ATTITUDES, KNOWLEDGE, AND PERCEPTION: THE DECISION OF A RADIOGRAPHY PROGRAM DIRECTOR TO IMPLEMENT THE USE OF INTERPROFESSIONAL EDUCATION IN CURRICULUM THROUGH THE LENS OF ETHICAL LEADERSHIP

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ABSTRACT

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The expectation of healthcare professionals is to provide quality, patient-centered care to all patients. Miscommunication between the healthcare team resulted in segmented care and medical errors. As disconnects were discovered, healthcare professionals began promoting a team-based approach to care. The team-based approach helped eliminate barriers that inhibited effective communication and quality care to patients, providing a more cohesive patient care experience. Implementing team-based, patient-centered care in professional practice requires training to be introduced at the educational level of healthcare programs. A teaching strategy called interprofessional education (IPE) was developed to help teach students from different healthcare professions to learn with, from, and about each other's professions.

Over time, healthcare education program accreditors were able to integrate IPE recommendations into their learning standards. However, not all healthcare professions chose to include IPE in their educational accreditation standards which left the decision to use IPE in some healthcare programs up to the program director. One healthcare profession in particular, radiography, has not yet mandated IPE into its educational accreditation standards.

This study explored if radiography program directors' self-reported attitudes, knowledge, and perceptions of IPE were associated with their self-reported level of use of IPE in their programs. The author created a survey to collect data from radiography program directors accredited by JRCERT ($N = 262$). Analysis of the data revealed a positive association between program directors' attitudes, knowledge, and perceptions of IPE and their decision to use IPE in their radiography programs. Investigating the relationship between program directors' attitudes,

knowledge, and perceptions of IPE and their level of use of IPE contributed to an understanding of how educational leaders' make decisions that impact their programs and subsequent profession. Data analyses were examined through a lens of ethical leadership. The ethic of profession served as the theoretical lens to examine data analyses through a lens of ethical leadership.

This study emphasizes that personal considerations of a decision maker should not be overlooked in the decision-making process. The DRE process incorporates practical and ethical considerations into a stepwise process and encourages leaders to make the best decision possible when the choice is optional.

Keywords: Interprofessional education (IPE), patient-centered care, program directors, radiography, ethical leadership, decision-making, programmatic accreditation, ethic of profession, team-based care

I dedicate the years of work on this research to my family. To my beautiful and devoted mother, your example of a life of service has always fueled my passion to serve others. Until we meet again. To my big sisters, your friendship and support have always been a constant in my life and mean so much to me. To my children and grandchildren, I encourage you to reach beyond your comfort zone. You will never know what you can achieve unless you try. I love you all beyond measure. Finally, to my husband, my Rock, you have loved and supported me throughout my entire career. You mean the world to me.

This body of research is dedicated to the medical imaging educators who are committed to improving student learning experiences and developing qualified imaging professionals. This study is dedicated to students of healthcare education programs who work diligently in and out of the classroom to better understand their field of study to provide patient-centered care to those in their community. My dissertation is the culmination of my 35 years imaging career which I dedicate to my patients of the past, present, and future; you have always been my focus.

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CHAPTER I. INTRODUCTION

The expectation of healthcare professionals is to provide quality, patient-centered care to all patients. Patient-centered care concentrates on the patient as a whole and provides care based on the patient's individual preferences, values, and needs (Emami & Safipour, 2013; Greene et al., 2012). A critical element to providing quality, patient-centered care is using a team-based approach (Wagner et al., 2017). Team-based care, also known as interprofessional care (IPC), requires healthcare workers from a variety of professions to come together to work cohesively and collaboratively to care for the patient (Lawrence et al., 2015; Zawora et al., 2015).

Historically, healthcare professionals worked separately in their defined disciplines during the process of providing care and the patient assumed a passive role in the care they received. The traditional patient care process involved the patient being passed from one healthcare professional to the next with limited communication among the professionals about the care being provided, and limited input from the patient about the care they recevied (Longtin et al., 2010). This created problems for the patient, such as miscommunication between caregivers about the care of the patient, which resulted in segmented care and medical errors (Boardman, 2017).

As the disconnect during the traditional patient care process was discovered, healthcare professionals began to promote a team-based approach in the care of patients. The team-based approach helped eliminate the barriers during the patient care process that inhibited effective communication and quality care (Homeyer et al., 2018; Lochner et al., 2018). Individualized, quality, patient-centered care requires team-based delivery which involves professionals from all healthcare disciplines to learn and work as a team and for the patient to take an active role in making decisions about their care (Longtin et al., 2010; Schottenfeld et al., 2016).

Implementing the concept of team-based, patient-centered care in professional practice to provide a more cohesive patient care process requires training to be introduced at the educational level of healthcare programs. In 2010, a call to action was made by the World Health Organization (WHO) for educators and policy makers to incorporate interprofessional education (IPE) experiences into healthcare teaching standards. The WHO (2010) defined IPE as two or more healthcare professions learning about, with, and from each other. Prior to the WHO's call to action, IPE was not mandated in healthcare education program standards, not well established, and not heavily acknowledged as a critical component of healthcare education.

The Interprofessional Education Collaborative (IPEC) is a coalition that represents six national education associations of schools for health professions: allopathic medicine, osteopathic medicine, nursing, pharmacy, dentistry, and public health. IPEC collaborated to develop learning domains to guide the integration of IPE into healthcare education program curricula. The learning domains focused on key objectives called core competencies to accomplish the goal of promoting the skills needed to provide quality, patient-centered care across all healthcare education.

The newly created core competencies concentrated students' learning on values and ethics, roles and responsibilities, teams and teamwork, and interprofessional communication, and provided a foundation for healthcare education program accreditors to integrate IPE into their learning standards. Prior to the newly established core competencies that structure IPE experiences, healthcare education programs did not have the resources to incorporate IPE into their curricula. By utilizing the foundational domains created by IPEC, healthcare education program accreditors were able to integrate IPE recommendations into their educational learning

standards (IPEC, 2016). However, not all healthcare professions chose to standardize IPE into their educational accreditation standards.

IPE Integration

One healthcare profession in particular, radiography, has not yet mandated IPE into its educational accreditation standards. Radiography is a branch of allied health, a healthcare profession group, that focuses on creating diagnostic images of patients using x-radiation. Allied health professions are considered healthcare professions that are non-nursing/midwifery and non-medicine professions. Allied health professions make up as much as 60% of the healthcare workforce in the U.S. and provide services that involve identification, evaluation, and prevention of diseases and disorders; dietary and nutrition services; and rehabilitation and health systems management (ASAHP, 2020; Matus et al., 2018). Allied health professions include, but are not limited to, dental personnel, medical imaging specialists (radiologic and nuclear medicine technologist and sonographers), dietitians, medical laboratory personnel, occupational and physical therapists, respiratory therapy, speech and language pathologists, and physican assistants (ASAHP, 2020).

Although critical to the healthcare team (IOM, 2003), radiography has been less consistently involved in IPE than other healthcare programs (Karnish et al., 2019). Just as IPE is important to other healthcare education programs to teach students to be a member of the care team, it is equally important that students from radiography programs learn to be a member of the care team.

The Joint Review Committee for the Education of Radiologic Technology (JRCERT), the programmatic accreditor for radiography programs, sets the standards for radiography programs to meet. The standards represent the minimum expectations of radiography programs to ensure

the graduates of JRCERT accredited programs posess the skills necessary to enter the profession. JRCERT has included interprofessional development into their 2021 Standards. Standard 4.2 lists interprofessional development as one of the optional "innovative approaches to curriculum delivery methods" within the standard, but IPE has not yet been mandated of radiography programs (JRCERT, 2021, p. 28). Moreover, there is limited involvement in IPE by radiography programs in comparison to other healthcare education programs (Karnish et al., 2019). Research conducted on IPE in healthcare education shows that radiography was involved in IPE often as an elective program to meet the requirements for another program, such as medicine or nursing (Hamada et al., 2019). This dissertation study will contribute to the understanding of how many JRCERT accredited programs are involved in IPE experiences and what contributes to the limited involvement reflected in the current research. Determining involvement in IPE experiences is necessary because there is a need for radiography educational programs to keep pace with the other healthcare professions to maintain consistency amongst each member of the patient care team.

From a study conducted on faculty perceptions of IPE in other healthcare professions programs, it was suggested that the incorporation of IPE and overcoming the challenges associated with IPE were influenced heavily by how the programs' faculty perceived IPE (Hinderer et al., 2016). There is a need to know whether radiography program directors' perceptions about IPE are impacting the integration of IPE into radiogarphy education programs.

Purpose of the Study

The purpose of this study was to better understand the use of IPE in radiography programs and the role program directors' attitudes, knowledge, and perceptions of IPE have in implementing IPE in radiography education programs. Determining the level of use of IPE

helped establish a baseline of program directors who are currently implementing IPE and, if so, whether student participation in IPE was required or optional. Evaluating program directors' attitudes, knowledge, and perceptions of IPE was aimed at determining whether there was a relationship between program directors' attitudes, knowledge, and perceptions of IPE and their level of use of IPE in their programs. Determining if there was a relationship between program directors' attitudes, knowledge, and perceptions of IPE and their level of use of IPE contributed to an understanding of why program directors of JRCERT-accredited radiography programs choose to use or not to use IPE in their programs. Finally, viewing program leaders' choices through a lens of ethical leadership will provide insight as to what considerations are taken when program directors are making decisions that may impact the profession.

Background of the Study

Historical Background of Team-Based, Patient-Centered Care

In 1972, a final report titled "Educating for The Health Team" was generated from an Institute of Medicine (IOM) conference on the interrelationships of educational programs for health professionals. The IOM steering committee concluded that the delivery of quality patient care requires a team approach. The steering committee also highlighted a need for educational institutions to make an effort to bring students from various healthcare disciplines together to learn about each other's contributions to the team, assimilate the roles of different professions in order to function as a team, utilize learning opportunities where an interdisciplinary approach already exists, and allow students to recognize the importance of their roles and how they can complement each other (IOM, 1972).

The IOM report also highlighted the concern of professional silos. Boardman (2017) defines professional silos as "limited knowledge of the importance of collaborative practice and

understanding of other healthcare provider's professional role(s)" (p. 157). Professional silos promote barriers and miscommunication among healthcare professionals which can lead to segmented care and medical errors. Although different healthcare professions' educational programs were recommended to keep their curricula separate, the report emphasized the importance of collaboration in some capacity among students from these educational programs prior to reaching the workforce and for faculty from different healthcare disciplines to facilitate the experience to lead by example (IOM, 1972).

Efforts toward the education of the interdisciplinary team process continued over the next three decades with healthcare professionals and educators contributing to the research of interdisciplinary learning and federal intitatives, helping to drive the related research (Abramson, 1984; Harris, 1978; Mazur et al., 1979; Wessell, 1981). From 1999-2003, patient safety and quality care were the primary focuses of the IOM. The concern over segmented care and lack of communication were highlighted as two contributors to medical error, prompting a need for immediate improvement in the quality of the health care provided to patients by improving the standards of care with routine monitoring and reporting quality care outcomes (IOM, 1999). There was also a call for the need for health professionals from different fields to work and learn as an interdisciplinary team as it is important they communicate and collaborate effectively to provide safe, quality care to their patients.

As more evaluations on these issues occurred, the IOM documented concerns of learning in disciplinary silos and of a lack of research on the impact of interdisciplinary education, both of which serve as barriers to developing healthcare teams (IOM, 2003). The IOM recommended five core competencies to be measured in 21st century healthcare systems, including providing

patient-centered care, working in interdisciplinary teams, employing evidence-based practices, applying quality improvements, and utilizing informatics (IOM, 2003).

Though the evidence suggesting the positive influence of collaborative practice and IPE was mounting across the world (Olson & Bialocerkowski, 2014; Reeves et al., 2010; Uman, 2011), themes such as a lack of support by administrations, time restraints and challenges with the coordination of curricula across disciplines, and a lack of perceived value and understanding of how to teach and assess IPE learning experiences became barriers to implementing IPE by program faculty. Without the guidence of accreditation standards and resources to support IPE, it was difficult for institutions to implement and sustain the programs (Curran et al., 2007).

WHO Call to Action

In 2010, the focus shifted from the need for patient safety and quality, patient-centered care to how healthcare professions educational programs were going to teach the skills needed for promoting patient safety and quality, patient-centered care to students entering the workforce. New graduates of healthcare education programs were expected to be able to function as a member of the patient care team and provide their patients with safe, quality, patient-centered care. The WHO initiated a call to action to healthcare education leaders and policy makers in support of interprofessional education to be taught at the foundational levels of healthcare education. This call to action included a framework to broadly educate and implement IPE in healthcare education (WHO, 2010). From this call to action, various associations and accreditation groups in the United States acknowledged the WHO's recommendations.

Beginning in 2011, various healthcare profession associations, who govern educational program standards for their respective professions, began to adopt and support the use of IPE; however, not all healthcare profession associations chose to do so. The field of radiography was

not one of the healthcare profession associations and accreditation groups that adopted the mandated use of IPE. For those professions that did adopt and support the use of IPE, their corresponding accreditation groups eventually joined them in supporting IPE and incorporated the use of IPE into their respective healthcare program accreditation standards. Currently, there is a group of 25 accrediting bodies for healthcare education called the Health Professions Accreditors Collaborative (HPAC). Members of HPAC have a mutual interest in guaranteeing "accreditors' standards, policies and procedures support and prepare graduates for contemporary practice as part of interprofessional teams" (HPAC, 2019). HPAC (2019) provides an IPE guidance document which supports the shared perspective that "members recognize that accreditation must play an important role promoting quality IPE that leads to effective health outcomes, including encouraging communication and collaboration across professions and the institutions that sponsor education programs" (p. 7).

