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INTEGRATING INTERPROFESSIONAL EDUCATION CURRICULUM INTO A
VASCULAR SONOGRAPHY COURSE

by

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A capstone submitted in partial fulfillment of the requirements for the degree of
Masters of Arts in Education

Hamline University

St. Paul, Minnesota

Spring, 2018

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Do your dance
Why should you wait any longer?
Take a chance
It could only make you stronger
- Prince

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CHAPTER ONE

Introduction

Overview

Teaching in a health science program at a university has afforded me the opportunity to observe that students do not regularly interact with learners in programs other than their own. Educators create and deliver curriculum specific to their health science field, but do little to combine classrooms across disciplines to teach a true understanding of other areas of healthcare. There is inadequate effort in joining other areas to work in partnership to demonstrate and implement team-based care in a healthcare environment. I suspect that this lack of interaction leads to students' difficulties working collaboratively as a team after they leave the classroom. The lack of collaboration is why this capstone project will address interprofessional and collaborative learning and aid in answering the following question: *What are the benefits and challenges of integrating interprofessional education into vascular sonography coursework?* Addressing this capstone question will support me in creating learning opportunities to integrate students in the Sonography program with students in other health science programs to work together in a constructive way to foster advanced problem-solving skills and solid, successful patient care, improving patient health outcomes.

Teaching team-based care can be accomplished by integrating Interprofessional Education (IPE), a complementary curriculum that teaches students how to collaborate

with other health science students in different health programs into an already existing health science specific curriculum. The World Health Organization (2010) states that Interprofessional education (IPE) “occurs when two or more professions (students, residents, health workers) learn with, about, and from each other to enable effective collaboration and improve health outcomes” (p. 7). According to the National Center for Interprofessional Practice and Education (The “New” IPE, 2017), Interprofessional Education is about “improving health, creating support systems and trying different models of practice to achieve good healthcare outcomes once out in the clinical field” (p. 2). The curriculum intentionally supports those in the health community, including health professionals, health care workers, students, residents, patients, families and communities. Examining the challenges in teaching this curriculum is helpful in making the appropriate changes and connections to other fields in healthcare.

As an educator in a health science field, my experience has been that the current academic model has historically emphasized the importance of stringent information-heavy structure and schedule, which may prove to be challenging to create collaborative curriculum. At the university where I teach, typically course design has been explicitly to create a separate course for IPE. My goal for this capstone project is to integrate Interprofessional Education curriculum into my specific vascular coursework in the sonography program. Instead of creating an independent IPE class, I will write curriculum that threads interprofessional education throughout my vascular sonography courses.

Chapter One discusses the research background for creating Interprofessional curriculum, including personal experiences that led to the motivation surrounding this

work. Chapter One also provides a research rationale for developing intercollaborative and Interprofessional curriculum in a university health science class. It explains my role as an educator and as a healthcare practitioner, providing a unique lens to view Interprofessional education as a needed addition for the classroom, which allows students to take those skills and use them in a clinical setting. Finally, this chapter gives a brief summation of what is discussed and provides information on looking forward to chapters Two, Three, and Four. This chapter begins with imperative background information needed to understand the origins of this work.

Researcher Background

I have worked in healthcare since 1993. I love working with patients. I have always felt valued in that I have been part of a team of people that can identify pathologies and aid in the treatment plan of patients. My first job in ultrasound was working at the University of Minnesota Hospital performing exams that were primarily vascular and organ transplant related. In 1995 at the University of Minnesota, it was a common occurrence to see providers collaborate to find solutions for difficult cases, but I found that this collaboration was done only at the physician level. Those that worked in other areas of the patients' care, areas where discoveries were made about their health, were not being included in the treatment plan or process.

Perhaps, collectively bringing together other areas of expertise in this collaborative process could be used if physicians could cross over other disciplines of care and work with not only other physicians, but with other members of the healthcare team such as those that work in nursing, imaging staff, the pharmacy, and the laboratory to discuss patients as a true team. This, in turn, may provide the physicians and the

patient, along with all other areas of the clinical field, a clearer and larger picture of the patients' treatments and outcomes, in turn allowing better decision-making and overall better health for the patient. How can this be accomplished? Working together to better understand each other's fields and developing teamwork, communication and collaborative skills that will foster a team-based care approach would greatly improve healthcare outcomes.

I immediately knew I made the right choice to go into healthcare when I entered my radiology (ultrasound) program at the University of Minnesota. I loved every aspect of patient care. It satisfied my need to be challenged and feel valued in my future career. As I reflect back on the events that attracted me to a healthcare field, I soon realized my desire to help take care of patients, and that doing this collaboratively made sense. I became aware of the absence and the necessity for team-based care even before I entered college. Personal experiences in our past affect how we move forward in our lives.

I have vivid memories of my grandfather and his experience in healthcare in the early 1980s. Having been very close with him, I witnessed him navigate through a very long, confusing, and fragmented health system in which to treat his ongoing heart disease. Not quite knowing that I would enter into the healthcare field at the time (I was 15), I recognized and experienced the frustration that existed in patients and families who had little knowledge about the healthcare system. We relied so heavily on my grandfather's doctors to help guide us to keep him healthy.

Toward the end of his battle with heart disease, it became increasingly more difficult to get a true understanding of what could be done to help keep him in control of

his own health and also keep the family updated on the process of the disease. There were so many differing opinions, instructions, and treatments that were continuously being given from many different caregivers. I remember the frustration my family felt about what were the right answers in all of these opinions and instructions that were given. We frequently asked the question, “Why couldn’t they all get on the same page and give us some solid answers?” There were meetings with the care team and my family, but the care team only consisted of a couple of cardiologists and at times a nurse that had been working with my grandfather.

I remember thinking that all of those providers that helped him in his daily care were not there to provide us with more information. Social work, physical therapy, laboratory staff, imaging specialists, pharmacy had all been an integral part of my grandfather’s care, contributing to the giant puzzle of how to map out his future treatment plan. I believe that including these providers would have helped my family through a very difficult journey. In reflecting on these past experiences, it became apparent to me why I entered the healthcare field.

I began working in ultrasound at the University of Minnesota Hospital in 1993. I loved the collaborative process that my colleagues and I developed, but joining forces with other healthcare providers did not exist. We worked in our own clinical silos with very little interaction with other areas in the hospital. Information that we acquired about patients was given to other practitioners, but I never felt part of a broader healthcare team to help the patient. The lack of communication across separate areas of care did not make sense to me. Working in patient care at a University hospital was interesting because

it fulfilled a desire to work with patients and also be part of a teaching environment. It was an inherent transition for me to include education in my career.

I began teaching ultrasound in 2005. After trying my hand at department administration, I realized that one of the most rewarding aspects of my job in patient care was teaching residents and students in their clinical sonography internships. It became a natural progression to begin teaching in the sonography program. As I became more involved with my program I discovered that, similarly to my patient care experiences, faculty in my program were not collaborating with other programs to teach a more team-based approach. We were working in those same silos as I had worked in the clinical environment. It was a common understanding that there was little time to collaborate on curriculum and department goals with educators in other areas.

I specifically remember a time when I inquired about reaching out to educators in other health science programs in the community; those that were involved in sonography but not at the same university that I work. I found that educators were not willingly offering to meet or collaborate. There was an underlying competitive attitude and a fear of losing clinical internship sites in the Twin Cities if we were to speak to others in different programs. In my experience, I found that this prevented them from working with others in the community. This, again motivated me to implement a solution to teach students how to collaborate so that they may use this skill in their future healthcare fields.

Research Rationale

I currently work in both an academic and healthcare arena. I am still part of the sonography faculty and I have recently returned to the University of Minnesota Clinic and Surgery Center, primarily performing general and vascular ultrasound. Being a part

of both of these fields gives me a unique perspective on how teaching interprofessional education is greatly needed in today's healthcare environment.

In talking with my colleagues in the clinic, I have quickly realized that they share my same concerns for needing a more team-based approach to patient care. In our everyday experiences at work we have discussed specific occasions where there has been miscommunication among different areas within the health center to perform specific studies on patients. My colleagues have expressed to me a desire to better communicate and interact with the vascular surgeons and supporting staff to more effectively serve the patients' needs stating, "If only the vascular practitioners could spend some time in our department to see exactly what we do and how we can answer their questions about patients and the exams that they order." We have also spoken of the desire to spend time in the vascular surgery department to see how our role in the patients' care affects their care plan. By crossing over into each other's departments, we will gain a better understanding of what each area of expertise does. We all may effectively contribute to better patient outcomes.

