experience (Sim-IPE). Following a summary of the data analysis, trends and findings will be discussed. As IPE is an increasingly important topic in the educational programs of health professions, implications of the research will be explored. Considerations regarding limitations of the current study will be outlined. Finally, potential directions for future research based off of faculty attitudes in interprofessional simulation education based on the results of the study will be presented.

Discussion

The purpose of this quantitative study was to explore the effects of a Sim-IPE experience on the attitudes of faculty toward teamwork and IPE. The findings of this study were not significant to reject the null hypotheses presented. The initial elevated values of the current study's findings may have presented a ceiling effect that was therefore not able to produce significant results. The available literature does discuss cross sectional comparisons of health profession faculty in various states and countries and their current attitudes towards interprofessional education and interprofessional health care teams.

In Curran, Sharpe, and Forristall (2007), the mean average for the Attitudes towards Interprofessional Education (AIPE) was 4.02. Considering the study's current means and dividing by the number of items per scale, mean average for the pretest AIPE was 4.65 and posttest 4.7. Additionally, in the Curran et al. study, the mean average for the ATHCT was 4.02. Considering the study's current means and dividing by the number of items per scale, mean

average for the pretest ATHCT was 4.36 and posttest was 4.54. In a similar study, Gary, Gosselin, and Bentley (2018) examined health care faculty in dentistry, nursing, medicine, pharmacy, and public health. Nursing provided the highest group mean score per item with AIPE at 4.44 and ATHCT at 3.99. Again, the mean averages for the faculty in the current study exhibit a higher pretest score on each scale than those found in the literature.

In a recent study by Olenick and Allen (2013), highest group means for AIPE was 63.19 (*SD* = 5.80) and for ATHCT was 57.29 (*SD* = 6.73). The overall means for the current study for the pretest AIPE were 69.68 (*SD* = 4.932), and for the pretest ATHCT were 61.09 (*SD* = 5.681). Olenick and Allen used a 14-item scale for both scales, unlike the 15-item AIPE used in this and Curran et al (2007). Taking into consideration the differences in number of items, the per item mean for the AIPE in Olenick and Allen's study was 4.51 while the current study per item mean was 4.65 for the pretest AIPE and 4.70 for the posttest. Olenick and Allen noted that faculty scored lower on the ATHCT than on the AIPE in their study, even falling below the midpoint. The faculty surveyed showed a greater aptitude for perceptions of IPE prior the event than those even originally found in the literature.

As IPE is a standard in many programs and interprofessional practice (IPP) has been exposed as a prime medium to generate positive patient outcomes, especially in increasing publication over the past 20 years, these high numbers are not surprising. Al-Qahtani and Guraya (2016) followed this study by surveying two universities faculty with the AIPE. They found largely positive attitudes among the 100 faculty with a mean of 4.17. Again, the current study's pretest mean for the AIPE was 4.65.

Research Questions 1 and 2

The first set of research questions considered the potential relationship between previous

years of experience in IPE and faculty attitudes. Research question 1 asked: Is there a relationship between previous years of experience in IPE and faculty attitudes towards interprofessional education following a simulation-based interprofessional education (Sim-IPE)? Research question 2 asked: Is there a relationship between previous years of experience in IPE and faculty attitudes towards health care teams following a Sim-IPE?

The researcher first considered years of experience on a scale of 0 to 10 or more years. No significant values were found. Giordano, Umland, and Lyons (2012) obtained demographics with faculty with no, some, or extensive experience, though did not compare means among these groupings. Levy and Mathieson (2017) considered faculty in groupings of 2 years of experience up to 5 years, however did not report findings on variations in AIPE nor ATHCT scores for these variables. Similarly, though this study reported the demographics of variation both individually by year and in groupings, no significant findings were seen due to the variation of years of experience.

Another breakdown in the research was current IPE engagement and previous IPE engagement (Olenick & Allen, 2013). Significant positive differences were seen in AIPE and ATHCT for faculty members who were currently involved in IPE as well as for faculty members who were previously involved in IPE. As initial AIPE scores were found to be high predictors of intent to engage in IPE, the correlation with faculty previous experience and current involvement in IPE also influences future practice. In the current study, the lack of variability found between levels of previous engagement in IPE could be due to the low number of participants, or could be due to the greater mean found in the present study. With the high expectations seen overall, variation may not be able to be statistically verified.