The IPEC answered the call to action for IPE and contributed to the momentum of the IPE movement. IPEC represents 21 national health professions associations whose mission is to "ensure that new and current health professionals are proficient in the competencies essential for patient-centered, community and population oriented, interprofessional, collaborative practice" (IPEC, 2016, p. 18). IPEC (2016) promoted IPE by developing a standardized format for IPE which included four core competency domains that provided a clear structure of the implementation of IPE within a curriculum. The IPEC competency domains include values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork. These domains are currently being used throughout various healthcare profession education programs and are endorsed by HPAC (HPAC, 2019).

IPEC Domain 1 - Values and Ethics

The first domain discussed by IPEC is values and ethics. All professions follow their own code of ethics and scope of practice, so there is a need for healthcare professionals to better understand each other's perspectives. Through this domain, IPE experiences could include a way to facilitate conversation about values and ethics and provide an avenue of communication between students of different healthcare professions.

The values and ethics domain targets working with others to build a relationship between professionals that fosters mutual respect and shared values (IPEC, 2016). Under this domain, there are ten sub-competencies that program directors can select and incorporate into their program curricula. These sub-competencies cover topics such as ethical conduct, relationships with patients and families, privacy, ethical dilemmas, honesty and integrity, scope of practice, and diversity (IPEC, 2016).

IPEC Domain 2 - Roles and Responsibilities

The second domain discussed by IPEC is roles and responsibilities. Each healthcare professional plays a part in providing quality, patient-centered care. There is a need for each role to complement other roles and to also be aware of what responsibilities each healthcare team member's role entails when providing patient-centered care. Through this domain, IPE experiences could provide a way for students to observe and better understand the knowledge and skills each specialty brings to the patient and how various disciplines complement each other.

The roles and responsibilities domain targets each student's understanding of their own role in patient-centered care as well as the roles of the other healthcare professionals from different disciplines they will be working with (IPEC, 2016). Under this domain, there are ten

sub-competencies that program directors can select and incorporate into their program curricula. These sub-competencies cover topics such as clear communication of all roles to patients, families, communities, and other professionals, understanding the limitations of one's own role, engaging with diverse professionals, recognizing roles and how they promote health and prevent disease, clarifying responsibilities, continuing collaboration, and providing care that is "safe, timely, efficient, effective, and equitable" (IPEC, 2016, p. 12).

IPEC Domain 3 - Interprofessional Communication

The third domain discussed by IPEC is interprofessional communication. Communication is key to team relationships and patient safety (IPEC, 2016). In fact, failure to communicate has been found as a main contributor to medical errors during healthcare surveys (TJC, 2015). As such, it is important to promote this skill as part of IPE experiences in order to enhance the quality of patient-centered care students will provide upon entering the workforce.

The interprofessional communication domain targets working with others to communicate effectively with other healthcare professionals as well as patients, families, and communities (IPEC, 2016). Under this domain, there are eight sub-competencies that program directors can select and incorporate into their program curricula. These sub-competencies cover topics such as appropriately communicating information, using common terminology, practicing active listening, and being respectful in difficult situations (IPEC, 2016).

IPEC Domain 4 - Teams and Teamwork

The fourth domain discussed by IPEC is teams and teamwork. As healthcare has shifted to team-based, patient-centered care, working as an effective team is critical to improving patient outcomes (Zawora et al., 2015). With multiple healthcare professionals collaborating to provide quality care to the patient, teamwork is a must (Wagner et al., 2017). Through this domain, IPE

experiences can provide practical experiences for students to interact professionally with students from other healthcare professions.

The teams and teamwork domain targets developing team structure (IPEC, 2016). Under this domain, there are 11 sub-competencies that program directors can select and incorporate into their program curricula. These sub-competencies cover topics such as shared accountability, performing effectively as a team, improving healthcare processes, and implementing leadership strategies (IPEC, 2016).

Benefits of IPE

With the support of the IOM, the WHO, and various healthcare associations, IPE is considered a critical tool for providing quality, patient-centered care. With the use of IPE comes multiple benefits. IPE provides an environment to enhance students' skills before entering the workforce, which ultimately provides the necessary education to decrease medical error through addressing communication issues and promoting team building (TJC, 2015; Wagner et al., 2017).

In efforts to decrease medical error through better communication strategies, IPE was evaluated as a tool for improving the communication barrier between healthcare professions. Liew et al. (2014) reported that communication skills improved between undergraduate medical students and nursing students after participating in an IPE experience. Students from both programs (N = 127) participated in an IPE experience using a simulated patient (SP) whose health was deteriorating quickly. SPs can be volunteers, students, or computerized mannequins simulating real-world scenarios in a learning environment which allows students to practice skills needed for clinical practice on real patients (Gibson & Davidson, 2015; MacLean et al., 2018; McFetrich, 2006). All students who participated in the IPE experience used standardized communication tools to report the patient's condition to each other. Using a common framework

to communicate information about the patient's condition allowed both medical and nursing students to report to each other cohesively and empowered them to speak up in an effective and timely manner.

The communication simulation conducted in Liew et al.'s (2014) study also called attention to the importance of communication between team members when making decisions about the care of a patient. Using standardized communication tools during the IPE simulation helped the students develop important decision-making skills and reporting patient information skills needed to promote the students' confidence in communicating with each other about their patient's care (Liew et al., 2014). Through the opportunity to work with one another in a simulated IPE experience, the medical and nursing students in the study were able to practice communicating and working as a team to help improve the communication skills needed for caring for their patients.

Similarly, Scotten et al. (2015) saw a direct impact of IPE on patients when their study indicated improved interprofessional communication between healthcare team members through a series of IPE experiences. The IPE experiences also improved students' communication with their patients and patients' families when they used standardized communication tools and skills during care and after discharging the patient from their care unit. The study took place over a 12-month period in an acute care pediatric unit where healthcare members from multiple disciplines cared for children with a variety of health care needs.

The intention of Scotten et al.'s (2015) IPE experience study was to train the healthcare team, which included nursing school faculty, nursing staff, physicians, occupational therapists, physical therapists, speech therapists, dietitians, and pharmacy, through a series of team communication trainings to help them recognize patients who were at risk of developing

complications after being discharged from the pediatric unit. Each member of the care team used standardized communication tools to communicate with the patient and their family while they received care in the pediatric unit. This was intended to allow the healthcare team to use the same learned skills to follow up with the patient and family after the child had been discharged from the unit.

The healthcare team developed an interprofessional transitional care model which included telehealth visits to assess how the child's health was progressing once they were discharged and at home. The healthcare team reported increased satisfaction in the quality of care received by the patient and family after being discharged. A contributing factor to the patient and their family's satisfaction included access to the healthcare team to answer questions without requiring them to travel to an in-person appointment. The healthcare team was able to assess the patient using video technology and make continued care decisions based on their assessment (Scotten et al., 2015). As demonstrated, IPE provides an outlet to improve communication between healthcare team members and to improve the quality of care the team provides their patients.

IPE is also a route to promote team building amongst healthcare professions. In the aspect of team building, respecting and understanding the other team members is critical (IPEC, 2016). In a meta-analysis, Wang et al. (2019) found that IPE promoted an improved understanding of other roles and their values, as well as an improved respect for other roles, in healthcare education students. IPE was identified as a key player in team building for healthcare education students (Wang et al., 2019). Moreover, another study concluded that IPE had a positive impact on improving the knowledge, skills, and attitudes of healthcare education students after their IPE experience (Guraya & Barr, 2017). IPE has a clear role in helping

healthcare education students build the skills necessary for working collaboratively as a healthcare team and preparing them for the workforce.

Challenges of IPE

When implementing a new process, there can be challenges to overcome. In implementing IPE into healthcare education programs, some of the major challenges noted were alignment of curricula, a lack of leadership dedicated to the coordination of IPE programming, and a lack of resources, including funding, to support the integration of the new program (Clark, 2018; Sunguya et al., 2014; Teodorczuk et al., 2016; Wong et al., 2019).

The required curriculum to become certified professionals for healthcare education programs can be robust and involves maximizing course content by program directors. However, the current discipline-specific curricula are often full and seldom leave room for extra content. Program directors may not choose to prioritize IPE as part of their curriculum if programmatic accreditors do not require its inclusion or if the learning institution is not committed to supporting IPE (Wong et al., 2019). Thus, it is not common to find programs adding content without a push from an internal or external force.

Additionally, each healthcare education program is focused on their own discipline-based curriculum. Thus, it is difficult to integrate additional interprofessional objectives and navigate the logistics of scheduling IPE experiences conducive to fit all programs' needs. If the learning institution provided a dedicated faculty position to coordinate and support IPE amongst participating healthcare education programs, program directors may be more willing to include IPE experiences into their curriculum if someone else was responsible for the coordination of the experiences. However, if a dedicated IPE position such as a coordinator is not present, coordinating IPE experiences between various healthcare education programs can prove difficult

and time consuming, limiting the ability to have IPE programming at learning institutions (Sunguya et al., 2014; Teodorczuk et al., 2016; Wong et al., 2019).

A lack of resources, including funding, poses another challenge in implementing IPE. Funding IPE experiences across multiple program budgets could present a challenge if there is not institutional support for the experiences (Li, 2007; Wong et al., 2019).

Research Questions

The study was guided by the following questions:

RQ1 What is the level of use of IPE in radiography programs?

RQ2a Are program directors' self-reported attitudes toward IPE associated with the level of use of IPE?

RQ2b Is program directors' self-reported knowledge of IPE associated with the level of use of IPE?

RQ2c Are program directors' self-reported perceptions of IPE associated with the level of use of IPE?

Nature of the Study

For the current study, a survey design was used to study a cross-sectional sample of directors of JRCERT-accredited radiography programs. This non-experimental, quantitative design was chosen to examine program directors' attitudes, knowledge, and perceptions of IPE and if attitudes, knowledge, and perceptions of IPE were associated with the directors' level of use of IPE in their programs. The collected data were then analyzed to determine if there was an association between the program directors' attitudes, knowledge, and perceptions of IPE and the level of use (Creswell, 2015).

This quantitative study examined the responses of program directors of JRCERT-accredited radiography programs who elected to participate in the study. Directors of JRCERT-accredited programs were chosen because all JRCERT-accredited programs are required to meet a set of minimum standards clearly defined by the accreditors, ensuring the programs investigated in the study were comparable. The current JRCERT minimum standards do not include IPE participation. Utilizing the required minimum standards as a baseline allowed the researcher to identify and analyze which directors from the study have added IPE to their program. The sample for the study was drawn from the current population of directors of JRCERT-accredited radiography programs, which is approximately 605.

Data for this study were collected utilizing the Use of Interprofessional Education (IPE) in Radiography Education survey (see Appendix A). The survey tool used for the study built on a pre-existing survey tool called the Interprofessional Perception, Knowledge, and Attitudes Scale (IPKAS).

Hinderer et al. (2016) developed the IPKAS survey to evaluate healthcare faculty's perceptions, knowledge, and attitudes toward IPE. The IPKAS survey consists of 23 statements scored on a 4-point Likert scale ranging from 0 = strongly disagree, 1 = disagree, 2 = agree, and 3 = strongly agree with a total possible score ranging from 0-69 points. The 23 statements are divided into three subscales: perception, knowledge, and attitudes.

Post-data collection for the Hinderer et al. (2016) study reported a return of 71 of 116 surveys which yielded a 61.2% response rate. Internal consistency of the total survey was evaluated with a Cronbach's alpha of 0.82, which is reliable, but the authors did not report a Cronbach's alpha for each of the three subscales (Hinderer et al., 2016).

Hinderer et al. (2016) granted the researcher permission to modify and use the IPKAS statements for the current study (see Appendix B). Minimal modifications were also made to four of the 23 statements from the IPKAS survey for the current study. The three subscales, number of questions, and possible subscale scores on the Use of Interprofessional Education (IPE) in Radiography Education survey remained consistent with the IPKAS survey.

For the current study, a Delphi panel review was conducted for content validation for the Use of Interprofessional Education (IPE) in Radiography Education survey. The expert panel selected to review the survey consisted of seven healthcare education leaders representing various professions from a private college in the Midwest region of the United States. The Delphi panel members had all previously researched, planned, and executed interprofessional events and experiences for students from various healthcare education programs.

A Delphi panel review is a multi-session review process that continues until the expert panel deems the tool valid for use (Colton & Hatcher, 2004). The researcher provided the Delphi panel with the Use of Interprofessional Education (IPE) in Radiography Education survey via a Qualtrics link and paper form, detailed instructions explaining the purpose of the survey, and explanations of how their feedback would help validate the survey. Based on the instructions, the panel members completed the survey as if they were part of the study via the Qualtrics link and then wrote on the paper copy of the survey to provide feedback. The Qualtrics software documented how long it took for panel members to complete the survey. The average time was (M = 7.71) minutes.

The Use of Interprofessional Education (IPE) in Radiography Education survey used for this study consisted of a total of 37 items, including one qualification question, six demographic questions, five focused questions addressing the study's dependent and independent variables,

one question addressing directors' level of use of IPE, 23 statements from the modified IPKAS survey, and one open-ended question (see Appendix A).

The survey began with a qualification question to ensure the participants of the current study met the target sample population of current directors of JRCERT-accredited radiography programs. Questions 2, 3, and 4 addressed program demographic characteristics, including the type of institution sponsoring the program, the terminal award granted for the program, and the U.S. region where the program is located, respectively. Questions 5, 6, and 7 addressed respondent demographic characteristics, including years of experience as a director of a radiography program accredited by JRCERT, the year they became certified with the American Registry of Radiologic Technologists (ARRT), and their age in years, respectively.