Developing a better understanding of one another's role in the patient care process has also proven successful in reducing a number of mistakes in performing an exam on a patient that may not be needed (WHO, 2010) . There are many examples in my career where an unnecessary ultrasound was ordered on a patient. When an exam is ordered, sonographers perform a specific protocol to include images that correlate with that exam. Often, there are particular answers to a question that the ordering physician needs, but are not expressed in the order. Instead, whoever orders the exam for the patient (the nurse or support staff working with the ordering clinician) automatically enters an order for the

ultrasound that they think will give the information the doctor wants. I have discovered that when other specialties do not know what kind of studies we do, this prevents the staff from accurately ordering what is needed for the patient. The patient may receive the exam that was ordered (the wrong exam), questions may not be adequately answered, and the patient often times may need to return to have another exam performed.

In my experience as a healthcare practitioner, I have observed that this scenario happens frequently in areas of healthcare other than ultrasound. Perhaps these mistakes could be eliminated by developing a minimal awareness and understanding among staff of how exams can give solutions to different types of questions that need answering about their patients. Conversely, if we as sonographers have a better understanding of the clinical process during the patient visit with the physician, we may have a more accurate approach to our studies for any particular patient. Actually spending some time in one another's departments to observe what is done in each modality. I believe that this team-based care begins with communication and collaboration and can be taught in a classroom. The World Health Organization (2010) supports my position.

The World Health Organization (2010) states that interprofessional education is an experience that "occurs when students from two or more professions learn about, from and with each other" (p. 7). This statement may seem like a simple concept that the general population most likely believes is already successfully implemented in the healthcare arena. When the public seeks out medical care, they are hopeful that they are receiving the best possible attention from all providers in the clinical setting. The nurses, doctors, and support staff are in communication to find the best solutions for the patient. Having worked in this environment for many years, I have experienced that this needs

much improvement, specifically in ultrasound imaging, and this is what I will address in the capstone. Those of us that enter this profession have a genuine interest in problem-solving and patient care, and yet we are provided with minimal instruction on working with others in medicine to provide the best patient care.

Summary

I have the unique role of simultaneously working in the clinical environment and educating sonography students entering in this field. I am able to assess the needs of the healthcare community and respond to those needs through teaching those that will be employed in it. Addressing these challenges and demonstrating the benefits of team-based care in the classroom before students hit the clinical environment will help them transition into their profession more prepared for success.

I work in a sonography program that is designed to provide didactic and experiential learning. An integrated model of traditional classes that include lectures and labs along with clinical internships is used. Like most healthcare programs, the clinical component is a vital part of their education. Students are asked to apply what they learn in the classroom to a clinical environment. This goal is critical to their academic and professional success. They are in the program to specifically achieve these objectives. I see the experiential component of the curriculum as needing the most instruction when trying to integrate interprofessional education curriculum into my class. Creating innovative interprofessional education curriculum that I can simultaneously deliver with my vascular ultrasound curriculum could provide students with opportunities to learn and practice skills that will improve their ability to communicate and collaborate with those already out in the healthcare setting.

Students first need to learn how to effectively communicate and work together and then branch out to collaborate with other groups. Helping them develop the necessary communication and collaborative skills will also help change the clinical environment they will enter that is slow to embrace this positive change. While integrating this new curriculum to my vascular ultrasound course, I can eventually evaluate the impact it has on my students' ability to collaborate and lead, rather than delivering this curriculum in a separate course.

Looking Forward

What are the benefits and challenges of integrating interprofessional education into vascular sonography coursework? Chapter Two will explore the body of research relevant to this question. Chapter Three will examine the benefits and challenges of weaving interprofessional education in my vascular sonography curriculum and how it pertains to both the academic and clinical setting. Chapter Four will include curriculum created to integrate into the already existing vascular sonography lesson plans, teaching communication and collaboration in a healthcare environment.

CHAPTER TWO

Literature Review

Overview

Chapter One reviews my individual experiences and journey that led to the impetus for this capstone. Chapter One also examines the research rationale for developing curriculum that includes interprofessional education and intercollaborative practice. In an effort to answer the question: *What are the benefits and challenges of integrating Interprofessional education into vascular sonography coursework*, Chapter Two provides an in-depth literature review that supports the need to develop Interprofessional and intercollaborative curriculum.

Chapter Two provides a literature review examining collaborative learning, giving a comprehensive evaluation of a historical review on how collaborative learning has been studied and how it has benefited the learning community. This section will help the reader understand the foundational framework by which Interprofessional education has been created. Chapter Two also investigates the difference between cooperative learning and collaboration, offering the reader an opportunity to better understand the transformation of Interprofessional education and how it relates to collaborative learning. This chapter also outlines how collaborative work models may be translated into a health science academic environment. This will help the reader make the connections to creating

Interprofessional education curriculum that can benefit students when they begin their work in the healthcare community.

Chapter Two then provides a detailed summation of what Interprofessional education (IPE) is and how it relates to the Institute of Healthcare Improvement's Triple Aim Initiative. This chapter explores research in teaching and learning strategies for Interprofessional education and how IPE has impacted the Triple Aim initiative, helping the reader to make connections on how the IPE curriculum design may aid in the success of the Triple Aim Initiative; a plan to improve patient care and reduce healthcare costs. Chapter Two also addresses factors affecting Interprofessional Education (IPE). It provides an examination on research conducted surrounding structural barriers, particularly in a uni-professional clinical setting as well as exploring curricular development challenges, dividing these challenges into micro-level, meso-level, and macro-level factors affecting the success of IPE. This portion of the chapter will help the reader to recognize the influences at different levels that the challenges and benefits of this capstone project may encounter.

Research surrounding curricular goals is investigated in Chapter Two, offering examples of the changes that are required in an educational setting to modify healthcare delivery in a clinical setting. This section provides various models of how authors approach curriculum development in a variety of ways, incorporating IPE in their delivery. Included are recommendations on how implementing IPE may affect the healthcare community on macro-, meso-, and micro-levels. In this chapter, research has been reviewed on how a medium-sized university and a diagnostic imaging program in a technology institute applies IPE curriculum. This section will help the reader to

understand how, once it is completed, the integrated curriculum may resolve some of the issues surrounding how it is currently delivered in other educational institutions.

Finally, Chapter Two provides a summary of the literature review and presents an introduction into the framework of the curricular design capstone project.

Collaborative Learning

Interprofessional education (IPE) provides students with opportunities to learn and practice skills that improve their ability to communicate and collaborate. To better understand how IPE works, we must first examine the concepts of cooperative and collaborative learning. This examination starts with a brief historical overview how the concepts of cooperative and collaborative learning became associated with education. Ashmand and Gillies (2013) cite John Dewey in stating that he believed that education was a process of living and that it was the responsibility of schools to develop children's interests and help them expand learning through new ideas and influences. The authors continue to describe how Dewey expressed that the process of learning should be active and dynamic. By interacting with others, Dewey's stance was that students would receive feedback on their activities, they would learn socially appropriate behaviors, and they would begin to understand what it means to work together and cooperate (as cited by Ashaman & Gillies, 2013). Ashman and Gillies (2013) also depict how Dewey's groundbreaking ideas had a great influence on current education, particularly in the area of collaborative process and Interprofessional education.

Ashman and Gillies (2013) describe two studies that were performed during the 1920s and 1930s regarding individual's behaviors and how the group dynamic changed those behaviors. Through various investigations, Mead (as cited by Ashman & Gillies,

2013) witnessed that people worked cooperatively when they pursued mutual outcomes, and May and Doob (as cited by Ashman & Gillies, 2013) observed that individuals cooperate when they are in close contact and work together to achieve that same goal (Ashman & Gillies, 2013). These investigations can also be translated to the health science field. Working cooperatively in a clinical setting is a goal that is pursued as a mutual outcome; helping the patient.

Ashman and Gillies (2013) cite the published 1982 study results of Johnson and colleagues of confirming that cooperation promotes higher achievement and productivity than interpersonal competition or working individually. These results were consistent across all subject areas and for all age groups. In a follow-up analysis of various studies, Ashman and Gillies cite Johnson's findings that working in cooperative groups promoted greater interpersonal collaboration among student of all different races, genders, and cultural backgrounds. One can surmise that these studies validate how positive cooperative learning transcends across gender, racial, and culturally diverse lines; a very important point to make when thinking about students needing to work together in a health science field. This is valuable evidence when teaching racially and culturally diverse students to take care of a racially and culturally diverse patient population.

Studies have also been conducted on making the connection between interaction (cooperation) and achievement. Ashman and Gillies (2013) cite investigators Webb et al. findings that children succeeded when given instructions in a timely manner and relevant to the student's questions and need for help, enabling the student to formulate a true understanding of the material. Webb and his colleagues further stated that when these conditions were met, children were more likely to continue to engage in problem-solving

tasks and were more likely to contribute to higher achievement outcomes, disregarding of any prior achievement or ability level.