Kolb's experiential learning theory is formulated in a cyclical nature involving concrete

experimentation, reflective observation, abstract conceptualization, and active experimentation (Kolb, 2015). The well-designed nature of the simulation-based experience provided an opportunity for the faculty studied to engage in this cycle of learning. The act of planning and implementation provided faculty with an opportunity to explore concrete experimentation. The tools used to study faculty perceptions provides an opportunity for reflective observation. The potential for redesign of the simulation for future years and implementation of future interprofessional education experiences completes the cycle of conceptualization and further experimentation. Consideration of attitudes following Sim-IPE explores the faculty's reflection and their potential for future implementation. Other research has found a negative correlation between years of increasing IPE experience and attitudes towards IPE (Hinderer et al., 2016), whereas this study found similar attitudes regardless of previous experience. This finding could provide avenues for further conceptualization and experimentation due to the high attitudes of all faculty after Sim-IPE.

Research Questions 3 and 4

The second set of research questions considered the potential differences in faculty attitudes before and after involvement in Sim-IPE. Research question 3 asked: Is there a difference in faculty attitudes towards interprofessional education before and after involvement in Sim-IPE? Research question 4 asked: Is there a difference in faculty attitudes towards health care teams before and after involvement in Sim-IPE?

The researcher examined results of faculty attitudes according to the AIPE and ATHCT scales pre- and post-involvement in an acute care IPE experience. In the boxplots, a small positive shift is seen in both faculty perceptions of interprofessional education and interprofessional health care teams, viewed in the AIPE and ATHCT respectively. However,

neither the *t*-test analysis nor the Wilcoxon Rank Sum analysis produced significant results. No current research is available that illustrates faculty perceptions around an interprofessional student education event. When involved in interprofessional faculty development, faculty have shown gains in attitudes and perceptions. Grymonpre (2016) studied faculty development at a single institution and used both the AIPE and qualitative interviews to survey faculty before and after an intensive faculty development on IPE. While no significant changes were seen in the quantitative scale, the qualitative responses were significantly more positive following the experience. Olenick and Allen (2013) found that attitudes towards interprofessional education (as measured by the AIPE) was the most significant predictor of intent to engage in IPE. In the current study, AIPE scores increased for two-thirds of the participants. ATHCT scores increased for more than half of the participants, while scores did not change for 15% of the participants.

Moyce, Bigbee, and Keenan (2017) conducted a long-term faculty development program and surveyed two cohorts. The authors utilized all three scales adapted by Curran et al. (2007). Positive changes were found in median scores for all three scales. The median scores for the AIPE were lower than those found in the current study at pretest *Mdn* = 64 and posttest *Mdn* = 70 (Moyce et al., 2017, p. 130), while the current study saw *Mdn* = 72 for both pretest and posttest. The median scores for the ATHCT varied much the same as the current study, though with slightly great significant value. Their pretest *Mdn* = 58.5 and posttest *Mdn* = 63.0 (Moyce et al., 2017, p. 130), while the current study pretest *Mdn* = 61 and posttest *Mdn* = 65. Again, the current study's initial elevated pretest scores did not leave as much of a range for improvement.

While not directly evaluating impact on interprofessional education, Bell et al. (2014) conducted a mixed methods study surveying faculty, students, and actors used in a workshop designed to improve patient communication with an interprofessional group of students. The

authors found that faculty were initially hesitant in using simulated persons to guide an IPE experience with the objective of improved patient communication; however, the posttest scores indicated a greater appreciation for this approach. In the current study, the patients and family members were simulated persons, given both specific background information but also allowed to improvise within specific parameters to allow an effect of realism for the simulation. The improved, though not significant, attitudes toward interprofessional education following involvement may be in part due to the witnessing of the use of simulated persons in simulation to engage students in interprofessional communication.