Questions 8 through 11 served as focused questions to address the research questions of the study. Question 8 was a dichotomous question regarding whether the radiography programs offered opportunities for IPE. Questions 9 through 11 included Likert-type questions concerning program directors' general attitudes, knowledge, and perceptions of IPE. Question 12 related to ethical leadership and decision making regarding IPE use. Question 13 concentrated on the program directors' self-reported level of use of IPE in their programs which addressed RQ1. Questions 14 through 36 of the survey were the modified statements from Hinderer et al.'s (2016) IPKAS survey which were divided into three subscales to address program directors' self-reported attitudes, knowledge, and perceptions of IPE.

The survey concluded with an open-ended question relating to general feedback from radiography program directors on their perceptions of challenges to implementing IPE; however, this study does not include qualitative data collected from the open-ended question.

Theoretical Framework

The theoretical framework used for the current study focused on perspectives related to ethical leadership. The examination of ethical leadership included concepts of decision making, the ethic of profession, utilitarianism and the principle of benefit maximization (Shapiro & Stefkovich, 2005; Starratt, 1991; Strike et al., 2005).

Leadership involves making decisions that enact change or support maintaining the status quo and continue with current processes or practices (Vogel, 2012). According to Mathur and Corley (2014), ethical leadership involves making decisions based on moral principles, values, and beliefs. However, ethical leaders may base decisions on their own moral principles, values, and beliefs and not consider how their decisions affect others. Mathur and Corley suggested that educators play an important role in students' educational journey toward their end goal. Therefore, when decisions are being made about what students need to succeed on their educational journey, educational leaders should consider the students and others affected when making those decisions.

The ethic of profession concentrates on the ethical paradigm which examines leaders' fidelity to the responsibilities, codes, and standards for which a profession is accountable and keeps stakeholders as the focus when making decisions regarding the profession (Shapiro & Stefkovich, 2005). Within the ethic of profession is the integration of the ethics of critique, care, and justice (Starratt, 1991). The ethic of critique focuses on a profession's current issues by deconstructing current processes and procedures and evaluating the profession's best, evidence-based practices. Evidence-based practices provide a deeper look into a profession's current practices, experiences, and research which allows a leader the opportunity to challenge the status quo (Mathur & Corley, 2014; McKibbon, 1998). A leader can decide to change a process or

procedure based on what they learned through the ethic of critique. The ethic of critique is important because it allows for deconstructing a process or procedure to understand if it continues to meet the needs of those involved.

The ethics of care and justice provide a theoretical framework to reconstruct a new process or procedure based on what was learned from the ethic of critique. The ethic of care emphasizes the value of people and their needs over principles or rules. However, this holistic, needs-centered approach in decision making may not be what is fair for all people. Therefore, the ethic of justice is important because it supports what is fair and just for all individuals. The impartial, objective approach to decision making may follow principle or rules, but may not meet the needs of all people (Botes, 2000; Mathur & Corley, 2014). Both the ethic of care and justice have their limits however, when used together when making decisions, the two ethical theories complement each other and provide a balance between a needs-centered approach and what is fair to the greatest number of people.

Together, the integration of the ethics of critique, care, and justice becomes the ethic of profession, which offers a framework to evaluate a profession's current practices based on its responsibilities, codes, and standards and to decide if those practices are what is most fair and just for the stakeholders, or greatest number of people, affected by the decision (Stefkovich & O'Brien, 2004). The ethic of profession served as a lens for Stefkovich and O'Brien's (2004) study to examine how healthcare education leaders make decisions based on their professions' responsibilities, codes, and standards while considering the stakeholders' needs.

The utilitarian view of the principle of benefit maximization provides a framework which supports that the most just decision will result in the greatest benefit to the most people. Strike et al. (2005) asserted that the principle of benefit maximization considers the integrity of our

actions based on the consequences of those actions. Therefore, when faced with a decision, "once we know what is good, the best decision is one that maximizes good outcomes" (Strike et al., 2005, p. 17). A leader can look to those who govern the responsibilities, codes, and standards for its profession when considering what is good for the profession.

Significance of the Study

With a dearth of research on IPE in radiography programs (Karnish et al., 2019), additional studies will contribute to bridging the information gap. This is important because bridging the information gap will provide more insight on how IPE is being used in radiography education. If more information can be collected regarding the use of IPE in radiography education, then strategies can be created to address the barriers that may be preventing the integration of IPE in radiography education. Aiming efforts toward combatting the challenges preventing radiography programs from implementing IPE is critical in assisting these programs in making IPE decisions. Once strategies are employed to overcome the challenges preventing IPE implementation, radiography students will be more likely to receive the benefits of IPE and enter the workforce as a prepared member of the healthcare team.

Radiography program directors oversee what is taught in the curriculum and thus the implementation of an experience such as IPE is dictated by them. Understanding whether JRCERT-accredited program directors' attitudes, knowledge, and perceptions of IPE impact the use of IPE in their programs will provide a starting point on how to create standards and resources to help program directors make informed decisions about the use of IPE grounded in evidence-based practices.

Delimitations

This study included the following delimitations:

1. Only JRCERT-accredited radiography programs were included in the study. Not all radiography programs are accredited by JRCERT and thus are not accountable for meeting the same minimum standards as JRCERT-accredited programs.
2. The survey window for responses was four weeks, with a reminder to complete the survey being sent out after weeks two and three, to allow maximum participation within the time frame of the study.
3. Radiography program directors were chosen as the focus of the survey as opposed to all leadership positions in a program. Program directors are typically the decision makers behind the curriculum for radiography programs.

Assumptions

1. Program directors who participated in the survey accurately represented their own opinions of their programs.
2. Survey participants understood and interpreted the survey items accurately and responded honestly.
3. The survey received enough participant responses to be representative of the majority of JRCERT-accredited radiography programs.
4. Survey respondents were program directors of JRCERT-accredited programs.

Definitions of Key Terms

Effectiveness – successful in delivering a desired result.

External environment – any outside factors impacting or influencing the educational program or sponsoring institution.

Health care – refers to an action provided by a professional.

Healthcare – refers to a system.

Healthcare education – education needed to work for any healthcare profession.

Internal environment – any factors impacting or influencing the educational program from within the sponsoring institution.

Interprofessional education (IPE) – two or more healthcare professions learning about, with, and from each other.

Joint Review Committee on the Education of Radiologic Technologists (JRCERT) – the accreditation board for radiography education programs.

Medical error – "the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim" (IOM, 1999).

Patient-centered care – concentrates on the patient as a whole and provides care based on the patient's individual preferences, values, and needs.

Program director – the person responsible for making leadership decisions for a radiography program.

Radiography programs – refers to JRCERT-accredited programs geared toward educating students at the undergraduate level in radiologic sciences.

Stakeholder – any person or group who has a stake in the decisions made by a program director.

Status Quo – maintaining the required minimum standard.

Team-based care – healthcare workers from a variety of professions come together to work cohesively and collaboratively to care for the patient. Also known as Interprofessional Care (IPC).

Use of IPE within the radiography program:

Mandatory use – IPE is implemented into the radiography program curriculum and all students are required to participate in IPE experiences.

Elective use – IPE is not implemented into the radiography program curriculum, but students can elect to participate in IPE experiences offered within the program's sponsoring institution.

No use – IPE may or may not be offered by the sponsoring institution, and radiography students elect not to participate.

Organization of Study

The organization of the remainder of this dissertation includes Chapter 2, which provides a detailed literature review and background of IPE through the lens of ethical leadership theories. Chapter 3 is an account of the research methodology used in the current study and the method of data collection used. Chapter 4 provides discussion of the results and the interpretation of the data collected from the study. Finally, Chapter 5 summarizes the study's findings and includes recommendations for future research.

CHAPTER II. LITERATURE REVIEW

Introduction

Healthcare has evolved to focus efforts on patients to provide a holistic care experience centered around each patient. Patient-centered care involves healthcare teams working together to collaborate with the patient to provide the best experience possible that fulfills the patient's needs (Emami & Safipour, 2013; Greene et al., 2012; Wagner et al., 2017). Historically, healthcare professionals from fields such as medicine, nursing, dentistry, medical imaging (radiology, nuclear medicine, and sonography), dietetics, medical laboratory science, occupational and physical therapy, respiratory therapy, speech and language pathology, and physican assistants (ASAHP, 2020), worked independently within their own disciplines and the patient took a passive role in their own care.

As healthcare shifted to patient-centered care, patients began to take an active role in their care and healthcare professionals from different disciplines began providing care as a team which is known as team-based care (Eklund et al., 2019; Longtin et al., 2010; Murgic et al., 2015; Wagner et al., 2017). When healthcare shifted to individualized, patient-centered care that required a team-based delivery, there became a need for healthcare educational programs to produce professionals who were trained in providing the type of team-based care required in the workforce (WHO, 2010). Interprofessional education was created as a tool to help educators from a variety of disciplines teach a collaborative approach to patient-centered care that could be integrated into their program curricula.

Educators have been discussing the need to incorporate collaborative learning between healthcare professions into program curricula for almost fifty years (IOM, 1972). Over the years, many healthcare professions have integrated the use of IPE into their educational accreditation

standards, thus requiring educational leaders to incorporate IPE into their program curriculum. However, not every profession mandates the incorporation of IPE into their healthcare education program curriculum, leaving open the option for educational leaders to determine the level of IPE use in their programs. During the decision-making process leaders of healthcare education programs must undergo for curriculum development, multiple factors influence the decision to use IPE in the curriculum.

In this literature review, the decision-making process to implement IPE into healthcare program curricula will be evaluated and the impact this decision has on students' learning and interactions with peers, as well as patient care outcomes, will be assessed. Other factors in curriculum development that will be evaluated include the stakeholders; professional, institutional, and accreditation standards; ethical considerations as a leader; and how an educational leader's attitudes, knowledge, and perceptions of IPE influences the decision-making process of implementing IPE into a healthcare education program. The goal of this study is to examine radiography program directors' attitudes, knowledge, and perceptions of IPE to better understand the level of use of IPE in their programs.

IPE Effectiveness

Advocating for IPE in healthcare is based on its positive influence on student learning, student interactions with peers, and patient care outcomes (Reeves et al., 2013). Researchers Guraya and Barr (2017) performed a systematic review and meta-analysis in their study to determine the effectiveness of IPE on students' knowledge, skills, and attitudes about collaborative teamwork. The authors examined twelve pre-post design studies involving various types of healthcare fields. The objective evidence provided by the meta-analysis supported significant improvement in pre-post scores after an IPE module was embedded into the learning

experience. Guraya and Barr found that incorporating IPE into healthcare education classrooms demonstrated an improvement in students' skills, knowledge, and attitudes in a variety of experiences including increased satisfaction in performance, improved knowledge in approaches to resolve complex issues, and it aided in dispelling stereotypes about other healthcare professions.

Student Learning

Effective IPE involves the careful understanding of each member's individual role on the care team. A successful IPE experience should include a strong connection of theory to practice and foster student reflection on the learning experience.

The overall positive impact of IPE experiences is evident in various areas of students' individual learning experiences. Confidence and understanding of a student's future role as a professional on the healthcare team is a critical component to team-based care. Titzer et al. (2015) found that students reported a better understanding of their individual roles after interacting with peers from the healthcare team during their IPE experience. Not only did IPE increase students' understanding of their individual roles, but Wamsley et al. (2012) cited that students who participated in an IPE experience perceived that they had an increased understanding of the other professional roles on the healthcare team. Together with the understanding of each member's role, increased confidence in their contribution as part of a team was also found in students after participating in an IPE experience (Buckley et al., 2012; Costello et al., 2018).

Wamsley et al. (2012) also suggested that students who participated in IPE experiences were found to have an improved attitude toward valuing teamwork and efficiency after the experience. However, Grice and McCorkle (2016) found mixed reviews of attitudes post-IPE

experience. Using a sample of pharmacy and nursing students, Grice and McCorkle examined pharmacy students' attitudes and readiness for interprofessional learning in a quantitative, pre-post study. Prior to the IPE experience with the nursing students, 96% of the pharmacy students agreed or strongly agreed that learning with students from another profession will make them a more effective member of the care team. However, after the IPE experience, only 69% of the pharmacy students felt learning with students from another profession will make them a more effective member of the care team. The mixed reviews between pre-post experience was possibly linked to the limitation that not all data was accessible due to the experience being voluntary and not all post-surveys were submitted (Grice & McCorkle, 2016). In contrast to the mixed reviews in Grice and McCorkle's study, Wang et al. (2019) conducted a systematic review of six pre-post design studies to measure attitudes about interprofessional teamwork using IPE. The total scores of all six studies revealed that IPE had a positive influence on students' understanding of collaboration and their attitudes about interprofessional teamwork.

Outside of improved confidence, understanding, and attitude, students also reported having more opportunities to reflect on their learning experiences after participating in IPE (Buckley et al., 2012; Roy et al., 2016). Hendricks-Ferguson et al. (2018) reported that when reflection was part of the IPE experience, there were enhanced shared decision-making discussions amongst the students. For example, Hendricks-Ferguson et al. examined a random sample of 42 case study reflection assignments out of 275 healthcare profession students. The undergraduate students represented eight healthcare professions including nursing, physical therapy, occupational therapy, biological lab science, nuclear medicine technology, radiation therapy, athletic training, and nutrition and dietetics in the qualitative study. Common themes from the students' case study assignment reflections revealed evidence supporting that IPE

provides a means to develop an understanding of patient-centered care and the skills needed in shared-decision making discussions, increases respect for other healthcare professions' roles and contributions to the care team, and develops an understanding of how to apply ethical principles during decision-making discussions with patients. Regarding individual learning, students also reported an improved connection between their IPE experience and concepts learned in the classroom, such as simulated experiences in the surgical environment.