However, Cohen (1994) does not agree collaborative and cooperative learning leads to increased achievement. Instead, Cohen (1994) argued that it is how regularly the task occurs and the interactions of these tasks that is related to achievement. These outcomes are consistent whether the focus is placed on the individual learner or on the group of students talking together as they work on a shared task (Ashman & Gillies, 2013). These outcomes may be further understood when looking at how various authors examine differences between cooperative and collaborative learning.

Differences Between Cooperative and Collaborative Learning

Barkley and Cross (2014) state that cooperative learning developed mainly as an alternative to what was seen as an overemphasis on competition in teaching traditionally in education. These authors describe how in 1996, Karl Smith, David Johnson and Roger Johnson introduced cooperative learning as a formal pedagogy in K-12. Barkley and Cross (2014) describe how Smith, Johnson, and Johnson advocated the idea that students working together to maximize their own learning along with others was conceived and should applied to higher education.

As cited by Barkley and Cross (2014), Smith et al. conducted research primarily about cooperative learning based on the assumption that the teacher has the knowledge about a given subject matter and is more the expert than the students. The authors assert that the responsibility of teachers is to design learning activities that guide students in gaining and deepening their own knowledge and expertise.

Barkley and Cross (2014) continue to cite Smith et al., stating that a specific interaction happens in group work that results in a process and outcome greater than what may have come from an individual student contribution. The studies also assume that the teacher (the expert on all content) is the authority in the classroom and is the only one responsible for designing learning tasks. Smith et al. state that they are also responsible for managing time, monitoring students' learning, and making sure students are on task (as cited by Barkley & Cross, 2014).

Researchers Davidson and Worsham (1992) agree on what cooperative learning is, and equally as important, what cooperative learning is not. These authors propose that cooperative learning is not having students simply sit next to one another and talk collectively while performing their individual assignments. It is also not about assigning a report to a group where one student does all of the work with the others signing their names to it. It is not just being physically near one another. Agreeing with Davidson and Worsham (1992) are Barkley and Cross (2014) who describe how cooperative learning is designed to actively engage students in the learning process and that this cooperation is achieved, according to Barkley and Cross (2014), through peer inquiry and discussion in small groups. They also note how group work is structured to promote participation of all members (Barkley & Cross, 2014).

Barkley and Cross (2014) offer Smith's five elements that are considered essential for successful cooperative learning groups:

1. Positive interdependence: the success of the individual student and the group are interrelated. Students succeed when the group succeeds, thus motivating one another to help accomplish goals of the group.

2. Promote interaction: Students are expected to actively help one another. Members of the group share ideas and resources. They support and encourage others in the group to learn.
3. Individual and group accountability: All members of the group are held accountable for achieving its goals. Each student contributes their share of the work, and students are then assessed on an individual basis.
4. Development of teamwork skills: Students are required to learn interpersonal and small group skills to function as part of a team. Teamwork skills are taught purposefully just like academic skills.
5. Group processing: Students need to learn how to evaluate how productive their group can be. They need to know how to make decisions about what to continue or change in any given group.

Barkley and Cross (2015) cite a number of authors to support their thinking on collaborative learning including Kvale.

Kvale (as cited by Barkeley & Cross, 2015), in supporting the idea that collaborative learning stems from ideas surrounding the social constructivist theory, believes that reality is produced and understood through exchanges between people, shared objects, and activities as individuals make and experience their meanings together. Barkley and Cross (2015), through Kvale's work, warn that it is important to try to avoid having students become dependent on the teacher as the authority on the subject matter and the group process. Barkley and Cross (2015) continue by stating that it is not up to the teacher to monitor the group learning, but rather it is the teacher's responsibility to become a member, along with the students, of the community of learners in search for

knowledge. All are working together to create knowledge. This may easily translate into how to examine collaboration in healthcare.

Collaboration in Healthcare

How can collaborative work models be translated into a health science academic environment? What does it mean to work collaboratively in a healthcare environment? Equating collaboration to teamwork is what Thistlethwaite, Jackson, and Moran (2012) try to accomplish in their research. The authors write about deconstructing the term collaboration. They challenge the reader to view collaboration as having diverse meanings for anyone who considers what it is. They argue that collaboration may be considered as “the enemy” (2012, p. 54).

Thistlethwaite et al. (2012) provide examples that most healthcare practitioners can relate to; “I had to persuade the doctor to review the patient; I had to win over the nurse to my way of thinking” (p. 50). This idea of coercing as a team approach is worth noting in healthcare. The authors discuss words that are in opposition to collaboration (such as competitive, autonomy, and coercion), yet the question is, do healthcare professionals not need the coercive and opposing words and meanings to essentially create the collaborative environment? Having worked in a healthcare setting since 1993, it is my opinion that those autonomously-working professionals bring often opposing, professional views to the team, contributing to this coercive conversation. It is essential to ask, are they not a contributing factor to the collaborative practice; joining autonomous points of view (that can sometimes be competitive) to innovate, thus forming the collaborative team?

Thistlethwaite et al. (2012) present an interesting analogy, associating collaboration in healthcare to a child's development where play begins in parallel, progressing to simple social play, and finally grows into cooperative play. These authors suggest that perhaps healthcare collaboration represents the apex of interprofessional working, moving from uniprofessional to multiprofessional (parallel) to interprofessional (team, cooperation and collaboration). Thistlethwaite et al. (2012) also introduce a noteworthy argument.

The argument postulates that collaboration is necessary within a team. It is recognized as collaborative as long as each party involved benefits as a whole, working together to achieve a goal (correlating with Mead's work that is discussed earlier in this chapter). However, Thistlethwaite et al. (2012) question how this may "resonate with the whole philosophy of professionals in healthcare and professional autonomy from a self-regulating, healthcare agency point of view" (p. 52). Working in healthcare, I have observed, on a regular basis, that there is a dichotomy between defining the image of collaboration in the healthcare community among colleagues, and the territorial roles health professions often demonstrate in their own fields. Thistlethwaite et al. (2012) use the familiar term "turf wars" (p. 52) among health practitioners. Can health professionals share their knowledge and skills as a team while still maintaining their health system autonomy? These opposing ideas are what the authors question.

Thistlethwaite et al. (2012) express that collaboration has emerged as a distinct form of academic research that can extend into a teaching environment. A question that one may raise to the authors is whether these collaborative ideas are benefiting the patient and the team, or just the patient? One can propose that this may circle back to how

students can benefit from developing the teamwork skills necessary to collaborate in the healthcare community. Learning these skills may improve and resolve the problem of why it is so complex to collaborate, a key component to learning interprofessional collaborative education.

Overview Interprofessional Education (IPE) and the Triple Aim

The United States health system is one of the most expensive systems in the world. According to 2015 statistics, the U.S. spends twice what other developed countries spend per person on healthcare (Organization for Economic Cooperation and Development, 2015). Among the high costs of healthcare, quality of care has also come under intense examination. Beginning in 1999, the Institute of Medicine (IOM) revealed that nearly 100,000 people die each year because of medical errors. This report created incentive for review of all medical education and a call for significant revision (IOM, 1999).

Literature states that health care leaders, educators, and financial supporters have requested a collaborative, team-based health care workforce in response to the need to revise healthcare education. (NLN, 2015). Evidence suggests that effectively working in teams improves the quality of patient care (McNair, 2005). It has led to a desire to study how patient care and health costs may be improved.

In 2007, the Institute for Healthcare Improvement (IHI) developed the Triple Aim Initiative, a plan intended to improve patient care and reduce healthcare costs. The Triple Aim outcomes incorporate the realm of quality (the delivery of safe and effective care by healthcare teams), cost (including total cost and measures of utilization that push costs), and experiences (students/health providers working in interprofessional teams and

patients) (Berwick, 2008). This portion of Chapter Two discusses interprofessional education, supporting the case that IPE is important in strengthening health systems as seen through the Triple Aim lens.

The IHI Triple Aim Initiative describes a framework to optimize health system performance through team collaboration between multiple health disciplines (NLN, 2015). Berwick (2008) affirms that the components of the Triple Aim; improving the individual experience of care, improving the health of populations, and reducing the per capita cost, are not independent of one another. The changes that are made in pursuing one goal can affect the other two, either negatively or positively. Offering the following example that improving individual care can raise costs if the improvements include new, effective, but costly technologies or medications, proves that the goals are interdependent (Berwick et al., 2008). The Triple Aim, rather, is an exercise in balance, heavily depending on policy limitations, specifically decisions made regarding how much money to spend, what kind of coverage will be provided and to whom (Berwick et al., 2008).

Interprofessional Education and Intercollaborative Practice

In reading multiple studies, I have found that various researchers agree that interprofessional education aims to improve outcomes and the quality of patient care (specifically addressing the Triple Aim). For the purposes of this paper, it is important to clarify specific terms. Interprofessional education (IPE), as stated in Chapter One, is defined as an occasion when two or more professions learn from and about each other to improve collaboration and quality of care (WHO, 2010). Intercollaborative practice (ICP) is defined as a practice to promote active participation of each discipline in patient care. It improves patient and family centered goals, providing ways for continuous

communication among caregivers. It also optimizes health workers participation in the clinical decision-making process across multiple disciplines which fosters interdisciplinary respect among their peers (Oandasan & Reeves, 2005).