Joynes (2018) interviewed 33 health care faculty regarding perceptions and barriers to IPE. An overwhelming response on faculty perceptions indicated the need for experiences in IPE versus teaching about it in the classroom setting. Loversidge and Demb (2015) similarly cited real world experiences of IPE as having greater value for students. The current study utilized simulated persons' encounters to provide opportunity for students to engage with patients and other health profession students over the course of a shift. A potential assumption is that the faculty in the current study may have had a slightly higher expectation of the interaction than seen in previous studies (Bell et al., 2014; Loversidge & Demb, 2015) due to the regular engagement of simulated persons in more of an improvisational role in simulation utilized in the current study's Center. Despite this elevated initial attitude, it is useful to note the positive, though not significant, shift in perceptions of the faculty studied following involvement that fits the framework of experiences desired by previous studies' faculty (Joynes, 2018; Loversidge & Demb, 2015).

As previously noted, following Kolb's experiential learning theory, Sim-IPE provides faculty with the ability to engage in concrete experience of planning and implementing an

experience with their students. The questionnaires provided faculty with a guided reflective observation. In alignment with student-based simulation-based IPE evaluation, the results of the pre- and post-screen in this study can show that reflections after simulation maintains elevated perceptions of IPE and teamwork. As has been previously noted, the most positive correlation to intent to engage in IPE is a positive attitude towards IPE (Olenick & Allen, 2013).

Implications

The available literature on faculty perception of simulation-based interprofessional education is very limited. Current published studies provide information on faculty attitudes towards interprofessional education as a whole (Gary et al., 2018; Hinderer et al., 2016). Some literature even considers the effects of faculty development on attitudes (Moyce et al., 2017). In the available studies, most health profession faculty are fairly positive, though improvements have been seen following professional development. There are currently no published studies exploring faculty perceptions of interprofessional education in relation to a simulation-based event. Current studies have recommended consideration of faculty involvement in IPE and exploration of the resultant changes in attitudes after involvement (Hoffman & Redman-Bentley, 2012). The baseline discovered in the current study can provide a foundation for future studies, as can the design of the simulation-based interprofessional experience.

Following a constructivist educational theory that emphasized the need for collaboration, Loversidge and Demb (2015) surveyed medical and nursing faculty at three midwestern universities. Interviews revealed thematic teaching following authentic experiences to provide the most valued learning experiences. These experiences allowed students to engage in authentic interprofessional behaviors with other disciplines followed by narrative reflections and debriefings by faculty. The faculty identified that taught, and even simulated activities, were not

as meaningful. This was reportedly due to the lack of faculty and student commitment to the experience. Barriers existed in faculty belief in the value of IPE as well as the time needed to properly implement activities. A strong initial evaluation of the faculty in this study provide a potential starting ground for positive IPE experiences.

The elevated response of faculty observed in the initial survey response could be due to a few factors. Accreditation standards are undergoing changes in all health and allied professions. The Interprofessional Education Collaborative (IPEC) was formed as a committee sponsored by the World Health Organization (WHO) to research and define the direction of IPE and released its first set of standards in 2011 (IPEC Expert Panel, 2011). Included in this expert panel were representatives from the founding disciplines accrediting organizations, nursing, dentistry, medicine, osteopathic medicine, pharmacy, and public health. Following the publication of the standards, and with the impact of the original research outlined by the WHO (2010) detailing the positive impact interprofessional practice and collaboration has on patient outcomes, many other health professions desired involvement in the future of interprofessional education. The 2016 update provided by IPEC found nine additional accrediting bodies joining the collaborative. Those professional accrediting included: podiatry, physical therapy, occupational therapy, psychiatry, veterinary, optometry, social work, physician assistant, and allied health. With the increased interest in the research, implementation, and outcomes of interprofessional education, standards of accreditation have begun to reflect this epistemological shift.

In a recent review of the accreditation standard of some of these organizations, all current published policies include some mention in competency, objective, and outcomes related to interprofessional education (Stoddard, Johnson, & Brownfield, 2019). With these requirements in the accrediting standards of most health professions continuing to emerge, administration of

health profession programs is being required to implement IPE into the curriculums of their schools and programs. As champions of education, faculty are then the next recipient of the emphasis on this programmatic requirement. Multiple studies on student perceptions and attitudes have shown improvement in understanding, knowledge, and skill acquisition within the competency domains outlined by IPEC (Riskiyana, Claramita, & Rahayu, 2018). Studies are beginning to show improvement in interprofessional practice following IPE with students as well (McNaughton, 2018). With these findings prevalent in the research, faculty are gaining both the evidence and the administrative insistence, if not also full support, to engage in IPE. This emphasis can cause an inflated view of the benefits and needs of interprofessional education. The ceiling effect observed in this study may be evidence of this shift in excitement over the pedagogy change.