In another study, radiography, nursing, and surgical technology students participated in a surgical simulation experience which allowed students from different professions to communicate with each other in a simulated environment as opposed to the real-world surgical environment (Boardman, 2017). Simulation experiences allows students to practice their skills in a low-risk environment. Students can make their own decisions, think critically, and ask questions in a safe, learning environment. Furthermore, Pole et al. (2016) studied athletic training students who participated in an interprofessional team course with students from seven other health professions. Using case-based learning, the students learned attributes of effective interprofessional team-based practice and the professional roles of athletic trainers. The students' reflections revealed various themes experienced during the IPE activity, including:

> increased understanding of the training and role of athletic training students, the importance of communication as the patient transitions to different settings and teams, insight into essential information necessary to assure patient-centered care, and a new appreciation for the needs of a patient. (Pole et al., 2016, p. 243)

Alongside reflection opportunities during IPE experiences, IPE provides the student a chance to transition from theory taught in the classroom to practice. Scenario-based activities used as part of the IPE experience have resulted in very positive feedback (Boardman, 2017;

Paige et al., 2014). Boardman (2017) stated that both program directors and students reported positive responses to an activity involving a life-size mannequin to enact a scenario of a patient they would potentially care for in the field. Students from Boardman's study specifically stated the importance of being able to experience real-life scenarios or situations in a controlled setting as well as the opportunity to work with students from other professions during those activities. As an affirming point to the field of radiology and the debate over utilizing IPE experiences, radiology students had a "positive and energetic response" to the activity and "would like to see this incorporated into their courses" (Boardman, 2017, p. 161). Moreover, Buckley et al. (2012) reported findings from a pre-post design study of a mix of undergraduate and graduate students that IPE experience activities which frequently used simulated scenarios provided a valuable educational experience to prepare students to be reflective practitioners in their clinical practices.

Finally, Nurumal et al. (2020) indicated a significant increase in student self-efficacy after participating in an IPE experience in their final year of their healthcare program compared to students in their first year of the program who participated. In a quantitative study of dental hygiene, medical laboratory technology, and nursing students, Cino et al. (2018) indicated that students reported a higher level of self-efficacy in working as a team and defining roles immediately after participating in an IPE experience. Similarly, in a pre-post design study, occupational and physical therapy students demonstrated a significant improvement in self-efficacy and improved learning outcomes in interprofessional interactions and teamwork after an IPE experience (Ivey et al., 2018). Paige et al. (2014) also discovered students reported an immediate improvement of awareness for team-based behaviors and skills in themselves and noted the beneficial aspects of IPE experiences to their education. Overall, the positive impact

that IPE has on students' individual learning experiences warrants consideration for implementing IPE into programs seeking to improve the student learning experience.

Student Interactions with Peers

A critical component of patient-centered health care is team-based care. In IPE, student interactions with peers are highly prioritized in order to produce professionals who effectively integrate into the workforce once completing their education. When students spent an IPE experience sharing details about each profession included on the healthcare team, students found many shared values amongst the team members (Wynarczuk et al., 2019). In a mixed-method study of students from six different professions, including athletic training, health management, occupational therapy, physical therapy, physician assistants, and speech-language pathology, Manspeaker et al. (2017) cited students as having a higher level of respect for other healthcare professions on the team when they had the opportunity to work directly with other disciplines in the IPE experience. Manspeaker et al. (2017) also noted that participants recognized shared values within the professions and "the core values of patient respect, privacy, and integrity were upheld throughout disciplines" (p. 633).

Similarly, after an IPE experience, students also recognized how much more confident they felt in understanding their role on the healthcare team and sharing their role with the other team members (Mouser et al., 2017). Manspeaker et al. (2017) reported that students felt an enhanced understanding of the roles of others and their own role within the healthcare team after an IPE experience. Interestingly, Wynarczuk et al. (2019) found that when students discussed each role on the healthcare team, they were able to address misinformation and misconceptions about their roles. Understanding the roles of each member of the care team helps students

understand the knowledge and skills each member brings to the team and can help diminish professional stereotypes.

IPE provides a platform for students to discuss different healthcare professions with their peers and to discover the commonalities between the professions, including extensive didactic and clinical learning, approaches to care, practice settings and patient populations, and how various professions are regulated by state practice acts, licensure, and certification requirements (Wynarczuk et al., 2019). As illustrated in Manspeaker et al.'s (2017) research, students reported a difference in perspective after the IPE experience when it came to their views on other professions. At least one student stated that before participating in IPE they felt that their profession was "very different" from other professions, but after working with the students from the other professions, it was "easier to recognize how well we all deal with problems together" (Manspeaker et al., 2017, p. 633).

As evidenced by many studies, a common benefit that IPE provides is the opportunity for students to engage in teamwork. Zaudke et al. (2016) noted the positive impact that IPE had on teamwork. Students demonstrated improvement in their ability to manage crucial conversations and conflict resolution related to teamwork when IPE was aligned with their clinical experiences. Furthermore, a study by Buckley et al. (2012) also found students to have an enhanced perception of the importance of teamwork after noting the IPE simulation activity was a valuable learning experience. IPE was reported to be a "promising approach to promote effective interprofessional collaborative practice" by Ward et al. (2018, p. 263) after their study suggested IPE provides an opportunity for various objectives of learning, including interprofessional teamwork.

A beneficial outcome of effective teamwork is the impact it has on the patient. In their research, Kara et al. (2018) indicated that a result of the IPE experience was the insight students reported on how teamwork promotes positive patient outcomes in an acute care setting. Students' awareness of the impact their work has on the patient was also evident when students recognized the necessity of each team member's contribution to the bigger picture in patient care after an IPE experience (Manspeaker et al., 2017). Similarly, Davis et al. (2021) asserted that students gained a better understanding of what the healthcare team brings to the patient experience after participating in IPE, affirming the concept that IPE provides an opportunity for students to develop a deeper sense of collaboration that results in patients receiving more effective care.

Among the important skills practiced in IPE experiences, effective communication may be one of the most apparent IPE experiences have been found to be valuable opportunities for students to practice their communication skills and teamwork (Zaudke et al., 2016). Boardman (2017) highlighted the benefit of exercising communication skills in IPE experiences, sharing that a program director from the study noted IPE as providing students with the ability to practice communicating with students outside of their profession and an opportunity to share their own knowledge with others. Communication between professions provides learning opportunities to help eliminate the "professional silos" of an outdated system of healthcare education (Boardman, 2017, p. 157). In support of Boardman's findings, Davis et al. (2021) also suggested communication during IPE experiences contributed to important interactions amongst the team members. As illustrated by Manspeaker et al. (2017), students reflected that IPE experiences provide a valuable opportunity for them to communicate with other healthcare professional students and to discuss topics related to their learning. Overall, the opportunity IPE provides for improving teamwork warrants its consideration for healthcare education programs that prioritize

team-based care. The impact IPE has on improving teamwork supports the call for healthcare education leaders to choose to implement IPE into their curricula.

Patient Care Outcomes

Alongside the positive impact IPE has on individual student learning and student interactions with peers, IPE impacts the patient experience as well. Patient-centered care focuses on the patient experience, and at the core of the patient experience is patient satisfaction. Marcussen et al. (2020) indicated that in an IPE experience involving actual patients, there were higher patient satisfaction scores on the post-care surveys. Although IPE experiences involving actual patients are unique compared to most IPE experiences which mostly involve simulated patients, Marcussen et al.'s experience proved to be important and positive for both the students and patient. In a study by Schussel et al. (2019), a total of 27 health science students from medical, nursing, nutrition, and pharmacy programs participated in an IPE experience involving medication therapy management in a clinical setting. The students cared for actual patients with chronic health conditions. The results of the IPE experience contributed to an improved service provided to the patients. The study collected direct feedback from patient satisfaction surveys where patients "strongly agreed" that they were "satisfied with the students for [the] overall care provided" (Schussel et al., 2019, p. 378).

In contrast, Wen and Schulman's (2014) systematic review reported inconsistent results when reviewing the impact of team-based care on patient satisfaction. The systematic review included 10 studies which reported dichotomous data that indicated team-based care had a positive impact on patient satisfaction. However, they also reviewed seven additional studies which reported continuous data that indicated that team-based care had no significant impact on patient satisfaction. The inconsistent results may be due to the multiple factors that go into

patient-centered care, and accounting for all factors would be difficult. However, when considering the outcomes of IPE include “increased respect, communication, and consultation among professionals in different disciplines” (Li, 2007, p. 54), this aligns with aspects that have been linked to improved patient outcomes and satisfaction.

Another component of patient-centered care is professionals providing care that considers patient safety and minimizes medical error. It has been noted that ineffective communication within the healthcare team can increase opportunity for medical error (Mujumdar & Santos, 2014). As already pointed out, IPE experiences promote effective communication and provide a platform for students to practice communication skills (Boardman, 2017; Davis et al., 2021; Zaudke et al., 2016).

Although Lochner et al. (2018) received mixed reviews on changes in perspectives on patient safety after an IPE experience, the researcher asserted that at the end of the IPE experience, some students were more aware of the safety aspects to patient care which could reduce the chance of medical error in the field. There was no statistically significant difference in the students’ attitudes toward patient safety from before and after the experience in Lochner et al.’s study which could be due to the emphasis that it put on patient safety throughout the IPE experience. However, the study did report that the IPE experience made some students note the difficulty in dealing with patient safety when they are distracted by the everyday tasks of caring for patients.

Overall, Lochner et al.’s study provided evidence to support that IPE could provide an effective opportunity to teach students more about patient safety. Moreover, there has also been evidence that students reported being more prepared for difficult scenarios after they had the opportunity to experience simulated scenarios in the controlled or “safe” setting of an IPE

experience (Buckley et al., 2012, p. 368). Sims et al. (2015) also reported that students' experiences during IPE activities resulted in improved patient safety amongst other benefits

Another component of patient-centered care is the quality of care provided to the patient. Guraya and Barr (2017) conducted a systemic review consisting of 12 studies that reported a significant change in student perception and awareness of the quality of care provided to patients after participating in an IPE experience. Although Reeves et al. (2010) noted that currently there is not much evidence on the direct impact of IPE on patient outcomes, Buckley et al. (2012) asserted it is still worth noting that the indirect impact IPE has on healthcare professionals, such as increased communication and team-based care, would contribute to improved patient care and outcomes.

In contrast to Reeves et al.'s claim, Brewer and Flavell (2019) noted that in a clinical IPE experience, healthcare students ($N = 13$) from physiotherapy, occupational therapy, speech pathology, nursing, and counselling psychology received negative feedback from the patient in their care when the students neglected to work together to provide the patient care. The miscommunication among the healthcare team led to the patient being asked to repeat similar activities, leading to the patient being frustrated and the quality of their care being negatively impacted. Since reflection was part of the IPE experience in the study, the students were able to reflect on the feedback they received from the patient and acknowledge the importance of collaboration and communication with other team members to avoid the issue of redundancy for the patient during their care.

Overall, although some literature suggests there is not enough evidence supporting the positive impact of IPE on patient outcomes, the evidence presented in this review suggests otherwise.

Curriculum Development

Many factors guide educational leaders' decisions in curriculum development in order to determine the needs of a healthcare education program, including stakeholders, accreditation standards, needs of the profession, and institutional goals. As expectations of these factors change, educational leaders must consider how to address changes and whether to adjust the current curriculum as a result.

Stakeholders

Curriculum development has shifted from teacher-centered to a more comprehensive consideration involving stakeholders to evolve with the ever-changing environment of healthcare (Keogh et al., 2010). Belita et al. (2020) conducted a meta-analysis of 12 studies and highlighted students, faculty, clinical institutions, and patients as key stakeholders considered during curriculum development. Virgolesi et al. (2014) indicated in a meta-analysis of 13 healthcare education studies that the involvement of stakeholders occurred when significant curriculum changes were being considered or when special training was required.

Educational leaders' consideration and inclusion of stakeholders during curriculum development is critical to generate an idea of shared ownership with the stakeholders (Sidebotham et al., 2017). According to Hearld et al. (2018), neglecting to consider stakeholders can lead to "a lower likelihood of maintaining or increasing one's participation in the future" (p. 198). In healthcare education curricula, if certain stakeholders feel they are not valued as much as other stakeholders in curriculum changes that impact them directly, the likelihood of their involvement in the curriculum development process may be less than if they perceive that their contribution is valued. In this respect, key stakeholders to focus on in healthcare education are the students, faculty, clinical institutions, and patients.

As the users of the curriculum, students are stakeholders who are commonly considered during the curriculum development process. In a systematic review of 12 nursing education studies, Belita et al. (2020) emphasized themes which developed from positive stakeholder engagement which included positive leadership, empowerment, a sense of ownership, and a culture of equality. The impact of considering students as key stakeholders can lead to a transformative process for students and other stakeholders. St. John-Matthews et al. (2020) also highlighted students as a significant stakeholder in the process of curriculum development. However, there could be some difficulty with including students in curriculum development decisions due to a lack of research on how to engage students in the curriculum development process.

Faculty is another stakeholder group that has been noted as important to curriculum development (Belita et al., 2020). Belfiore et al. (2018) found faculty buy-in and support of curriculum changes can be significant in the transition from old to new curricula. Belfiore et al. also asserted faculty understanding and support of new curriculum changes is critical to curriculum development. When faculty members are not involved in curriculum development, issues can arise due to the importance of faculty support in the process. In the results of their qualitative study of 20 medical faculty participants, Morcke and Eika (2009) reflected that the faculty members played a minimal role in curriculum design. The authors found their results worrisome to the point that they warranted further investigation of medical faculty's involvement with curriculum design to explain the implications of their study. Giving faculty a voice during curriculum development and/or change can promote unity during the change process, transparency for the reasons of the change, and a better understanding of how the curricular change can impact student learning.

Alongside students and faculty members, clinical institutions where students conduct their clinical experiences are valuable in the consideration of curriculum development. Jeffries et al. (2013) cited that the redesign for a clinical experience was positive when clinical sites were involved in the discussion of the redesign process. Moreover, Nosek et al. (2017) developed a model for revising healthcare curricula that had a positive impact overall and highlighted the importance of considering external facilitators such as clinical sites. Tiwari et al. (2002) stated that when other stakeholders outside of faculty members are considered in the curriculum change process, the likelihood of the needed education being provided to the students was higher.