Oandasan and Reeves (2005) state that reflection is a key component of IPE teaching strategies. Students must wrestle with a number of complex issues related to leadership, role blurring, decision-making, communication, and respect, all of which do not have easy answers. Author Schon recommends that students need to be immersed in a practicum experience where they can engage in “reflection-in-action” (as cited by Oandasan & Reeves, 2005, p. 26). To teach reflection-in-action Oandasan and Reeves (2005) recommend the use of self- and group-reflective exercises, within safe learning environments so that students may begin to develop the reflective skills necessary for developing an understanding and appreciation of each other’s roles. This includes their unique backgrounds lending insight on their professional perspectives on clinical decision-making. Schwenk and Whitman assert that reflection can only occur if opportunities are provided for students that expose them to issues related to what they are struggling with (Oandasan & Reeves, 2005).

Oandasan and Reeves (2005) recommend that offering students relevant learning experiences is another key element, stating that learners’ reactions to IPE are more favorable when they see a direct relevance between their educational experiences and their future practices. The authors describe how it makes sense that IPE is located in higher level learning, particularly incorporating it in health science programs that integrate some form of clinical involvement (i.e. clinical rotations). A third phase of the

project will discuss how IPE may be incorporated into a clinical setting for sonography students.

Teaching and Learning Strategies for IPE

Researchers Oandasan and Reeves (2005) affirm that small group learning is an integral part of teaching interprofessional education, specifically focusing on using small group formats utilizing a case or problem-based approach. They note how the clinical problem that arises in a simulated or real patient exercise is the course through which learners come to an understanding of how to work together. Special consideration must be taken with group balance, group size, and group stability. Authors Gill and Ling (as cited by Oandasan & Reeves, 2005) suggest that a critical element in achieving group balance is to ensure that there is an equal mix of professional modalities. For effective learning to occur, Gill and Ling recommend that a learning group should not exceed 10 members, as problem related to poorer quality interactions can be encountered. Finally, interaction is enhanced if students work together within a group where there is a stable membership environment, with little member turnover (as cited by Oandasan & Reeves, 2005).

Research indicates that collaborative practice settings are also an important element to consider when teaching health science students. Oandasan and Reeves (2005) identify three ways that informal learning and community learning are important in building teams, in addition to teaching IPE in formal clinical settings. One type of informal learning is time outside of the classroom (i.e. in the local cafeteria or car-pooling together) can prove beneficial in sharing informal experiences among learners. Two, the authors also suggest it may be important to set aside time in the structured

learning environment in order to create informal learning opportunities. Three, students exposed to service-learning (structured learning experiences where students provide direct community service while simultaneously learning about the context in which the service is provided and understanding this connection) has helped meet the needs of both the community and the learners.

IPE Impact on The Triple Aim

Berwick, Nolan, and Whittington (2008) attest that the Triple Aim explicitly connects healthcare teams to providing better healthcare services, leading to better healthcare outcomes. However, has it been demonstrated that IPE impacts the goal of the Triple Aim? Authors suggest that despite a multiple-decade historical inquiry into interprofessional education and collaborative practice, researchers have not yet demonstrated the impact of IPE or collaborative practice on improving population health, improving the quality of delivered care and patient experience, or reducing healthcare costs (The Triple Aim components) (Brandt et al., 2014).

The need to foster research examining the impact of intercollaborative practice (ICP) and Interprofessional education (IPE) is a defining role of the United States National Center for Interprofessional Practice and Education at the University of Minnesota. In their research, the authors, in hopes of providing a starting point for the goals of the National Center (strengthening the evidence base for the effectiveness of IPE as well as creating new models of IPE and ICP), have conducted an extensive IPE literature review from 2008 through 2013, focusing primarily on determining the current state of IPE inquiry relative to the Triple Aim (Brandt et al., 2014).

Authors Brandt et al., (2014) revealed that the literature they reviewed focused on successfully relating IPE and ICP to the Triple Aim, but none of the research disclosed mapping any specific outcomes of ICP/IPE to those identified as the Triple Aim. They state that very little of the literature that was reviewed was aimed at population health or patient health outcomes, and none on the reduction of healthcare cost. While this seems disconcerting, perhaps asking the questions in new ways, as the authors suggest, allowing a collection and generation of new data may allow examination of this issue.

It is suggested that this is conceptually difficult in the context of challenging the idea that interprofessional education and collaboration may not have the impact as was originally believed. In other words, Brandt et al., (2014) question that given the complexity of the healthcare world, can training learners to work in an effective team ultimately lead to improved health outcomes or reduce cost of care? They go on to state that generalizable findings are key to IPE/ICP being realized. This means that generalizable findings must come from meticulous research and data analysis, requiring a serious commitment of resources, time and inquiry (Brandt et al., 2014). In reflecting on this study, it is interesting that in all of the research conducted on the impact of IPE/ICP on the Triple Aim, has not uncovered specific outcomes. However, it is my feeling that it does not diminish the importance of these connections. Perhaps further studies that will be constructed will identify the impact.

Factors Affecting Interprofessional Education (IPE)

Bridges et al., (2011) declare that Interprofessional education is a collaborative approach to develop healthcare students as future professional team members. They claim that complex medical issues can be best addressed by interprofessional teams and

teaching future healthcare providers to work in such teams will help facilitate this IPE model resulting in improved healthcare outcomes. However, many researchers state that numerous factors exist affecting successful delivery of Interprofessional education in a health science program. These challenges can limit educators to teach an authentic understanding of how to apply IPE once students enter the healthcare arena. This section of chapter two addresses these challenges and barriers influencing IPE implementation.

Structural Barriers

Authors McNair et al., (2001) state that structural factors between courses of multiple health science programs can create barriers to establishing and maintaining IPE education. They discuss timetable issues, money, and a lack of a collaborative history between and within schools as contributing to the impediments that exist (p. 21). The authors argue that course-based barriers to IPE programs include different levels of students, different teacher priorities and differing assessment methods all contributing to a deficiency in delivering IPE curriculum (McNair, et al., 2001).

McNair (2005) poses a unique viewpoint, offering an interesting component affecting IPE delivery. Citing the American Board of Internal Medicine (ABIM), researchers state that they have outlined a series of challenges to professionalism that contribute to preventing effective teamwork and interprofessional relationships. These challenges include the “abuse of power, greed, misrepresentation, lack of conscientiousness and conflicts of interest” (McNair, 2005, p. 457), all personal, value-based factors that emphasize the need for healthcare providers to reflect on their own behavior and how it may impact others (McNair, 2005). McNair argues that a uni-

professional approach to regulation, ethical standards and education has a strong effect on healthcare practitioners' interprofessional values that is not addressed (2005).

Uni-professionalism in the Clinical Setting

McNair (2005) defines uni-professionalism as “the pursuit of goals for single healthcare professional disciplines to the exclusion of other disciplines” (p. 458).

Researchers contend that uni-professionalism has its place, in part, to develop and pass on specific knowledge essential for effectively functioning of the healthcare system; it doesn't matter what discipline is addressed (McNair, 2005). However, the author argues that the power invested in having control over a specific body of knowledge can create a significant barrier to effective relationships with other professionals and with patients and therefore, undermines interprofessionalism (McNair, 2005).

McNair (2005) further declares that distinct boundaries have been elicited between knowledge of many healthcare disciplines when creating the various professional identities in the field. In reflecting on these statements, it appears that it may be counter instructive when healthcare professionals are required to widen their scope of practice in their various disciplines. The author continues by stating that “territorialism” (McNair, p. 458) can occur, which is particularly divisive within healthcare teams, making it difficult to effectively work in teams.

Exhibiting negative attitudes toward other healthcare professions can also undermine interprofessionalism (McNair, 2005). Researchers state that clinicians from an assorted number of disciplines, including doctors, nurses, dentists, radiographers and allied health professionals, display negative attitudes, attributing these behaviors partly to

the influence of attitudes that are expressed by their fellow clinicians, often contradicting what is learned in the classroom (McNair, 2005).

Curriculum development challenges

McNair (2005) asserts that despite urgings and pressures of the healthcare community and academic agencies to deliver interprofessional curriculum, inserting teamwork and professionalism into coursework is proving to be challenging. The author identifies three challenges/barriers. One barrier to the explicit teaching about values is an expectation that appropriate values will simply develop without the need for direction. A second barrier described by Howe (as cited by McNair, 2005, p. 460) is that professional development curricula within the health sciences suffer from a lack of structure to ensure that students gain professional competencies. The authors further convey that as educators for a healthcare professional practice, there needs to be a call for acknowledging among all disciplines, a contract that incorporates a framework which includes interprofessional values and behaviors (McNair, 2005). This presents a thought-provoking issue to include curricula that addresses behaviors and values to the vascular ultrasound coursework; something that was thought as already being included. It is a call to integrate and share values among health science students that can carry over into the patient care piece of health education.