Limitations

The primary limitation of this study was the sample size available. Over 250 students were involved in the event that spanned two days. However, only 35 faculty members were involved. Of those 35, 63% of the faculty participating completed both the pre- and post-event survey. As of publication, no other available literature discusses potential changes in attitudes of faculty members after involvement in a large-scale simulation-based interprofessional event. Though a low sample size is a limitation to external validity, any findings can suggest that faculty involved in a similar event within the current time will likely have similar responses.

A threat to internal validity included the faculty being largely positive in their initial assessment of interprofessional education. Elevated initial scores on a five-point Likert scale do not lend to an easy significance in change values. These initial positive attitudes could create a ceiling effect that should be considered and further weighed for values that may not change as

much following the event. As previously noted, accreditation standards require or are moving towards requiring IPE within all health profession programs (Stoddard et al., 2019). Due to these requirements, and current available results that Sim-IPE does improve students' perceptions of the IPEC competencies (Riskiyana et al., 2018), faculty may feel IPE is a necessary and beneficial pedagogy. It is important to consider this elevated initial response in future studies.

Further threat to external validity included the fact that all faculty sampled were from a single institution. Results from this study should be carefully considered when used in comparison to other institutions that do not exhibit the same demographics as studied here. The institution studied has over 30 academic programs in healthcare education, excluding medicine, but including nursing and pharmacy. The simulation center featured and their faculty serve the entire college, not solely one department or school. The simulation event involved some faculty from disciplines outside of the student disciplines involved, though all were healthcare educators.

Looking at the instrumentation, the ceiling effect created could be due to the limitations of the range within each question. A potential threat to internal validity, the scale was presented on a five-point Likert scale and the pre-event scoring averaged was 4.53 for the AIPE and 4.36 for ATHCT; room for improvement was limited to less than a point per item on the scale. If the scale had a wider range of choice, more improvement may have been seen. However, a change in available answers is not without its own limitations. Increasing the range of responses invited increased variability in responses. When considering reliability, increased availability of responses can cause variation in both internal and external survey response. As noted by Simms, Zelazny, Williams, and Bernstein (2019), increased range of response can invite variations in psychological distinctions of individuals taking the survey that are not consistent across the sample. Simms et al. also found that though validity does not seem to change with greater

number of responses, it is worthy to note that decreased variation of responses requires greater number of items to maintain validity and scale precision. Considering these results of both the available studies and their own, increasing the variation of responses could allow for greater noticeable changes, but the potential for decreased reliability and validity must also be considered. Results from this study cannot be generalized beyond this population.

A potential limitation of the research is also the study design. In repeated measure research it is assumed that no other factors are influencing the change in resultant data before and after the intervention (Warner, 2013). However, as more than just the complex simulation experience may have been involved in the perception of the faculty surveyed, this limitation of outside covariants cannot be completely excluded. Such contributing factors may be societal information regarding IPE within the College of Health Sciences or involvement in other IPE experiences within the window studied. In correlational research, small sample sizes can make data difficult to translate to other populations, especially in the presence of outliers (Warner, 2013). Though there were no extreme outliers, some outliers were present and the sample size was very small. This introduces type II error that can decrease the ability to confidently state that the null was not rejected. Further studies with larger sample sizes should be considered to better understand if there is a relationship between years of experience in IPE and attitudes towards IPE or healthcare teams. Due to these limitations, results of this study should not be generalized to other populations.