Finally, healthcare education curriculum development should consider the patient in the process, especially due to the shift to patient-centered care in modern healthcare. A unique but insightful study conducted by Molley et al. (2018) explored the involvement of patients in the curriculum development process. As a result of the study, the patients were found to have a positive experience participating and enjoyed sharing their experiences with the curriculum developers. Two important factors highlighted from the patients were clear communication with the patients and managing the patients' expectations during the curriculum development process. Similarly, in other studies, when patients were actively involved in clinical experiences dictated by the curriculum development process, the patients reported the experiences to be "positive and enjoyable" (Wykurz & Kelly, 2002, p. 819). It was also cited that the patients "appreciated sharing their knowledge, using their condition to facilitate learning, and contributing to doctors' training. Some patients felt empowered by their experience" (Wykurz & Kelly, 2002, p. 819). The students reported that they felt more comfortable and confident in their clinical experience because of the active participation from the patient in the curriculum development process.

Accreditation Standards

In healthcare education, many programs are guided by their accreditation standards. Accreditation is valued for its ability to "enhance health care outcomes because of its ability to influence and standardize the quality of training programs, continuously enhance curriculum to align with population needs, and improve learning environments" (Frank et al., 2020).

Braithwaite et al. (2010) was able to show the direct positive impact that accreditation standards had on desired clinical and institutional outcomes. In Braithwaite et al.'s study, correlations between accreditation performance with organizational culture and climate, consumer involvement, leadership, and clinical performance were assessed. The results of the study suggested that using accreditation standards helped predict leadership behaviors and reflected a positive trend between accreditation and clinical performance, further emphasizing the role accreditation plays in healthcare education programs. Rose and Long (2010) suggested accreditation outcomes could be utilized as a feedback tool to improve quality and care by using the outcome results to expose areas of weakness and to track improvement progress from year to year in a healthcare education program. Keogh et al. (2010) agreed that accreditation standards are important in healthcare when staying on pace with current healthcare practices and the ever-changing environment of health care. The accreditation process is also beneficial since the standards reflect the current needs of the healthcare profession and desired health care outcomes (Frank et al., 2020).

The consideration of accreditation standards is a way to continually review and revise the updated, evidence-supported effective practices in a particular field and provide educational leaders a platform to implement new techniques or methods as they are discovered (Williams et al., 2021). Alongside the ability to act as an improvement tool, Frank et al. (2020) also asserted

that accreditation is utilized to maintain a method of "professional accountability and helps to ensure public confidence in self-regulated professions" (p. 5). The expectation that an educational program must provide documentation and support that it is providing an education in alignment with the standards of the accrediting body acts as a catalyst for educational leaders to meet these expectations within the curriculum development (Frank et al., 2020).

Due to the frequent changes occurring in healthcare and the accreditation standards acting as a platform that reflects the significant changes in the field, educational leaders lean on these accreditation standards to provide the most updated curriculum content for their students.

Needs of the Profession

In healthcare education, an objective of every program's curriculum is to produce qualified healthcare professionals for the workforce. When graduates of a healthcare education program are required to pass a certification exam to qualify as a member of the profession, the content specifications of the certification exam must be considered during curriculum development to ensure graduates are prepared to successfully pass the exam.

Certification exam content for healthcare professions focuses on the specific content needed to work in a particular profession. However, in the current climate of patient-centered care, to provide the best care possible to a patient, a healthcare professional also needs to learn about other areas of healthcare and how all members of the healthcare team contribute to a patient's care. This was affirmed by Parson et al. (2018) who discovered that a competency-based curriculum led to improved patient outcomes as a result of improved training of the students. Higher competency can be achieved by educational leaders aligning their curriculum with the needs of the profession (Obadeji, 2019).

Obadeji (2019) highlighted the need for a curriculum that provides the framework to encompass the "competencies, skills, values, and attitudes" for students to become effective healthcare professionals in the 21st century (p. 34). In the current healthcare climate, stakeholders prefer methods supported by evidence (Williams et al., 2021), and thus evidence-based practices can be utilized to implement educational content that supports the needs of the profession while also meeting stakeholders' interests.

The impact of evidence-based practice is felt by the students directly. As indicated by Thomas et al. (2017), students "acknowledge that evidence-based practice is a foundation of the profession and as such, it needs to be emphasized in both the school and clinical environments" (p. 10). Students also stated the use of evidence-based practice is of the "utmost importance" in their education and that the consistent use of evidence-based practice should be included in healthcare curricula (Thomas et al., 2017, p. 10). Hence, when educational leaders make decisions regarding curricula development, evidence-based practice is a valuable tool to utilize to implement content that considers the needs of the profession.

Institutional Goals

In addition to other considerations for curriculum development, educational leaders are encouraged to meet the institutional goals, missions, and values of their college or university. Huntington et al. (2018) discussed the expectation of an academic department for medical education to consider institutional needs when considering changes in the curriculum and developed a tool to incorporate the institution's educational goals and values as well as stakeholders' perspectives in order to meet the expectations of the institution. This highlights the careful consideration of institutional goals during curriculum development. When discussing current trends in healthcare education, Thibault (2020) reflected six key themes seen across the

United States, including IPE to prepare more professionals for collaboration; patient, community, and chronic disease-oriented clinical education; education focused on social determinants of health; life-long learning of health professionals; competency-based education; and more use of upcoming technologies in educational settings.

As health care evolves and professional goals are reprioritized to fit the needs of current healthcare issues, healthcare education will also continue to evolve. As a direct result of this evolution, healthcare-focused institutions and programs will be expected to continually align their own institutional goals with the new priorities to stay on pace with the current healthcare climate. Therefore, curricula developers at these healthcare-focused institutions and program leaders need to adjust to the new goals to accommodate the new needs of healthcare. This adjustment may involve the revision of old practices and the adoption of new strategies within their curricula that better address the newly established priorities.

Choice of IPE Implementation

Educational leaders must make decisions that consider the change of current curricula and potential implementation of new teaching strategies. When making these decisions, educational leaders weigh certain factors to determine if a new teaching approach is worth implementing, which involves assessing the ethical, practical, and personal considerations associated with the method. When considering the topic of IPE as a new teaching strategy for teaching team-based, patient-centered care, various factors influence the decision of an educational leader to implement IPE, especially if the decision is left to their discretion.

Ethical Considerations

Leadership involves making decisions that enact change or maintain the status quo and continue with current processes or practices (Vogel, 2012). According to Mathur and Corley

(2014), ethical leadership involves making decisions based on moral principles, values, and beliefs. However, ethical leaders may base decisions on their own moral principles, values, and beliefs and not consider how their decisions affect others. Mathur and Corley suggested that educators play an important role in students' educational journey toward their end goal of graduating and becoming a healthcare professional. Therefore, when decisions are being made about what students need on their educational journey to achieve their end goal, educational leaders must consider how their decisions affect students and other stakeholders.

Ethics are embedded in both the healthcare profession and the education of the profession. Each healthcare profession is governed by an organization that constructs a set of responsibilities, codes, and standards for its professionals. Members of the profession are ethically bound to provide services to their patients within the parameters of those responsibilities, codes, and standards (HCCA, 2018). Healthcare ethics are created with the intention of providing the most appropriate environment for the stakeholders of the profession (Polczynski et al., 2019). Under the ethic of profession, educational leaders are encouraged to use the values and ethics of their profession and the needs of stakeholders during the decision-making process rather than their own values and ethics (Stefkovich & O'Brien, 2004).

In the field of radiography education, program directors look to the American Registry of Radiologic Technologists (ARRT), the American Society of Radiologic Technologists (ASRT), and the Joint Review Committee on the Education of Radiography (JRCERT) for guidance and accountability. In relation to the ethic of profession, multiple perspectives, such as the needs of the patient, the profession, and the students, need to be considered in the decision-making process for the curriculum (Belita et al., 2020; Han & Vapiwala, 2019; Rubin et al., 2018). Evidence-based practice is an approach used to assess the needs of the stakeholders in a

healthcare profession and to evaluate the best practices which provide the best quality of care to patients (McKibbon, 1998). In the context of this dissertation study, the ethic of profession encourages decision making using the perspective of the ethical practices outlined by the guiding authorities, ARRT, ASRT, and JRCERT, rather than solely based on an educational leader's attitudes, knowledge, and perceptions of what will best prepare students for the workforce.

The ethic of profession is based off of the integration of the Starratt (1991) ethics of critique, care, and justice leadership model and supports the idea of evaluation during the decision-making process and consideration of all stakeholders impacted by the decision (Shapiro & Stefkovich, 2005). The ethics of critique, care, and justice provide a valid framework to help guide educational leaders in their decision-making process as they consider the implementation of IPE into their programs.

Ethic of Critique. The ethic of critique calls organizational leaders to challenge the status quo by asking what perpetuates the status quo and who benefits from maintaining it. Starratt (1991) indicated that leaders critiquing a process involves deconstructing the process and evaluating it based on the rules and standards that govern it as opposed to one's own self-interests. Similarly, Kouzes & Posner (2012) considered challenging the process a practice of exemplary leadership and an opportunity to find ways to improve.

For this study, radiography curriculum is guided by the ASRT, governed by the ARRT, and assessed by JRCERT standards. The ASRT is the professional organization that guides curriculum development by recommending relevant content that meet the needs of the profession and provides oversight of the professional standards of the radiography profession (ASRT, 2022).

The ARRT is the credentialling organization for radiography programs that governs the mandatory requirements for students to be considered eligible to take the certification exam needed to become a member of the profession (ARRT, 2022).

The JRCERT is an accrediting agency who assesses radiography education programs to ensure they meet the minimum standards to earn programmatic accreditation (JRCERT, 2022). Meeting the minimum requirements of JRCERT's standards is expected and required to maintain accreditation. If educational leaders of accredited programs base curriculum changes on the minimum requirements of JRCERT standards, then curriculum changes may not occur until JRCERT standards are updated, which occurs every ten years. It is the program directors' ethical obligation to evaluate their programs for continuous improvement.

In relation to the ethic of critique, radiography program leaders should consider and reassess the current JRCERT standards and evaluate other options for revising curricula. For example, evaluating evidence-based practices and considering other healthcare professions' educational best practices could be a means to assess radiography curricula. This would ensure curricula changes meet the needs of the profession and make the most just decision that will result in the greatest benefit to the stakeholders of the profession. The present study examined JRCERT-accredited radiography programs and how program directors' attitudes, knowledge, and perceptions of IPE affected the level of use of IPE in their programs.

Ethic of Care. Once processes are deconstructed through critique and evaluation, Starratt (1991) asserted that the process should be reconstructed based on the knowledge learned from the ethic of critique. Reconstruction of the process can begin with the ethic of care which focuses on the benefits to the stakeholders and their relationships between one another (Beck, 1994; Mayeroff, 2011; Starratt, 1991). Beck (1994) defined caring as knowing, responding

appropriately, and remaining committed to the connections made through the process. Mayeroff's (2011) reflection on caring was also relationally driven and suggested that through change, a relationship develops between the one who cares and the one being cared for.

When the ethic of care is applied to decision making, accounting for numerous considerations is not just to benefit the person making the decision, but to consider all those who are affected by it. Curriculum decisions should consider the students, their growth, and preparing them to be a member of the care team. This type of careful consideration during the decision-making process could indirectly impact the students' patients, other care team members, the profession, and other stakeholders (Mathur & Corley, 2014). Without considering the ethic of care, decisions can be made that benefit the decision maker but may not benefit the other stakeholders involved. When considering the ethic of care, the decisions made empathize with all perspectives and attempt to provide the best-case scenario for all those involved (Botes, 2000).

When applying the ethic of care to making curriculum decisions, radiography program leaders care for their students by preparing them for their profession and remaining student-centered and committed to making curriculum improvements based on the students' and other stakeholders' needs (Beck, 1994; Belita et al., 2020; Mayeroff, 2011).

Ethic of Justice. Whereas the ethic of care focuses on the care of individual students and stakeholders benefitting from program and curriculum decisions, the ethic of justice focuses on the rules and principles that govern the program and bases successful decisions on achieving the greatest good for the greatest number of people (Botes, 2000). When evaluating a process for potentially implementing changes to it, considerations are made for the stakeholders who will be affected by the changes.

The utilitarian view of the principle of benefit maximization provides a framework which supports the concept of the most just decision being one that will result in the greatest benefit to the most people. Strike et al. (2005) asserted that the principle of benefit maximization considers the integrity of our actions based on the consequences of those actions. Therefore, when faced with a decision, "once we know what is good, the best decision is one that maximizes good outcomes" (Strike et al., 2005, p. 17). A leader can look to those who govern the responsibilities, codes, and standards for a profession when considering what is good for the profession.

Regarding healthcare education programs, applying and meeting programmatic accreditation standards favors the greater good. In periods of evaluation of education curricula, considerations favor what is required to maintain accreditation compliance. However, necessary changes in professional standards, assessments, certifications, and external environments affecting the profession as a whole and how those changes impact the stakeholders may also be considered.

The ethic of justice keeps the scope of decision making clear and keeps educational leaders accountable as to why they make certain decisions (Callahan, 1988; Howe, 1993; Starratt, 1991; Strike et al., 2005). When an educational leader reflects on decisions they have made, this could be an act of justice for the stakeholders whom the decisions affect. Deliberating if one decision is more appropriate than another is considered reflective equilibrium. Reflective equilibrium refers to finding a balance between what is morally right and one's own beliefs, theories, and moral principles (Callahan, 1988). Under the ethic of justice, educational leaders should reflect on their practices and find a balance between how they have always practiced and what would most benefit the stakeholders involved.