Oandasan and Reeves (2005) convey an appealing approach to identifying factors that can affect the success of Interprofessional education delivery. In their findings, they subdivide these factors into issues directly related to the student (micro level factors), the

teaching environment (meso level factors), and the institutional environment (macro level factors) (Oandasan & Reeves, 2005).

Micro-level factors. Like McNair claims, Oandasan and Reeves (2005) argue that training health disciplines separately, while it plays an important role in developing needed skills, knowledge and confidence in their specific specialty, it certainly affects the socialization process in healthcare and can play an important role in how they approach interprofessional collaboration. These differing types of professional knowledge can create distinctly different professional cultures, that can isolate disciplines from one another which can impede collaborative learning. As a result, students go through their programs with stereotypes of their own professional identities and those of other health science disciplines, impacting the successes of IPE (Oandasan & Reeves, 2005).

Oandasan and Reeves (2005) also suggest the importance of recognizing an individual's own attitudes and stereotypes which may negatively impact the delivery of IPE. It is an important point that the authors make that examining the impact of IPE on the socialization process could increase opportunities for students to learn together and begin to collaborate more effectively. This may diminish early negative stereotypes and positively influence the development of more positive attitudes towards themselves and other health science disciplines (Oandasan & Reeves, 2005). This is a valuable idea when contemplating how to help foster positive attitudes among fellow sonography students and aid in developing encouraging mindsets when working interprofessionally with other health science disciplines.

Meso-level factors. Oandasan and Reeves (2005) argue that a major element of the success of IPE is the way interprofessional education is planned in the institution.

Identifying key partners and collaboratively planning with a clear initiative from the very beginning creates successful implementation of IPE.

However, another factor that researchers find can inhibit IPE development is that this type of activity is usually taken on top of the normal workload, implemented by a few committed faculty. Oandasan and Reeves (2005) argue that these staff will devote their time, energy and enthusiasm for IPE, and will willingly overcome the various logistical difficulties associated with developing the curricula. The authors cite Freeth in saying that this can pose a problem when key players move on. Group turnovers can occur, and leave this IPE initiative behind (Oandasan & Reeves, 2005). The success of this IPE plan heavily depends on the commitment of the faculty and the institutional leadership. Researchers state getting support from key administrators is vital to maintaining an IPE initiative because they hold power in shaping educational policy and resources (Oandasan & Reeves, 2005).

Macro-Level Factors. Finally, the authors argue that government support for IPE can help create the necessary incentive for schools to begin to create and embed IPE into each disciplinary field (Oandasan & Reeves, 2005). Researchers refer to the development of a “new core curriculum” (p. 43) that aimed to give everyone in the National Health Service in the United Kingdom the skills and knowledge for collaborative learning. This government policy provided the necessary political support for schools to provide IPE (Oandasan & Reeves, 2005).

Oandasan and Reeves (2005) also argue that accreditation, certification and licensing bodies influence academic institutions, leveraging ways to encourage health professional programs to adopt specific competencies which are felt needed to master to

provide the best care to patients. Researchers note specific agencies in both the United State and the United Kingdom that acted to promote change in curricula regarding IPE delivery (Oandasan & Reeves, 2005).

Curriculum Goals

As stated earlier in Chapter Two, the need for healthcare providers to deliver interprofessional care will require changes in how healthcare education is delivered. It will require a more integrated approach, eliminating working in health discipline silos. Sustainable development and implementation of IPE requires commitment from the faculty and the institution itself (Grymonpre et al., 2016). This chapter examines how various healthcare programs throughout the world deliver IPE curriculum. Several authors approach curriculum development in a variety of ways, implementing Interprofessional collaborative education through the lens of an entire health science program, collectively creating all-day IPE events for the entire school, while other authors describe a more intimate approach to teaching IPE, offering smaller activities to develop intercollaborative skills throughout the semester. However, authors that were researched agree that using a formal implementation framework, identifying key factors that must be addressed, was critical to organizing and implementing IPE. This section of chapter two explores the differences in their framework and curriculum delivery, providing a sampling of different programs implementing IPE into their health science coursework.

Authors Oandasan and Reeves argue that one of the most important outcomes relating to IPE is its impact on patients/clients (2005). Findings from their research revealed that there was no evidence for the effectiveness of IPE on patient/client

outcomes. They further conclude that perhaps utilizing a more inclusive approach to understanding the impact of IPE is the direction that needs to be taken (2005). In their literature review, the authors formulated imperative questions regarding the findings that aided in gathering a different perspective; ‘What are the interprofessional learning experience and processes of learning? What are the outcomes of interprofessional education, and how can the impact of IPE be measured?’ (Oandasan & Reeves, p. 44). Oandasan and Reeves state that little has changed in relation to evaluations or outcomes of IPE since their literature in review in 2002, however, there is more being learned about the components related to teaching IPE, while declaring that there is a continued need to develop and test effectiveness measurements through evaluation methods. They further assert that currently most studies have measured outcomes in the form of changes in attitudes as an evaluation method (Oandasan & Reeves, 2005).

University of Manitoba

Authors Grymonpre et al. (2016) affirm that the overall goal of Interprofessional education (IPE) is to modify behaviors and ways of working together to improve healthcare cost, health outcomes and patient/staff satisfaction. The authors propose a thought-provoking inquiry, stating that the framework for creating IPE curriculum must address micro, meso, and macro levels that factor into how successful and sustainable IPE will be, stating that transforming the classroom to an IPE complex requires “harmonization of motivations” (p. 76) within and between academia, healthcare delivery divisions, governments and consumers. They emphasize that IPE interventions occurring only at any single level will not lead to sustainable change.

As stated in their research, mapping their framework was guided by research performed by authors D'Amour and Oandasan (2005). These authors are cited stating that a critical component of this framework is the interdependency between the education and healthcare delivery systems. The framework allowed them to purposefully identify and address education and societal factors (discussed in detail earlier in this chapter) at the micro level, and influence change in structures and processes within their institution (meso), and within and between academia, clinical practice, government, and regulatory systems (macro) to effectively develop IPE learning opportunities (Grymonpre et al., 2016).

How did the University of Manitoba implement Interprofessional education into their health science programs? Citing D'Amour and Oandasan (2005), Grymonpre et al. (2016) used the Interprofessional education for collaborative patient-centered practice (IECPCP) framework. The authors discuss macro-level factors, meso-level factors, and micro-level factors that influence the advancement of IPE education in their school. They make their recommendations to the community, drawing from the lessons they learned in their research.

Macro-level recommendations. As stated earlier in Chapter Two, macro-level factors are factors that comprise the influences and decisions made by government and profession-specific policies, including accrediting organizations (Grymonpre et al., 2016). The authors offer the following recommendations on this level: 1) create partnerships with government, professional regulatory organizations and clinical practice communities (p. 79). There was little explanation as to why this was a necessary component in the research. However, one can speculate that creating these partnerships

would foster active partnerships between government agencies and the university to gain leverage for financial resources toward IPE, and to develop an understanding of what clinical practice communities need in their upcoming practitioners being taught in health science programs. 2) Use accreditation and education outcomes as leverage for change and self-reflection (p. 80). The authors cite Curran, Fleet, and Deacon stating that while not all health science programs have specific accreditation standards for IPE, most make an indirect reference by specifying a direct need for students to learn to communicate and collaborate as part of their professional responsibilities. They also state that accreditation standards also help educational institutions identify where further development may be needed.

Meso-level recommendations. Grymonpre et al. (2016) cites authors Oandasan and Reeves, stating that meso-level factors refer to the institution and organization structures and their respective leaders and representatives that enable the advancement of IPE. They offer the following recommendations on this level: 1) Create an organizational structure, stating that sustainable development and implementation of IPE requires institutional commitment. Requiring support from administrators is critical because they carry the responsibility of making decisions relevant to educational policy, resource distribution, and curriculum change (p. 82). 2) Take the time to develop and revise a strategic plan, allowing the participants to reach agreement on issues related to IPE (p. 83).

Micro-level recommendations. The authors, again, cite Oandasan and Reeves to express that micro-level factors refer to education and social factors that can aid or impede the acceptance of IPE, such as the cultural values of healthcare providers,

educators, and learners (Grymonpre et al., 2016). They offer the following recommendations on this level: 1) Adopt common frameworks and language (p. 84), stating that it is important to adopt general terminology while at the same time respecting embedded professional differences in a community that uses different vocabulary and terminology for IPE. 2) Encourage interprofessional planning for IPE, stating that interprofessional work groups were an effective way of developing and implementing interprofessional learning opportunities (p. 84). 3) Make faculty development a priority, stating that educators need the necessary knowledge, skills, and attitudes in order to effectively teach IPE (p. 84).