Recommendations for Future Research

In expectation of future studies, a few points should be considered. Mixed method studies have promoted more in-depth consideration of the specific changes when initial attitudes or scores are high (McNaughton, 2018). Dennis, Furness, Duggan, and Critchett (2017) noted

specific themes to interest in Sim-IPE following student engagement that further defined attitudes interpreted from the survey tools used in quantitative analysis. Gaining further insight into the current study's faculty post-event perceptions may provide definition into pre-event elevation in scores as well as valuable lessons learned within the event. Further, qualitative results can give definition to creation of a new instrument to collect faculty insight as separate from student-driven survey instruments. The two instruments utilized in this study compare well when considering both student and faculty perceptions of interprofessional education; however, gaining insight into faculty's perceptions of use of Sim-IPE to achieve this goal should be researched further.

One of the barriers to implementation of IPE is an unrealistic setting and application to real world (Beck Dallaghan, Hoffman, Lyden, & Bevil, 2016; McNaughton, 2018). Providing student opportunities to interact with multiple professions in a positive manner in the real-world setting has also proven difficult (Horsley et al., 2016). Large scale Sim-IPE can be difficult to plan and implement as it requires a significant amount of faculty involvement from multiple disciplines. However, the professions involved interact in a simulated environment formatted similarly to what is seen in clinical practice. This provided a high-fidelity learning environment with fully developed patient cases allowing students to immerse in a real-world setting while still controlling for negative outside influences.

"In addition to having students learn about each other, faculty members also must be trained about each other's scope of practice and the differences in their respective programs" (Kahaleh, Danielson, Franson, Nuffer, & Umland, 2015, p. 8). When designing an IPE program, faculty perceptions of not only IPE but its components as defined by IPEC (2016) should be considered. Considering these references, the following ideas should direct future related

research:

- Future studies with health profession faculty may explore the qualitative phenomenon of barriers as seen in literature in reference to involvement in a large-scale acute care IPE experience.
- As very little negative change was seen in attitudes, further studies replicating such a large-scale activity and involving an instrument that is more specific to identifying continued barriers in intent to utilize Sim-IPE would be beneficial for faculty development and simulation development.
- Future studies should explore changes in faculty's perceptions of barriers to implementation of IPE after involvement in a large-scale Sim-IPE.
- Further study into faculty's perceptions regarding their teamwork, communication, understanding of roles and responsibilities, and collaboration amongst faculty in other programs and how that is influenced by involvement in IPE events should also be considered in future research.

Conclusion

Faculty attitudes towards interprofessional education can effect students' perceptions of interprofessional education as well as intent to engage in IPE (Grymonpre, 2016; Johnson, Lynch, Lockeman, & Dow, 2015). Previous studies have investigated existing faculty attitudes towards interprofessional education and interprofessional teams and found predominantly positive scale scores (Al-Qahtani & Guraya, 2016; Hinderer et al., 2016). This study provided a comparison of scale scores before and after involvement in a large-scale simulation-based interprofessional experience, as well as correlation between years of previous IPE experience and post-event scale scores. Though the data analysis did not have statistically significant

results, the lack of significant decrease in scores should be considered as well as the overall scores from the involved faculty. This study provides a strong foundation for future large-scale Sim-IPE involvement by faculty. Future studies can expand the sample size to determine if the lack of change is standard or if there is variation when larger samples are considered. This study also provides a well-developed framework for large-scale Sim-IPE design. Continued studies on faculty attitudes towards simulation-based interprofessional education can seek to aid in faculty development that improves faculty engagement in IPE.

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APPENDICES

Appendix A: Attitudes Towards Interprofessional Education

Attitudes towards interprofessional education

We are interested in learning how you feel about the relevance of interprofessional education (i.e. shared learning activities involving students from more than one health care professional program) to students' development as health care professionals. Please indicate your level of agreement with each of the following statements, by checking the appropriate space following each statement.

Use the scale SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree.