Strike et al.'s (2005) principle of equal respect asserts that people be treated as an end rather than a means during the decision-making process. Therefore, educational leaders should not sacrifice stakeholders as a means to further their own goals. It is not just for an educational leader to make decisions that are more comfortable for them because it is easier. Instead, an educational leader must make decisions that are evidence-based and guided by the profession to remain just (Strike et al., 2005).

Integration of the Ethics of Critique, Care, and Justice Through the Lens of the Ethic of Profession. When evaluating a current method to consider a possible change, a leader can choose to follow the minimum standards required for the method, maintain the status quo, and continue to move forward using the current method, or they can choose to evaluate the current method through the ethical lens of the ethic of profession. When synthesizing the ethic of profession, critique, care, and justice, each theory plays a critical role in the decision-making process (Shapiro & Stefkovich, 2005). The ethic of profession provides a lens for viewing a current method while also considering evidence-based practices related to the current method and the responsibilities, codes, and standards of the profession.

Through the lens of the ethic of profession, the ethic of critique deconstructs the current process, and the ethic of care and justice are used to reconstruct a new process based on the needs of the stakeholders involved in the process as well as what is best for the greatest number of people (Starratt, 1991). Starratt (1991) integrated the three ethical theories into one framework to use as a guide in making a well-rounded decision:

> None of the ethics by itself offers an education administrator a fully adequate framework for making ethical judgments; together, however, each ethic compliments the others in a developmental context of practice. Each fills out an ethical perspective on policy choices.

> Because none of these ethics compels choice in every instance, one perfect choice does not exist; the three perspectives, however, enable one to make choices with the consequences more clearly delineated, to move toward the "best" choice under the circumstances, or to a choice that, although it favors one ethical demand, will probably be balanced later on by other choices. (pp. 186-187)

According to Starratt (1991), the ethic of critique involves leaders who critique a process by deconstructing the process and evaluating it based on the rules and standards that govern it as opposed to one's own self-interests. In the decision to implement IPE, Boardman (2017) supports that the use of IPE has a substantial positive impact on various stakeholders, especially the students and their patients. A decision that has a positive impact on the greatest number of people involved suggests that when IPE is optional, the choice to implement it would be the ethical choice because doing so would provide a better experience for the stakeholders involved.

When considering the ethic of care, ethical decision making occurs when all stakeholders are considered in the decision and the decision does not only benefit the decision maker (Starratt, 1991). When educational leaders consider how to address teaching patient-centered care to students, considering the implementation IPE as a teaching strategy is an ethical decision according to ethic of care. As a noted benefit, IPE provides a positive experience and outcome for multiple stakeholders and achieves the goal of teaching team-based, patient-centered care that is used in the workforce (Marcussen et al., 2020).

From the perspective of the ethic of justice, ethical decision making helps keep the scope of decision making clear, keeps educational leaders accountable for why a certain decision is selected, and focuses on the success of the greatest good for the greatest number of people (Botes, 2000; Juujarvi et al., 2019; Starratt, 1991). Regarding the decision of implementing IPE

for the purpose of using effective teaching strategies, IPE has been recognized to have a positive impact for all stakeholders involved and as an evidence-based practice (Thomas et al., 2017). Through the lens of ethic of justice, the implementation of IPE is an ethical choice for an educational leader to make for their program as it benefits all stakeholders while upholding the profession's accreditation standards.

Based on the literature presented in this chapter and the consideration of the ethic of profession, incorporating IPE into program curricula is the more ethical choice for teaching team-based, patient-centered care compared to the current process being used to teach these concepts. From the perspective of the ethic of critique, there are clear educational gaps when teaching team-based care from a textbook, and evidence supports that IPE can fill this gap (Boardman, 2017). From the perspective of the ethic of care, IPE leads to positive experiences and outcomes for multiple stakeholders involved in the process, including better preparing students for their profession (Marcussen et al., 2020). From the perspective of the ethic of justice, IPE has been recognized to have a positive impact for all involved and is deemed to be an evidence-based practice (Thomas et al., 2017).

From support throughout the literature examined in this chapter, educational leaders considering utilizing IPE as a method of teaching team-based, patient-centered care in healthcare education programs should consider that using IPE as a teaching method is an ethical choice when viewed through the lens of the ethic of profession.

Practical Considerations

In addition to ethical considerations, implementing a new learning strategy must be practical. It must be supported by evidence demonstrating that the benefits of the learning strategy outweigh the challenges of implementing it and that the challenges can be overcome. In

the decision to implement IPE, multiple challenges have been reported as potential deterrents to implementation (Teodorczuk et al., 2016; Wong et al., 2019). Sunguya et al. (2014) conducted a meta-analysis including 40 studies on the challenges and barriers of implementing IPE, discovering 10 common challenges amongst all 40 studies. These challenges included curriculum, leadership, resources, stereotypes, student diversity, IPE concepts, teaching, enthusiasm, professional jargons, and accreditation (Sunguya et al., 2014).

In healthcare education, incorporating IPE into the current curricula is a critical factor when considering IPE as a new teaching strategy. In challenges related to curriculum and IPE, Sunguya et al. (2014) included determining what content to include in IPE experiences, curriculum integration, time and schedule, and lack of flexibility to current curricula as barriers that prevent educational leaders from implementing IPE. However, the authors recommended involvement of students and faculty in the early stages of curriculum development to address these issues. Pecukonis et al. (2013) utilized this approach and found success in IPE implementation when students and faculty were involved in the planning strategy for the IPE experience. Paige et al. (2014) also reported that when students were involved in providing feedback on the IPE activity, the overall perspective of the IPE experience was positive.

Another challenge to address is the lack of leadership to lead the efforts in IPE coordination (Sunguya et al., 2014). This challenge refers to a program having difficulty coordinating with other programs to align an IPE experience involving various healthcare professions. The proposed solution to this concern was to recruit a champion, a person who is well versed on IPE, to lead the coordination, as well as committees dedicated to IPE at institutions to encourage more support for the implementation and use of IPE within each institution (Fook et al., 2013; Ho et al., 2008).

A lack of resources has been consistently reported as an issue in implementing IPE (Brashers et al., 2012). This could be in the way of a lack of materials, funding, or opportunities for IPE experiences. However, due to general use of the term interprofessional education, IPE experiences can be presented in various ways, including cost-effective workshops involving students from different healthcare disciplines to discuss similarities and differences amongst their professions (Wynarczuk et al., 2019). Real-life scenarios and simulations using volunteers or mannequins seem to be very impactful methods of IPE experiences (Boardman, 2017; Paige et al., 2014), and workshop-based IPE experiences were also shown to be effective (Wynarczuk et al., 2019).

Attitudes and stereotypes held by faculty about IPE experiences as well as the IPE concept and barriers to teaching it were noted as challenges to IPE implementation (Sunguya et al., 2014). This also aligns with the lack of education on the subject of IPE often seen in educational leaders as well as the faculty members involved in the process who are responsible for implementing and teaching IPE experiences at their institutions. A solution to this challenge is to educate these key personnel on the subject of IPE and have more established activities for easier IPE implementation by these personnel (Steinert, 2005).

Student diversity, lack of enthusiasm, and professional jargons are more challenges to IPE implementation which come at the concern that students from different professions have different characteristics, so when they are brought together for an IPE activity, they may have different learning needs, lack the motivation to fully participate, or some students might be unable to understand the language used in the activity (Sunguya et al., 2014). These challenges can be addressed by proper planning of the IPE activity, incorporating faculty members from each healthcare profession to meet the needs of each group of students, as well as making the

experience interactive, relevant, and confidence building to all healthcare professions involved (Boardman, 2017; Brewer & Flavell, 2019).

Lash et al. (2014) also emphasized the importance of incorporating the perspective of all healthcare professions into an IPE experience. According to Lash et al., in a study conducted on the perceived benefits and challenges of IPE, it was noted that the IPE experience perception was imbalanced between students from different programs involved in the study, which highlights the real-life application of concern about an imbalance amongst the patient care team in the clinical setting. The authors emphasized the need for IPE opportunities in the education curricula involving all healthcare professions to help address and resolve the imbalances between team members prior to becoming professionals in the healthcare field.

Finally, the last challenge related to IPE implementation is a lack of support through accreditation standards (Sunguya et al., 2014). When the choice of IPE implementation into a program is left optional, this could mean that there is not much support at the accreditation level when it comes to funding, backing, or educational resources, which were all noted as other issues commonly seen in Sunguya et al.'s (2014) meta-analysis of IPE challenges. Moreover, when accreditation does not require IPE experiences, lacking clear guidance on how to implement IPE could be a large barrier in the implementation process. This problem was also highlighted by Steketee and O'Keefe (2020) in that when there is not clear governance of the expectation of IPE, the implementation of IPE is difficult. As a result, Steketee and O'Keefe called for the need of clear governance of IPE implementation in order to have quality IPE experiences in healthcare education.

Personal Considerations

After considering both the ethical and practical components of the decision to implement IPE, the final component to consider when deciding to implement IPE is linked to the personal perspectives of the educational leader making the decision. The attitudes, knowledge, and perceptions of students, professionals, and faculty about IPE have been explored in healthcare education and have been found to enlighten the relationship of IPE and these stakeholders' personal perspectives of IPE (Hinderer et al., 2016).

Attitudes relating to IPE implementation refers to one's views toward the four core competency domains outlined by IPEC, including values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork (Hinderer et al., 2016). Knowledge relating to IPE implementation refers to how much someone knows about IPE (Hinderer et al., 2016). Perceptions relating to IPE implementation refers to ideas of interdisciplinary relationships with one's profession and other healthcare professions.

Dyess et al. (2019) found in seven studies that once students experienced IPE and working with other healthcare professions, they had a more positive attitude toward teamwork and communication. Likewise, Guraya and Barr (2017) conducted a meta-analysis of 12 studies that indicated improved attitudes toward collaborative teamwork in students after IPE experiences. Along with improved attitudes, students also reported improved knowledge and skills after participating in IPE experiences (Dyess et al., 2019). When students were asked about their attitudes and knowledge of each profession before and after an IPE experience, students showed to have a heightened awareness of the collaborative nature of healthcare and an increased understanding of healthcare professional roles (Mouser et al., 2017).

When healthcare professionals shared their perspectives on interprofessional communication in a survey, their responses greatly differed from the responses of students who participated in IPE indicated by other studies on this topic. Where students' responses to interprofessional communication were generally positive once they participated in an IPE experience (Dyess et al., 2019), the feedback from healthcare professionals on interprofessional communication in the workforce was negative (Verhovsek et al., 2009).

Verhovsek et al. (2009) found that participants reported difficulty in communicating with other healthcare professionals, other professionals did not understand the role of each participant's profession, and there was a lack of respect from other professionals for the participants' professions. Notably, this feedback is in sharp contrast to the typical feedback that students reported after participating in an IPE experience (Manspeaker et al., 2017). Manspeaker et al. (2017) cited students to have a better level of respect for other healthcare professions on the team when they had the opportunity to work directly with other disciplines in the study's IPE experience. This difference in perspective between professionals and students on the topic of interactions with peers might suggest the importance IPE has as part of the educational experience as well as a potential need to consider using IPE opportunities after entering the workforce to improve communication among the healthcare team and ensure each member understands the importance of one another's role.

As illustrated by the research, there are significant differences in the perspectives between students and professionals on subjects related to IPE, and educational leaders have the potential to fall into either category of student or professional. Boardman (2017) found that faculty members who participated in an IPE experience had a positive attitude overall from the activity and it was helpful in integrating theory to practice for their students. It was also noted

that faculty members felt much more willing to learn more about IPE when their students reported feeling enthusiastic about the experience and shared a desire to participate in similar activities.

Along the lines of knowledge, Yune et al. (2020) suggested that when faculty members had increased knowledge of IPE, they were less resistant to implementing IPE into their curriculum. Likewise, Hinderer et al. (2016) cited a significant correlation between knowledge and perception of IPE, determining that even when faculty members did not have as much knowledge of IPE, their perception was still positive. This suggests that educating faculty members on IPE could be a critical tool when beginning to explore IPE implementation and securing support for the change. However, it is worth noting that Hinderer et al. found that, like professionals in the workforce, some faculty members reported feeling undervalued by other professions.

Although there is literature on attitudes, knowledge, and perceptions of IPE from students, professionals, and faculty members, there is a lack of research on how these perspectives influence educational leaders' choice to implement IPE into healthcare curricula. One reason for this could be that many healthcare education programs are required to implement IPE by accreditation standards; however, not all healthcare education programs are required to implement IPE (Steketee & O'Keefe, 2020). Thus, the decision to implement IPE into a curriculum is left to each educational leader's ethical, practical, and personal considerations on the subject.

Summary

In this literature review, the impact of IPE on student learning, student interactions with peers, and patient care outcomes was discussed. Overall, IPE experiences had a significant

positive impact on student learning. Students expressed increased confidence and understanding of their future roles as a professional on the healthcare team. They also demonstrated improved attitudes toward teamwork and communication when reflecting on their IPE experiences. Participating in IPE experiences also provided opportunities for them to find the commonalities and differences between their and their peers' professions, including recognizing the shared values among different healthcare disciplines, which ultimately increased students' respect for their peers. Due to IPE's emphasis on interprofessional collaboration, the students had more opportunities to practice teamwork and to practice effective communication skills. Finally, the impact IPE experiences have on patients was discussed. This included improved patient care outcomes in relation to patient satisfaction, patient safety, and quality of care.

This review also discussed the considerations relative to the process of curriculum development, including stakeholders, accreditation standards, needs of the profession, and institutional standards. It was found that the consideration of stakeholders in curriculum development was important to account for students, faculty members, clinical institutions, and patients in the decision-making process. Utilizing accreditation standards as a tool for quality assurance and accountability to the profession when considering implementing IPE during the curriculum development process was also critical. Needs of the profession were addressed through evidence-based practices as part of the curriculum. It was also noted that institutional goals play a part in influencing the decision-making process during curriculum development for a program.