I found the authors support surrounding using macro, meso, and micro level factors to cultivate foundational IPE curriculum at the University of Manitoba intriguing. It has fostered reflection on how developing IPE curriculum to embed in the vascular ultrasound classroom will be challenging. It will require creative development in this intimate classroom setting in order for this collaborative work to be sustainable.

IPE in a Medium-sized University in the Southwest United States

Authors Parker et al. (2015) have researched performing IPE in a medium-sized, faith-based University in the Southwest U.S. They argue that a growing number of private and public organizations support schools and practitioners to embrace collaborative partnerships, departing from a “culture of silo-ism” (p. 112). They also state that a number of professional health education accrediting bodies include language mandating student involvement in IPE activities. Because of this language, students enrolled in these various health science programs are required to engage in IPE learning. In their study, the researchers describe steps to implement an interprofessional education

experience with five health professional schools within the University (Parker et al., 2015).

The authors, citing the Institute of Medicine (1972), discussed the educational team using the Core Competencies for Interprofessional Collaborative Practice as a theoretical framework for developing the IPE activity outcomes, which included: (1) to effectively collaborate with other healthcare professionals, (2) discuss current healthcare issues and the importance of healthcare teams in addressing the Triple Aim, (3) to develop trusting, working relationships with other professionals involved in assessing healthcare needs of patients, and (4) to demonstrate knowledge, skills, and abilities common to all healthcare professionals, leading to delivery of quality patient care (Parker et al., 2015).

The researchers chose a blended approach to curriculum delivery at this particular University; an interesting method that may be used in the newly developed curriculum created in chapter Four. The sequence of activities was designed in a six-week format, with three meetings being online, and the remaining sessions delivered face-to-face. Online instruction used videos and discussion activities, while the face-to-face meetings used nursing faculty acting as simulated patients. Students were broken up into teams and given a patient related case-based scenario. They were then given 20 minutes to interact with the “patient” and work through issues relating to the patient’s diagnosis. This was followed by a debriefing session while faculty observed in a separate room, through real-time video feeds (Parker et al., 2015).

To better understand how curriculum for a specific sonography vascular may be created, it is necessary to examine how other healthcare specialties developed IPE

curriculum. The authors discovered that implementing an IPE program across five healthcare disciplines proved to be challenging. They attest that it required problem-solving skills, creativity, and patience (Parker et al., 2015). Some of the findings among these disciplines were enlightening. For example, the researchers discuss that the Pharmacy program chose to implement the curriculum in the third-year student coursework because they had already completed specific modules pertaining to the patient assessment experience (Parker et al., 2015). They found that these students were the most appropriate candidates for the IPE experience because they had minimum foundational knowledge in evaluating cases and patient history, and they had been exposed to drug-literature, patient therapy and had been “trained on optimizing the patient’s therapy” (p. 115). This is an interesting point that the author expresses. Perhaps IPE is more successful and sustainable when students are more advanced in their program-specific coursework. They are better prepared to participate in the collaborative discussions needed to help problem-solve in these case-based scenarios. This is beneficial information when contemplating the most effective methods to introduce IPE into a vascular ultrasound course. Students in this course are in their final didactic year in the program, offering more expertise in their field, compared to those students just beginning their ultrasound training. Other health science disciplines offered interesting findings as well. The Optometry department incorporated the IPE experience within their pre-existing clinical internship courses that students take during their final two years (Parker et al., 2015). This is also informative in that those students are already out in a clinical setting, observing patient care with professionals. Perhaps they bring more knowledge

and collaborative skills than those that are in their first and second year of Optometry training.

Some important findings in the author's research that has influenced my curriculum design process is worth noting. Parker et al. (2015) learned that many students from multiple disciplines were willing to volunteer time and effort (even without credit given) to learn about interprofessional collaborative care. They also discovered that they were able to develop a workable model for the University, using a blended approach of IPE instruction, assisting with difficulties in scheduling multiple disciplines to participate. The researchers also discovered excellent strategies, particularly with patient simulation, that they could incorporate into the IPE experience, allowing for good participation from students and faculty. Also, faculty that participated in the IPE event increased their knowledge and readily embraced the concepts, demonstrating a willingness to sustain the engagement over a three-year period (Parker et al., 2015).

IPE in a Diagnostic Imaging Program

Researcher Grant (2014) created a Scholarship of Teaching and Learning-funded project engaging Sonography students at the Northern Alberta Institute of Technology in Edmonton, Alberta, Canada. The author used a simulation scenario focused on delivering IPE curriculum focusing on delivering bad news (fetal death) to expectant parents. Grant's (2014) intended learning outcomes were for the students to become informed of interprofessional relationships and learn how to perform in an emotionally charged interprofessional setting.

Grant (2014) created a half-day IPE event, simulating a clinical setting, including one patient (pregnant woman), a partner who came with the patient, two sonography

students, and one radiology physician resident. A scenario was crafted, allowing the interaction of the sonographer and radiology resident with the patient in an event that poor medical news was given. Patient reactions were scripted, forcing the sonography student and the medical resident to work together assisting the grieving couple, providing answers to their questions. Grant (2014) also included a facilitated debriefing session after the simulation, allowing the sonography students and radiology residents to share their experiences. Larger group discussions were conducted after the session, so according to Grant (2014) the group could discuss some of the themes that emerged during individual debriefing sessions.

The author states that the focus of the study was to determine if an IPE module simulation had a positive effect on the attitudes of the participating sonography students in collaborating with the radiology medical residents in a stressful clinical scenario (Grant, 2014). Their data revealed that interprofessional education positively affected students' attitudes toward learning together with the residents. They postulated that by participating in the activity, the students found a greater value in collaborative learning (Grant, 2015).

However, does Grant's study fit the definition of an IPE event? The author delivers some interesting research, particularly pertaining to my work in that it involves an imaging service related IPE event (sonography). It is questionable whether this research is regarded as an Interprofessional collaborative study. The definition of Interprofessional education and collaboration is a process in which "students from two or more professions learn with, from and about each other to improve collaboration and quality of care" (WHO, 2010). The groups involved in this study come from the same

discipline (Radiology). The study is informative on how to interact with patients in a high stress scenario, but there is little discussion given to how the radiology medical resident and the sonographers problem-solve together, offering their expertise to one another to better serve the patient.

Summary

Chapter Two has provided an extensive literature review, helping to answer the capstone question: *What are the benefits and challenges of integrating Interprofessional education (IPE) into vascular sonography curriculum?* It has explored literature examining what is collaborative learning, investigating the differences between cooperative and collaborative knowledge, and researching how collaborative work models may be translated into a health science academic program. Chapter Two discussed research performed on what Interprofessional education (IPE) is and how it may impact the Triple Aim Initiative, created by the Institute of Healthcare Improvement.

This chapter has also examined research surrounding factors affecting IPE and investigated curricular goals in the educational setting required to modify healthcare delivery in the clinical setting, providing various models of IPE delivery.

Chapter Three will focus on the methodology used in integrating Interprofessional education curriculum in vascular sonography coursework. It will include a description of the curriculum, and a review of the research paradigm used to develop this capstone project. It will also describe the research setting and its participants along with the potential benefits for the target audience, along with a timeline for completing the Interprofessional curriculum to be embedded into the vascular sonography curriculum.

CHAPTER THREE

Project

Introduction

Chapter Two provided a comprehensive literature review surrounding the framework of helping to answer the following question: *What are the benefits and challenges of integrating Interprofessional education into vascular sonography coursework?* Chapter Three addresses the methodology used in creating this capstone project; creating Interprofessional education curriculum to apply to already existing vascular sonography courses. It includes a comprehensive description of the developed coursework, with the program divided into three phases implemented throughout the sonography program. Chapter Three reviews the research paradigm used to develop the capstone project. It describes the research setting where the new curriculum will be used and the potential benefits for the target audience. Finally, Chapter Three begins with a thorough description of this curricular project.

Project Description

The capstone project aims to weave Interprofessional education (IPE) curriculum into current vascular sonography lesson plans in a private university setting. IPE has traditionally been introduced and implemented into health science programs as an all-day or weekend event with multiple disciplines participating (Parker et al., 2015). As stated in Chapter Two, research supports that IPE is more successful when introducing it to students who are at the end of their health science programs because they have had more

coursework in their specialty field than students just beginning the program (Parker et al., 2015).