STATEMENT:	SD	D	N	A	SA
1. Interprofessional learning will help students think positively about other health care professionals.	1	2	3	4	5
2. Clinical problem-solving can only be learned effectively when students are taught within their individual department/school. [a b]	5	4	3	2	1
3. Interprofessional learning before qualification will help health professional students to become better team-workers.	1	2	3	4	5
4. Patients would ultimately benefit if health care students worked together to solve patient problems.	1	2	3	4	5
5. Students in my professional group would benefit from working on small group	1	2	3	4	5

projects with other health care students.					
6. Communication skills should be learned with integrated classes of health care students.	1	2	3	4	5
7. Interprofessional learning will help to clarify the nature of patient problems for students.	1	2	3	4	5
8. It is not necessary for undergraduate health care students to learn together. [a]	5	4	3	2	1
9. Learning with students in other health professional schools helps undergraduates to become more effective members of a health care team.	1	2	3	4	5
10. Interprofessional learning among health care students will increase their ability to understand clinical problems.	1	2	3	4	5
11. Interprofessional learning will help students to understand their own professional limitations.	1	2	3	4	5
12. For small-group learning to work, students need to trust and respect each other.	1	2	3	4	5
13. Interprofessional learning among health professional students will help them to communicate better with patients and other professionals.	1	2	3	4	5
14. Team-working skills are essential for all health care students to learn.	1	2	3	4	5

15. Learning between health care students before qualification would improve working relationships after qualification.	1	2	3	4	5

Adapted from: Parsell, G and Bligh, J. The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Medical Education* 33(2): 95-100, 1999.

SCORING AND INTERPRETATION

All items are scored on a five-point scale, with a response of 'Strongly Disagree' receiving a value of 1 and a score of 'Strongly Agree receiving a score of 5.

[a] Indicates a negatively-worded, reverse-scored item; in calculating an overall mean score, 'Strongly Disagree' responses receive a score of 5, and 'Strongly Agree' responses receive a score of 1.

[b] Please note that this item was removed from analyses in Curran, Sharpe, Forristall and Flynn (2008) because it did not load onto the forced one-factor solution as reported.

Curran, V. R., Sharpe, D., Forristall, J., & Flynn, K. (2008). Attitudes of health sciences students towards interprofessional teamwork and education. *Learning in Health and Social Care, 7*(3), 146-156.

Appendix B: Attitudes Towards Interprofessional Health Care Teams

Attitudes towards interprofessional health care teams

We are interested in learning how you feel about interprofessional health care teams (i.e. participation of three or more professions in collaborative patient care). Please indicate your level of agreement with each of the following statements, by checking the appropriate space following each statement.

Use the scale SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree.

STATEMENT:	SD	D	N	A	SA
1. Patients/clients receiving interprofessional care are more likely than others to be treated as whole persons.	1	2	3	4	5
2. Developing an interprofessional patient/client care plan is excessively time consuming. *	5	4	3	2	1
3. The give and take among team members helps them make better patient/client care decisions.	1	2	3	4	5
4. The interprofessional approach makes the delivery of care more efficient.	1	2	3	4	5
5. Developing a patient/client care plan with other team members avoids errors in delivering care.	1	2	3	4	5
6. Working in an interprofessional manner unnecessarily complicates things most of the time. *	5	4	3	2	1
7. Working in an interprofessional environment keeps most health professionals enthusiastic and interested in their jobs.	1	2	3	4	5
8. The interprofessional approach improves the quality	1	2	3	4	5

of care to patients/clients.					
9. In most instances, the time required for interprofessional consultations could be better spent in other ways. *	5	4	3	2	1
10. Health professionals working as teams are more responsive than others to the emotional and financial needs of patients/clients.	1	2	3	4	5
11. The interprofessional approach permits health professionals to meet the needs of family caregivers as well as patients.	1	2	3	4	5
12. Having to report observations to a team helps team members better understand the work of other health professionals.	1	2	3	4	5
13. Hospital patients who receive interprofessional team care are better prepared for discharge than other patients.	1	2	3	4	5
14. Team meetings foster communication among team members from different professions or disciplines.	1	2	3	4	5

Scale adapted from: Heinemann, GD, Schmitt, MH, and Farrell, MP. Attitudes toward health care teams. In Heinemann, GD, and Zeiss, AM. (Eds.) Team performance in health care: Assessment and Development. (pp. 155-159). New York: Kluwer Academic/ Plenum Publishers, 2002.

SCORING AND INTERPRETATION: All items are scored on a five-point scale, with a response of 'Strongly Disagree' receiving a value of 1 and a response of 'Strongly Agree' receiving a score of 5.