Lastly, this review considered the ethical, practical, and personal considerations of an educational leader's decision to implement IPE when IPE use is optional, making it the leader's choice whether to implement it into a healthcare program. The ethic of profession which includes

the integration of the ethics of critique, care, and justice, along with the principle of benefit maximization, supports the implementation of IPE as the ethical choice for an educational leader to make when the choice is their decision. The practical considerations of this choice do note the challenges educational leaders have to weigh when considering the implementation of IPE, such as discipline specific curriculum time restraints and content learning. However, there were proposed solutions for the common concerns reported in the studies on the challenges of IPE implementation, such as keeping IPE experiences small, manageable, and relevant to discipline specific content, indicating these challenges can be overcome. Finally, educational leaders' personal considerations impact the decision-making process for implementing IPE, but studies collected from students, professionals, and faculty members are not consistent enough to confidently predict the level of influence personal considerations have on an educational leader's decision to implement IPE into their curriculum.

Chapter 3 will describe the research design, method, and data analysis used in this dissertation study to examine the impact of program directors' attitudes, knowledge, and perceptions on the use of IPE in radiography education curriculum. An assumptions and data analysis will also be discussed for the present study.

CHAPTER III. METHODOLOGY

This descriptive, correlational study aimed to explore radiography program directors' attitudes, knowledge, and perceptions of interprofessional education and how these factors impacted their decision to use or not to use IPE in their programs. Understanding whether the attitudes, knowledge, and perceptions of IPE were associated with directors' use of IPE could be used to inform JRCERT standards and provide resources needed to promote the use of IPE by program directors. This chapter outlines the research design, specifics about the respondents, the research questions, and the instrumentation and procedures used to collect and analyze the data.

Research Design

This quantitative study used a cross-sectional, descriptive survey research design. Descriptive research design is applied when more information about a population is needed to identify current practice issues (Simon & Francis, 2001). Therefore, utilizing a descriptive research design for this study allowed for the assessment of IPE usage in radiography education and provided insight into the characteristics of program directors (i.e., attitudes, knowledge, and perceptions) that may be associated with IPE use in their programs. For this study, a cross-sectional group of radiography program directors was studied at a given time rather than over an extended period of time (Creswell & Creswell, 2018).

Research Questions

The following questions guided the study:

RQ1 What is the self-reported level of use of IPE in radiography programs?

RQ2a Are program directors' self-reported attitudes toward IPE associated with the level of use of IPE?

RQ2b Is program directors' self-reported knowledge of IPE associated with the level of use of IPE?

RQ2c Are program directors' self-reported perceptions of IPE associated with the level of use of IPE?

Respondents

A convenience sample of program directors *(n* = 262) working in JRCERT-accredited radiography programs was studied. According to Fraenkel and Wallen (1993), a convenience sample is a collection of readily available people to the researcher. Program directors from JRCERT-accredited programs were chosen because all JRCERT-accredited programs are required to meet the same minimum accreditation standards, ensuring the directors and programs evaluated for the study were comparable. In the context of JRCERT's accreditation standards, IPE is considered beyond the minimum requirements. For JRCERT-accredited radiography programs, the program director is responsible for any decisions beyond the minimum standards, meaning the decision to implement IPE is the director's choice. For this study, program directors were queried relative to their programs' current use of IPE as well as their attitudes, knowledge, and perceptions of IPE.

Instrumentation

Data for this study were collected utilizing the Use of Interprofessional Education (IPE) in Radiography Education survey (see Appendix A). The survey tool used for the study built on a pre-existing survey tool called the Interprofessional Perception, Knowledge, and Attitudes Scale (IPKAS).

IPKAS Versus the Use of Interprofessional Education (IPE) in Radiography Education Survey

Hinderer et al. (2016) developed the IPKAS survey to evaluate healthcare faculty's perception, knowledge, and attitudes toward IPE. The IPKAS survey consists of 23 statements scored on a 4-point Likert scale ranging from 0 = strongly disagree, 1 = disagree, 2 = agree, and 3 = strongly agree, with a total possible score ranging from 0 to 69 points. The 23 statements are divided into three subscales: perception, knowledge, and attitudes. The first seven statements focus on the participants' overall perception of IPE, resulting in a possible subscale score ranging from 0 to 21. The subsequent eight statements focus on the participants' knowledge of IPE, resulting in a possible subscale score ranging from 0 to 24. The remaining eight statements focus on the participants' attitudes toward IPE and, more specifically, their attitudes toward the four IPEC domains: values and ethics for interprofessional practice (two questions), roles and responsibility (two questions), interprofessional communication (two questions), and teams and teamwork (two questions), resulting in a possible subscale score ranging from 0 to 24.

Hinderer et al. (2016) indicated that a Delphi panel review validated the IPKAS statements' content before launching the survey. The Delphi panel review process involves gathering a group of experts on a subject and providing them with questions about specific content to receive feedback on how well the questions represent or validate the content (Colton & Hatcher, 2004). This process was necessary to ensure the reliability and validity of the IPKAS survey.

Post-data collection for the Hinderer et al. (2016) study reported a return of 71 of 116 surveys which yielded a 61.2% response rate. Internal consistency of the total survey was evaluated with an acceptable Cronbach's alpha of 0.82, but the authors did not report a

Cronbach's alpha for each of the three subscales. Internal consistency of the subscales would have been helpful to compare to the subscales of current study since some modifications were made for the purpose of the current study.

Modifications Made to the IPKAS Survey

Hinderer et al. (2016) granted the researcher permission to modify and use the IPKAS statements for the current study to create the Use of Interprofessional Education (IPE) in Radiography Education survey (see Appendix B). Minimal modifications were also made to four of the 23 statements from the IPKAS survey for the current study. Modifications included (see Appendix A):

1. The order of scores on the 4-point Likert scale was modified for the Use of Interprofessional Education (IPE) in Radiography Education survey to read from left to right, from strongly disagree (0) to strongly agree (3).
2. Question 23: The word "imminent" was changed to "present" to reflect the current interprofessional practice rather than the "imminent" practice from 2016.
3. Questions 31-33: The pronouns were changed from statements about individual actions to statements about perceptions of the profession.

The three subscales, number of questions, and possible subscale scores for the Use of Interprofessional Education (IPE) in Radiography Education survey remained consistent with those found in the IPKAS survey.

Delphi Panel Review of the Use of Interprofessional Education (IPE) in Radiography Education Survey

A Delphi panel review was conducted for content validation for the Use of Interprofessional Education (IPE) in Radiography Education survey. The expert panel selected to

review the survey consisted of seven healthcare education leaders representing various professions from a private college in the Midwest region of the United States. The Delphi panel members had all previously researched, planned, and executed interprofessional events and experiences for students from various healthcare education programs.

A Delphi panel review is a multi-session review process that continues until the expert panel deems the tool valid for use (Colton & Hatcher, 2004). The researcher provided the Delphi panel with the Use of Interprofessional Education (IPE) in Radiography Education survey via a Qualtrics link and paper form, detailed instructions explaining the purpose of the survey, and explanations of how the panel's feedback would help validate the survey. Based on the instructions, the panel members completed the survey as if they were part of the study via the Qualtrics link and then wrote on the paper copy of the survey to provide feedback. The Qualtrics software documented how long it took for panel members to complete the survey. The average time was (M = 7.71) minutes.

The Delphi panel members provided feedback on the questions, answer choices, type of questions used in the survey, flow, clarity, and appropriateness. Since the Use of Interprofessional Education (IPE) in Radiography Education survey utilized statements from the IPKAS tool that were already validated by a Delphi panel, feedback for revisions from the Delphi panel for the current study's instrument was minimal.

The Delphi panel members discussed Question 13 response choices on the survey tool. Question 13 assessed the self-reported level of use of IPE with response choices in the form of statements. The statements were treated as ordinal data and coded in rank order from 0-3 in Qualtrics. The panel discussed the four statements and agreed on the wording and rank order described in Table 1 to indicate radiography program directors' level of use of IPE in their

programs. The Delphi panel review process was completed with the approval of the Use of Interprofessional Education (IPE) in Radiography Education survey to be used as the data collection tool for the current study.

Table 1

Variables of IPE Level of Use

Variable	Program Director Level of Use of IPE	Definition of Levels of Use
PD_{NONU}	Not Offered, Not Used	There are no interprofessional education opportunities in my educational institution, and it is not incorporated into the program.
PD_{ONU}	Offered, Not Used	There are interprofessional education opportunities within my educational institution, but radiography students are not offered opportunities to participate.
PD_{OE}	Offered, Elective Use	There are interprofessional education opportunities within my educational institution and radiography students can elect to participate, but it is not incorporated into the program.
PD_{OM}	Offered, Mandated Use	All radiography students participate in interprofessional education opportunities because it is incorporated into the program.

Use of Interprofessional Education (IPE) in Radiography Education Survey

The Use of Interprofessional Education (IPE) in Radiography Education survey used for this study consisted of a total of 37 items, including one qualification question, six demographic questions, five focused questions addressing the study's dependent and independent variables, one question addressing the level of use of IPE, 23 statements from the modified IPKAS survey, and one open-ended question (see Appendix A).

The survey began with a qualification question to ensure the participants of the current study met the target sample population of current directors of JRCERT-accredited radiography programs. Questions 2, 3, and 4 addressed program demographic characteristics, including the type of institution sponsoring the program, the terminal award for the program, and the U.S. region where the program is located, respectively. Questions 5, 6, and 7 addressed respondent demographic characteristics, including years of experience as a director of a radiography program accredited by JRCERT, the year they became certified with the American Registry of Radiologic Technologists, and their age in years, respectively.

Questions 8 through 11 served as focused questions to address the research questions of the study. Question 8 was a dichotomous question regarding whether the radiography programs offered opportunities for IPE. Questions 9 through 11 included Likert-type questions concerning program directors' general attitudes, knowledge, and perceptions of IPE. Question 12 related to ethical leadership and decision making regarding IPE use. Question 13 concentrated on the program directors' self-reported level of use of IPE in their programs which addressed RQ1. Questions 14-36 of the survey were the modified statements from Hinderer et al.'s (2016) IPKAS survey which were divided into three subscales to address program directors' self-reported attitudes, knowledge, and perceptions of IPE.

The survey concluded with an open-ended question relating to general feedback from radiography program directors on their perceptions of challenges to implementing IPE; however, this study does not include qualitative data collected from the open-ended question and is intended for future use.

Procedures

The study was submitted and reviewed under the Bowling Green State University Institutional Review Board (IRB) criteria. Upon receiving IRB approval (see Appendix C), the study survey was uploaded to the Qualtrics platform. A survey link was created and emailed directly to the list of radiography program directors provided by JRCERT. The program directors who consented to participate completed the survey. The window to complete the survey was open for four weeks, with initial emails sent out at the beginning of week one, and reminder emails to complete the survey being sent out at the beginning of weeks three and four. Once the survey window closed at the end of week four, the data were exported from Qualtrics to IBM Statistical Package for Social Sciences (SPSS) software (Version 28.0) for data analysis.

Data Analysis

The independent variables in this study were program directors' attitudes, knowledge, and perceptions of IPE. The independent variables were addressed via the subscale statements from the IPKAS survey and were based on a 4-point Likert scale (0 = strongly disagree to 3 = strongly agree). The dependent variable was the level of use of IPE in radiography programs and it was considered categorical. Each statement regarding the level of IPE use was coded with a numeric value in rank order from 0 to 3 to describe the programs' level of use as demonstrated in Table 1. Both descriptive and inferential statistical analyses were conducted.

Demographic data are reported through descriptive statistics to better understand the sample included in this study. Frequencies and percentages were calculated for program demographic characteristics of the respondents' programs which included the type of institution sponsoring the program, the U.S. region where the program is located, and the program terminal

award granted. The terminal award granted to graduates of radiography programs is either a certificate, an associate degree, or a bachelor's degree.

Central tendency (mean, median, mode) and measures of variability (standard deviation and range) were calculated for the respondents' years of experience as a director of a radiography program accredited by JRCERT, the year the respondents became ARRT certified in radiography, and the age of the respondents in years.

A chi-square goodness of fit test was performed to establish if the professional demographic characteristics of the respondents were significantly different than the population of JRCERT-accredited radiography program directors. Responses to questions regarding the type of institution sponsoring the radiography program, geographic region, and the terminal award offered were compared to published data in the 2022 JRCERT Organizational Report for accredited radiography programs in the United States (JRCERT, 2022). A significance level of $\alpha = 0.05$ was chosen.

Descriptive statistics, frequencies, and percentages were evaluated for the focused questions relating to whether the directors' offered opportunities for IPE in their programs, their general attitudes, knowledge, and perceptions of IPE, and decision making regarding educational experiences and innovative delivery methods.

Research Question 1 was evaluated using frequencies and percentages. This analysis provided insight into how IPE is used in JRCERT-accredited radiography programs. Research Question 2 was designed to focus on each independent variable, program directors' attitudes (RQ2a), knowledge (RQ2b), and perceptions (RQ2c) of IPE, and if there is an association between the independent variables and the dependent variable, or the level of use of IPE in the directors' programs.

Spearman's Rho correlation coefficient was the inferential statistical test utilized to establish a positive or negative association between the independent and dependent variables and, if so, to measure the strength of the association (Dancy & Reidy, 2004). The correlation coefficient ranges from -1 to 1, with zero representing no correlation between variables. The closer the correlation coefficient is to -1 or 1, the stronger the correlation (Schober et al., 2018).