This project seeks to teach intercollaborative practice and team-based care to sonography students that must learn how to work with other imaging disciplines within Radiology. Sonographers working in a healthcare setting depend heavily on the knowledge of other imaging modalities to accurately locate pathology in a patient. Learning how to recognize pathology from a magnetic resonance imaging (MRI) study to locate it on an ultrasound or to follow up a computed tomography (CT) exam to assess a finding is critical to the sonographer's success. This knowledge can come from learning with and from their imaging peers in the classroom before they enter the clinical world.

While introducing Interprofessional education to university juniors and seniors makes sense because they have already received didactic training in their disciplines, it is assumed that students already come to the IPE events with the collaborative skills necessary to participate. The newly developed curriculum cultivates collaborative learning skills in three phases during students' coursework, with specific application to their case study and clinical work before they are expected to collaborate interprofessionally within the clinical setting.

This project concentrates primarily on the first two phases with curriculum designed specifically for a vascular sonography course in the fall semester of a sonography program at a private university. Intercollaborative practice will be taught in the classroom specifically for application to imaging-based disciplines, to be employed in a clinical setting in the future.

Phase One. Phase one of the curriculum contains lesson plans that teach students how to collaborate with one another in the classroom. This includes simulation and exercises found in an authentic healthcare setting, while concurrently learning the necessary vascular anatomy and physiology curriculum. The exercises are designed to aid in building confidence in students' expertise in vascular ultrasound while simultaneously developing trusting relationships with their peers, which in turn, creates trusting relationships with students in other healthcare disciplines that they will work with in a clinical setting.

The newly designed curriculum integrates the foundational information given for vascular sonography, focusing on anatomy, physiology and pathology of the arterial and venous systems, with a collaborative teaching and learning approach for each specific unit. Students will work in groups among their peers in the classroom learning team strategies and tools to enhance collaborative performance that they will take with them into a patient care setting. Students will master key principles; team structure, communication, leadership, situation monitoring, and mutual support that will guide them in learning vascular sonography. These key principles are the basis for optimum patient care and safety once they enter the clinical setting.

Phase One occurs in the vascular sonography course at the beginning of the semester. Team-based exercises help transition the students to phase two of the curriculum; a more interprofessional curriculum introduced toward the end of the semester.

Phase Two. Phase two of the curriculum development incorporates collaborative exercises with health science students of other imaging disciplines within Radiology.

Students from general radiography, interventional radiography, computed tomography (CT), and students learning magnetic resonance imaging (MRI) join the sonography students in the classroom.

Students work side by side and engage in exercises and discussions that include case-based assignments to learn how to identify vascular anatomy and pathology and how it may be correlated with other forms of imaging. They build on the collaborative skills learned in phase one at the beginning of the semester, with the added component of collaborating with students in other imaging modalities. This capstone focuses on the first two phases, however a possible plan to implement this intercollaborative work in the clinical setting for phase three will briefly be discussed to move forward.

A look ahead to Phase Three. Phase three curriculum may be designed to be used during clinical internships. A majority of health science programs require clinical internships to enhance the didactic learning of their field. These students are concurrently housed in medical facilities, learning in their specific disciplines. The curriculum may include gathering students from various modalities to discuss current case studies that they have encountered from patients at their facility. Students are given the opportunity to collaborate with others in a real healthcare setting to build relationships with other disciplines, cultivating trust and respect among those with diverse expertise.

Evaluation. Establishing a solid technique to assess students in all three phases of the developed curriculum is vital. Evaluative tools will be created to aid in assessing students' ability to collectively collaborate with their classmates, with other teams of healthcare disciplines, and with clinical partners in their internship throughout their final

three semesters in the sonography program, with specific focus in the vascular sonography courses.

Participants and Setting

The sonography program consists of a cohort of approximately 17 students. The curriculum is written for the cohort of students in their final semester of the program, before they enter their clinical internships in a healthcare setting. Phase one curriculum includes the students in the sonography course, developed for the first half of the semester. The curriculum created for phase two expands to include students from other imaging disciplines within Radiology, including general radiography, computed tomography (CT), and magnetic resonance imaging (MRI) during the second half of the vascular sonography course. In looking ahead, phase three may include students participating in clinical internships. It may incorporate curriculum aimed at sonography students, as well as other health science disciplines already housed in the various hospitals and clinics.

Research Paradigm and Learning Theories

Situated learning theory. Interprofessional education draws from a number of learning theories. Literature also supports that Interprofessional education is most effective when learning methods reflect real world practice experiences of students, and when interactions between students of different disciplines occur. For the purpose of this capstone project, Situated Learning Theory (Lave & Wenger, 1991) and concepts of collaborative learning environments (Lave & Wenger, 1991) provide the framework for this curricular development. By using a realistic case scenario and reproducing a situation where a sonography student and a student from another discipline typically communicate

and collaborate with each other, it becomes an opportunity for students to apply and practice IPE.

Situations shape how we learn and who we are. Lave and Wenger (1991) asserted in the Situated Learning Theory that learning is embedded within an activity, context, and culture. Rather than looking at learning as the acquiring specific forms of knowledge, Lave and Wenger (1991) identify learning in social relationships; situations where there is participation involving multiple learners. This participation involves an active process on the part of individuals as they practice within social communities and form identities in relation to these communities. Learning is seen as more than an acquisition of knowledge by individuals. It is a process of social participation (Lave & Wenger, 1991).

Social interaction and collaboration are essential components of situated learning. Lave and Wenger (1991) state that students become involved in a community of practice that expresses beliefs and behaviors achieved through interaction. Understanding of individual roles, roles of other professions, teamwork and collaboration are achieved through this practice in the community. Opportunities for learning are structured by the requirements of work and apprentices often learn from other apprentices (Lave & Wenger, 1991). The shared practice within a community includes sharing information about ongoing activities. For health science students, this is accomplished in a classroom with their peers and in a clinical setting as a member of an Interprofessional team.

Understanding by Design (UbD). Wiggins and McTighe's (2000) model, Understanding by Design (UbD) is used as the basic framework for constructing the curriculum. The primary goal of Wiggins and McTighe's (2000) UbD plan is to teach and develop a deeper understanding of the content knowledge and autonomously transfer

students learning through their performance. Wiggins and McTighe's (2000) UbD offers a three-stage backward design process to purposefully plan curriculum. By starting with the end (the desired goals or standards), Wiggins and McTighe (2000) argue that educational objectives become the criteria by which materials are selected, content is outlined, instruction is developed and exams are prepared, providing a planning sequence for the curriculum.

Wiggins and McTighe (2000) also state that given the primary focus is on understanding, curricular units should be anchored by performance tasks, providing evidence that students are able to use their knowledge in context; a more appropriate means of assessing understanding.

Summary

What are the benefits and challenges of integrating Interprofessional education (IPE) into vascular sonography coursework? This chapter discusses a plan to construct curriculum integrating IPE into my vascular sonography coursework, creating the curriculum in three different phases of students' education. The goal of the new curriculum is to support students in learning collaborative skills with specific emphasis on applying these skills to healthcare. It also includes developing skills to build trusting and respectful relationships with those that they will work with in a clinical setting.

The lesson plans are created based on collaborative teamwork, specifically focusing on case-based scenarios with students in other health science disciplines, and further applying these skills in the clinical fieldwork at the end of their training. Curriculum created will be used in the university classroom and partially in the clinical

setting. Participants are sonography students in phase one of the curriculum, and introduce students from other health science programs in phase two and phase three.

In the following Chapter Four, I will contemplate on how IPE has been implemented in the past, and how the new integrated approach to teaching team-based care in a vascular sonography class will provide and strengthen the necessary skills needed to sustain IPE. I will reflect upon the overall process and what has been learned, including limitations, unexpected successes, and what may be improved.

CHAPTER FOUR

Conclusions

Overview

What are the benefits and challenges of integrating Interprofessional education into vascular sonography coursework? This question is what motivated the research and creation of a curriculum project that uses an Understanding by Design curriculum map along with a variety of lesson plans and case studies to teach intercollaborative practice. Chapter Four revisits the literature researched and how it supports the development of my project and its design. It makes deliberate connections to collaboration, intercollaborative practice and the Triple Aim Initiative, and challenges in effectively developing intercollaborative curriculum.

Chapter Four discusses the project impact on the academic community in health science programs and how this new curriculum contributes to public scholarship in the health science community and the clinical setting.

This chapter also examines the project limitations including faculty cooperation and the barriers to implementation of this curriculum in a clinical arena. It also provides a look ahead to a discussion of how to possibly create and implement a Phase Three into the clinical internship in addition to the curriculum developed for the classroom.

Finally, Chapter Four offers implications for this curricular project along with final reflections in completing my capstone journey.