* Indicates a negatively-worded, reverse-scored item; in calculating an overall mean score, 'Strongly Disagree' responses receive a score of 5, and 'Strongly Agree' responses receive a score of 1. Reverse-scored items (Nos. 2, 6, and 9) must be included where an overall mean score or subscale score for the scale is used.

Subscale Analyses: The AIPHCT Scale items were drawn from two subscales of the original publication (Heinemann, Schmitt, & Farrell). Three items (Nos. 2, 6, and 9) load onto the *Time Constraints* subscale; the remaining 11 items load onto the *Quality of Care* subscale.

Appendix C: Approval from Curran

RE: Use of the faculty modified RIPLS and ATHCT

Wed 8/8/2018, 2:39 PM

Ashe, Shannon
Inbox

Attitudes toward Interprofessional Health Care Teams scale.docx	Attitudes towards Interprofessional Education scale.docx
20 KB	23 KB

Show all 2 attachments (43 KB) Download all

Save all to OneDrive - Liberty University

Hi Shannon, permission granted, I am attaching the 2 scales we used in the survey for that study. Best of luck with your PhD research.

VERNON CURRAN, PHD | ASSOCIATE DEAN OF EDUCATIONAL DEVELOPMENT

Faculty of Medicine
Memorial University of Newfoundland
Health Sciences Centre | Room H2982
St. John's, Newfoundland | A1B 3V6

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From: Ashe, Shannon

Sent: August-08-18 3:50 PM

To: Curran, Vernon

Subject: Use of the faculty modified RIPLS and ATHCT

Good afternoon Dr. Curran.

My name is Shannon Ashe and I am a doctoral student at Liberty University in Lynchburg, VA. I am interested in faculty perceptions of IPE and would like to use two parts of your modified assessment tools for my dissertation. I am looking at the article you, Dr. Sharpe and Dr. Forristall authored in 2007 regarding faculty attitudes towards IPE as measured by adapted RIPLS and ATHCT questionnaires. The questions and validity scores are listed in the brief report in Medical Education. Would you be kind enough to grant me permission to utilize the updated terminology you used in this study to administer to my own faculty?

Thank you for your consideration.

Gratefully,

Shannon Ashe

Appendix D: Liberty University IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

September 27, 2019

Shannon Ashe

IRB Exemption 3988.092719: Attitudes of Health Profession Faculty Involved in a Simulation – Based Interprofessional Education Experience

Dear Shannon Ashe,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(4), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

(4) Secondary research for which consent is not required: Secondary research uses of identifiable private information or identifiable biospecimens, if at least one of the following criteria is met:

(ii) Information, which may include information about biospecimens, is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained directly or through identifiers linked to the subjects, the investigator does not contact the subjects, and the investigator will not re-identify subjects;

Please note that this exemption only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP

Administrative Chair of Institutional Research

Research Ethics Office

Liberty University | Training Champions for Christ since 1971

Appendix E: IRB Approval Samford University

Project Approval **Form**

Identification and Certification of Research Projects Involving Human Subjects

The Institutional Review Board (IRB) must complete this form for all applications for research and training grants, program projects and center grants, demonstration grants, fellowships, traineeships, awards, and other proposals which might involve the use of human research subjects independent of source of funding.

This form does not apply to applications for grants limited to the support of construction, alterations and renovations, or research resources.

PRINCIPAL INVESTIGATOR:

Shannon Ashe

PROJECT TITLE:

Attitudes of Health Profession Faculty Involved in a Simulation – Based

Interprofessional Education Experience

CHECK ALL THAT APPLY:

This is a training grant. The Institutional Review Board (IRB) must review each research project involving human subjects proposed by trainees separately.

☑ This application includes research involving human subjects.

☑ The IRB has reviewed and approved this application on 9/23/19 in accordance with Samford University's assurance approved by the United States Public Health Service. The project will be subject to annual continuing review as provided in that assurance.

This project received expedited review.

This project received full board review.

This application may include research involving human subjects. Review is pending by the IRB as provided by Samford's assurance. Completion of review will be certified by issuance of another APPROVAL FORM as soon as possible.

☑ Exemption from subject informed consent based on number(s): 1 2 3 ✓ 4 5 6

Date 9/23/19

IRB Committee Member

IRB Application # EXMT-N-19-F-1