Revisiting the Literature Review

Collaboration

Impactful connections were made in creating my curricular project to the literature that I researched. Chapter Two provides an in-depth look at authors' Ashman and Gillies (2013) two studies they wrote about in the 1920s and 1930s. Author Mead (as cited by Ashman & Gillies, 2013) observed that individuals worked cooperatively in groups when mutual outcomes were pursued. I have thoughtfully correlated this research with my new curriculum design. In my UbD curriculum maps, I modeled working in groups among students only in the Sonography course to solve patient case studies in Unit One. The goal is to work specifically on developing communication skills necessary to problem-solve. I then introduce students from other Radiology health care disciplines in Units Two and Three to further develop communication skills while initiating trust and teamwork among these different modalities. All are working toward the same goal; successful patient outcomes.

Authors Thistlethwaite et al. (2012) provide an excellent analogy, associating healthcare to a child's development where play begins in parallel, progressing to social play that ultimately grows into cooperative play. I have been mindful in creating my curriculum design to mirror this comparison; initially concentrating on communication skill development in a uniprofessional setting to development of teamwork and collaborative skills in a more Interprofessional environment in Units Two and Three with other Radiology modalities. Building trust among one another in Unit One will prepare them for developing the same skills, trust, and cooperation with others that are outside of their group.

Intercollaborative Practice and the Triple Aim

Teaching to impact and improve the Triple Aim has held particularly special interest to me. The Institute for Healthcare Improvement (IHI) developed this plan in 2007 to achieve three goals; effectively deliver safe treatment to patients by teams in healthcare, improve total cost of care, and improve the experience of the healthcare provider, thereby improving the patient experience (Berwick, 2008). The underlying concepts of this initiative is woven throughout my new curricular design. As stated in Chapter Two, researchers Oandasan & Reeves (2005) define intercollaborative practice as an exercise that promotes active participation of each discipline in patient care. The goal of this project is to offer students meaningful learning experiences to effectively teach them how to work as a team. By using case studies in the classroom as a tool to develop these skills, it can improve patient care in the clinical field.

Challenges in Effectively Developing Intercollaborive Curriculum

Embedding Interprofessional curriculum into the classroom is challenging. I have used McNair's (2005) research to guide me in creating thoughtful curriculum that can address behaviors and values surrounding teaching communication and teamwork strategies. McNair (2005) asserts that barriers exist, challenging the delivery of Interprofessional curriculum; the assumption and expectation that appropriate values are already developed without direction, a lack of structure to ensure competency in collaborative work, and that all healthcare disciplines are not on the same page when agreeing to a contract of including Interprofessional values and behaviors.

Teaching and facilitating communication exercises, specifically in the case studies I have developed, provides the appropriate direction for Sonography students to utilize

and hone their intercollaborative skills once the other Radiology students are introduced. A smaller setting to introduce my curriculum will aid in evaluating Interprofessional competency. A debriefing session at the end of each case study exercise with all students in this smaller venue will also help gauge successes. The third challenge McNair (2005) poses is critical in trying to develop this curriculum. Key faculty involved in the lesson plans will effectively communicate to ensure all are on the same page when discussing and developing the appropriate Interprofessional values and behaviors. The most important component is that it begin on a small scale and eventually develop to encompass a larger setting. Once students have developed these teamwork skills, a larger setting may be introduced. It may involve communication with those in the clinical field that teach my students during their internships.

Project Impact

Contribution to Scholarship

According to the National Center for Interprofessional Practice and Education (The “New” IPE, 2017), Interprofessional education is about “improving health, creating support systems and trying different models of practice to achieve good healthcare outcomes once out in the clinical field” (p. 2). The newly designed components of the course is a departure from the larger collaborative setting. Typically Interprofessional education has been taught with multiple disciplines in a large setting over a weekend or all-day program. My new design teaches students to collaborate in a smaller venue, focusing on developing the core components of IPE in an effort to generate trust, respect and shared accountability to effectively work as a team to optimize patient care. Embedding IPE curriculum into the classroom intentionally prepares and supports those

in the academic and clinical health community, including health professionals, health care workers, students, residents, patients, families and communities.

Project Limitations

Faculty Cooperation

I am not entirely convinced that most faculty share my same enthusiasm for Interprofessional education. While I believe that there may be a general consensus that positive outcomes surface from learning how to work collaboratively, administrative support, time constraints, and coordination of classroom schedules to have students in multiple health disciplines convene are all worthy of consideration when implementing my curriculum.

In speaking with my colleagues in the Sonography program, they are committed to improving the way we may teach intercollaborative practice. I have also spoken with faculty in the Radiography program. They are also supportive of cooperatively developing ways for our students to learn together. Perhaps this is where I begin. I believe that starting small with a specific focus of teaching team-based care through development of good communication and intercollaborative skills to my students is how to be successful. I believe that working with faculty in other imaging disciplines to branch out and include them in the curriculum is achievable.

Clinical Internship

When I first began this project, my thoughts were to include curriculum designed to embed Interprofessional education into the clinical internships that all health students are required to participate in. I have introduced Phase One and Phase Two of the curriculum design, both being implemented in my vascular Sonography course. The

missing component is applying the intercollaborative skills learned in the classroom into the patient care setting. I did not feel this could be accomplished in the classroom, but may be developed in the future during clinical internships.

A Look Ahead

Development and Implement Phase Three

As was stated previously, my project provides curriculum to teach intercollaborative practice in my vascular Sonography course. I have created coursework to embed Interprofessional practice into my vascular curriculum that includes student participation from other imaging disciplines within the Radiologic sciences. Phases One and Two will be implemented in my course beginning the fall semester, 2018. How may I continue this work to include students implementing the intercollaborative skills into the clinical setting?

Developing a Phase Three to this curriculum to include expanding team-based education during clinical internships may be the next step. Phase Three would incorporate students from other healthcare disciplines to join students in Sonography and Radiology during their internships to discuss case studies, working together to use their expertise in problem-solving directly in the patient care setting. Each healthcare discipline brings their own set of expertise to aid in successful patient outcomes. A convergence of this expertise is valuable when teaching this team-based approach, and can be constructive when integrating it in the clinical experience.

Implications of the Project

Reflections

The journey to completing this capstone project has been an illuminating experience. It has reinforced why I am passionate about this work. The process has strengthened my conviction that intercollaborative practice is worthy of integrating into the health science classroom. As a health practitioner I have seen first hand how a lack of communication, lack of respect for other health professions, and a deficiency of trust in the value of various disciplines can be counterproductive in successful patient outcomes in the clinical arena. My unique perspective in concurrently working in patient care and academia has helped me create a new approach to addressing how I may teach Interprofessional education and intercollaborative practice.

Currently Interprofessional education (IPE) is implemented across multiple health science disciplines within my university, gathering over 100 students to collaborate in one room for a day or a weekend. Students are divided into multiple groups, all holding a diverse mix of specialties. They are given various patient care scenarios to problem solve using their resources and expertise they have acquired through their specific programs.

In speaking with many faculty and students, and participating in these events myself, I have found that this method of IPE has little impact on how students feel about working intercollaboratively. Faculty are not motivated to participate and students see very little value in these events. Experiencing these IPE events has led me to the conclusion that you can assemble a group of students and faculty together in a large room, and ask them to work as a team, but unless they are educated to value the expertise of other disciplines, trust that others may have more knowledge about a specific clinical

field, respect that the contribution of many areas in health care can lead to more successful patient outcomes, these large IPE events are futile.

In my research throughout this process, searching for effective delivery methods of IPE has left me dissatisfied with the current approaches. Much has been written and researched about IPE. My passion has not waivered about how important it is to teach students how to collaborate, trust, communicate and share accountability. However, I am disillusioned, as my research has shown the limitations of IPE implementation in many universities globally.

Summary

Chapter Four provided conclusions to answering my research question *What are the benefits and challenges of integrating Interprofessional education into vascular sonography coursework?* It revisited the literature review, making connections to my new curriculum design. This Chapter discusses the impact that the capstone project will have on the health science community, beginning with the academic arena and branching into the clinical setting, providing an explanation of how the curriculum contributes to public scholarship.

Chapter Four also assesses the limitations of the project, particularly relating to faculty cooperation and implementation of the curriculum in the clinical setting. Finally, Chapter Fours offers a look ahead at how a Phase Three may be implemented into the curriculum for students entering the clinical internship, while providing implications of the capstone project along with final reflections.

Final Thoughts

Through this capstone journey I have learned that there is a need for a paradigm shift. By modifying the way students think about and interact with one another, the culture of the environment and attitudes of the classroom will change, improving the experience of the students, and thereby benefiting the health science community as a whole. This cultural shift will then transmit into the clinical field these students enter. They face challenges as they enter the healthcare arena; challenges with those that do not care to collaborate, those that work in their various disciplined silos, and perceived power differentials within departments. It must begin in the classroom. My new curriculum design is a beginning to this paradigm shift. Teaching teamwork in my course establishes a foundation of communication, trust, and value. I fervently believe that changing the culture in the classroom will successfully translate to culture change in the clinical world.

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