Spearman's Rho is a statistical test used on nonparametric data. Spearman's Rho measures the association between two variables and the direction of the association, whether it be positive or negative. There are two conditions which must be met when using Spearman's Rho. The first condition requires both variables to have ordinal data, meaning that the order of the data matters (Schober et al., 2018). With this condition, Spearman's Rho is a supported statistical method to evaluate Likert-type data. Likert-type data are ranked in a defined order, such as on a scale of 1-5 (Lee et al., 2018). The second condition is there needs to be a monotonic relationship between the two variables, meaning that as one of the variables changes, the other variable changes as well; however, the direction of the change does not have to be in the same direction or at a constant rate (Schober et al., 2018).

Spearman's Rho assesses the strength and direction of an association between variables. Puspitasari et al. (2020) reported a monotonic relationship between the variables of attitudes, knowledge, and perception using Spearman's Rho. Based on the two conditions previously mentioned and the use of Spearman's Rho for nonparametric data, Spearman's Rho is the statistical test appropriate for the present study to evaluate the attitudes, knowledge, and perceptions of radiography program directors toward IPE and if these variables are associated with the level of use of IPE in radiography programs.

For this study, Spearman's Rho correlation coefficient was utilized for RQ2a, RQ2b, and RQ2c to examine the three subscales, attitudes, knowledge, and perceptions, respectively, and the level of use of IPE in radiography programs.

Below are the research questions with the corresponding null and alternative hypotheses:

RQ1. What is the level of use of IPE in radiography programs?

The null and alternative hypothesis for RQ1 was:

H0: PDOM = PDOE = PDONU = PDNONU

H1: PDOM ≠ PDOE ≠ PDONU ≠ PDNONU

RQ2a. Are program directors' self-reported attitudes toward IPE associated with the level of use of IPE?

The null and alternative hypotheses for RQ2a were:

H0: Level of use of IPE is not associated with PD attitudes toward IPE.

H1: Level of use of IPE is associated with PD attitudes toward IPE.

RQ2b. Is program directors' self-reported knowledge of IPE associated with the level of use of IPE?

The null and alternative hypotheses for RQ2b were:

H0: Level of use of IPE is not associated with PD knowledge of IPE.

H1: Level of use of IPE is associated with PD knowledge of IPE.

RQ2c. Are program directors' self-reported perceptions of IPE associated with the level of use of IPE?

The null and alternative hypotheses for RQ2c were:

H0: Level of use of IPE is not associated with PD perceptions of IPE.

H1: Level of use of IPE is associated with PD perceptions of IPE.

Reliability and Validity of Survey

Internal consistency was evaluated to confirm the appropriateness of using the Use of Interprofessional Education (IPE) in Radiography Education survey to collect participants' data. The reliability coefficients for both the overall scale and subscales were calculated. The Cronbach's alpha for the overall scale was .89, supporting the validity of the survey. The Cronbach's alpha for the groups of subscales of attitudes, knowledge, and perceptions were .78, .80, and .78, respectively. All values were greater than .70, indicating acceptable internal consistency of the overall survey and each subscale group (Gliem & Gliem, 2003).

Summary

Chapter 3 presented a research design that explored the attitudes, knowledge, and perceptions of JRCERT-accredited radiography program directors toward IPE to examine their decision to use or not to use IPE in their programs. A cross-sectional, descriptive survey research design was used to understand whether the self-reported attitudes, knowledge, and perceptions of IPE were associated with directors' use of IPE in their programs. This chapter addressed the research design, specifics about the respondents and their radiography programs, the research questions examined, and the instrumentation and procedures used to collect and analyze the data. Chapter 4 will provide the research analysis results relative to the research questions used in this study.

CHAPTER IV. RESULTS

The data for the current study were collected using the Use of Interprofessional Education (IPE) in Radiography Education survey via Qualtrics. The survey included focused questions inquiring about the attitudes, knowledge, and perceptions of radiography program directors regarding IPE, and a deep investigation of these perspectives was accomplished by utilizing a modified IPKAS survey (Hinderer et al., 2016). Chapter 4 reports the survey response rate, sample demographics, and external validity, as well as the reliability and descriptive and inferential statistical results of the survey.

Survey Response Rate

Of the 604 directors of JRCERT-accredited radiography programs whom the Qualtrics-based survey was emailed to, 288 surveys were returned, resulting in a response rate of 47.4%. Surveys were deemed unusable if there were missing data from the modified IPKAS statements which made up the attitudes, knowledge, and perceptions subscales used to answer RQ2. A total of 26 surveys were removed from the study with a corrected response rate of 43.1% ($N = 262$).

Sample Demographics

The means and measures of variability (standard deviation and range) were calculated for the respondents' years of experience as a director of a radiography program accredited by JRCERT, the year the respondents became ARRT certified in radiography, and the ages of the respondents in years.

The mean of the years of experience as a director of a radiography program accredited by JRCERT was 8.4 years ($n = 262$; $SD = 8.14$), with a range of 43 years (range = 1-44). The mean year the respondents became ARRT certified in radiography was 1996 ($n = 262$; $SD = 10.73$), with a range of 46 years (range = 1970-2016). The mean age in years for all respondents was

50.5 years (n = 252; SD = 9.48), with a range of 42 years (range = 28-70).

Comparison of Sample Program Demographics to JRCERT's 2022 Organizational Report

To determine if the respondents were representative of the JRCERT-accredited radiography program director population, program demographic characteristic data were collected regarding the type of sponsoring institution, the terminal award granted, and the geographic region and compared to the respective data documented in JRCERT's 2022 Organizational Report on the "About Us" webpage. A significance level of $\alpha = 0.05$ was chosen.

A chi-square goodness of fit test was conducted to determine whether the respondents' type of sponsoring institution frequency distribution differed significantly from the type of sponsoring institutions representative of radiography programs reported by JRCERT. The results of the chi-square goodness of fit test were not statistically significant, χ^2 (4, n = 262) = 6.971, p < .137, which suggests that there is no significant difference between the type of sponsoring institution representative of the sample of respondents in the current study and the type of sponsoring institution representative of the population of JRCERT-accredited radiography programs.

A chi-square goodness of fit test was conducted to determine whether the respondents' program terminal award granted frequency distribution differed significantly from the terminal award granted representative of radiography programs as reported by JRCERT in the 2022 Organizational Report. The results of the chi-square goodness of fit test were not statistically significant, χ^2 (2, N = 262) = 4.389, p < .111, which suggests that there is no significant difference between the program terminal award granted representative of the sample of respondents in the current study and the terminal award granted representative of the population of JRCERT-accredited radiography programs.

A chi-square goodness of fit test was conducted to determine whether the frequency distribution of the respondents' geographic location differed significantly from the geographic location representative of radiography programs reported by JRCERT. The results of the chi-square goodness of fit test were not statistically significant, χ^2 (8, N = 261) = 3.490, p < .900, which suggests that there is no significant difference between the program geographic location representative of the sample of respondents in the current study and the geographic location representative of the population of JRCERT-accredited radiography programs (see Table 2).

Table 2

Program Demographic Characteristics of Respondents Versus the JRCERT Population

Professional Characteristics	Statistical Value	Degree of Freedom	*p* Value	Sample *n*	Sample *%*	JRCERT *N*	JRCERT *%*
Type of sponsoring institution	6.971	4	.137	262		605	
Four-year college/university				60	22.9	133	21.9
Community college				114	43.5	266	43.9
Technical college/institute				38	14.5	64	10.5
Hospital/medical center				42	16	105	17.4
Military/government				0	0	1	0
Proprietary				8	3.1	34	5.8
Consortium				0	0	2	0
Terminal award granted	4.389	2	.111	262		605	
Certificate				43	16.4	106	18
Associate				189	71.1	448	74

Professional Characteristics	Statistical Value	Degree of Freedom	*p* Value	Sample *n*	Sample %	JRCERT *N*	JRCERT %
Bachelor				30	11.5	51	8
Program location/U.S. regions	3.490	8	.900	261		605	
New England				15	5.7	28	5.0
Mid-Atlantic				29	11.1	71	12
East North Central				49	18.7	112	19
West North Central				26	9.9	60	10.
South Atlantic				61	23.3	143	24
East South Central				18	6.9	50	11
West South Central				32	12.2	66	11
Mountain				17	6.5	33	5
Pacific				14	5.3	42	7

Reliability of the Survey

The entire Use of Interprofessional Education (IPE) in Radiography Education survey, as well as each group of subscale questions, were assessed for internal consistency using Cronbach's alpha. The Cronbach's alpha for the entire survey was .89, supporting the reliability of the survey. The Cronbach's alpha for the groups of subscales of attitudes, knowledge, and perceptions were .78, .80, and .78, respectively. All values were greater than .70, indicating acceptable internal consistency of the survey and the subscale groups (Gliem & Gliem, 2003).

Descriptive Statistics

Program directors' use of IPE in their radiography programs and their attitudes, knowledge, perceptions of IPE were evaluated twice in the Use of Interprofessional Education (IPE) in Radiography Education survey created for this study. The focused questions of the survey were represented by Questions 8 through 12, respectively. Question 13 consisted of the respondents' self-reported level of use of IPE in their programs, and Questions 14-36 of the survey were the modified statements from the Hinderer et al. (2016) IPKAS survey. The modified IPKAS statements were divided into three subscales by Hinderer et al. to address program directors' self-reported attitudes, knowledge, and perceptions of IPE. Questions 13-36 delved deeper into the respondents' use of IPE and their attitudes, knowledge, and perceptions of IPE.

Focused Questions

The focused questions were created as straightforward questions to evaluate the respondents' use of IPE in their programs and their attitudes, knowledge, and perceptions of IPE. Question 12 was also a focused question which aimed to evaluate the respondents' decision making regarding educational experiences and innovative delivery methods. The development of the focused questions, survey Questions 8-12, was inspired by the research literature discovered and examined during this study.

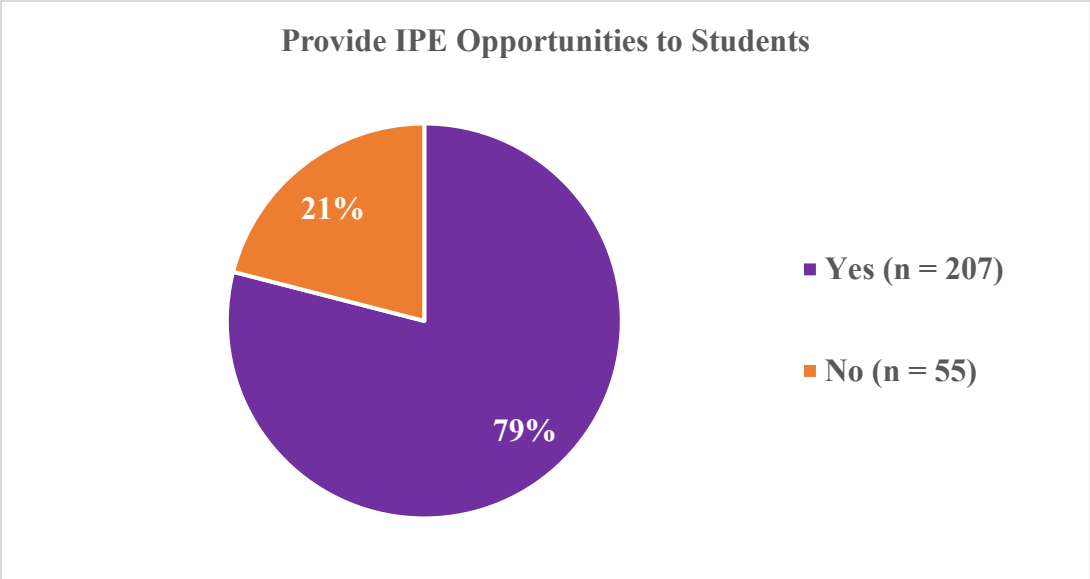
Descriptive statistics, frequencies, and percentages were calculated for the focused questions related to whether radiography programs offered opportunities for IPE, program directors' general attitudes, knowledge, and perceptions of IPE, and decision making related to the use of IPE.

Survey Question 8 is a focused question designed to evaluate if program directors

provide IPE opportunities to their students. A total of 262 respondents answered Question 8 on the survey, and 79% (*n* = 207) responded yes to providing IPE opportunities to their students and 21% (*n* = 55) responded no (see Figure 1).

Figure 1

Program Provides IPE Opportunities to Students



Survey Questions 9 through 11 are focused questions created to evaluate program directors' knowledge, attitudes, and perceptions of IPE, respectively. A total of 261 respondents answered Question 9 of the survey; 43% (*n* = 113) strongly agreed and 49% (*n* = 129) agreed with being aware that IPE is a teaching method for promoting student learning, communication, and teamwork. A total of 261 respondents answered Question 10 of the survey; 47% (*n* = 125) strongly agreed and 50% (*n* = 131) agreed that IPE is beneficial for increasing student learning, communication, and teamwork. A total of 260 respondents answered Question 11 of the survey; 54% (*n* = 142) strongly agreed and 40% (*n* = 106) agreed that IPE is important for preparing students for their professional experiences working with other healthcare professionals (see Table 3).

Finally, survey Question 12 is a focused question designed to evaluate program directors' decision making regarding the use of IPE in their programs. A total of 260 respondents answered Question 12 of the survey; 36% (n = 94) strongly agreed and 55% (n = 144) agreed that providing IPE experiences to their students is the appropriate choice, even though IPE is not currently required by JRCERT (see Table 3).

Table 3

Focused Questions Regarding IPE

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	*n*
Q9. Knowledge of IPE	4 (1.5%)	15 (5.7%)	129 (49.2%)	113 (43.1%)	261
Q10. Attitudes toward IPE	2 (0.8%)	4 (1.5%)	131 (50%)	125 (47.7%)	262
Q11. Perceptions of IPE	2 (0.8%)	10 (3.8%)	106 (40.5%)	142 (54.2%)	260
Q12. Decision making regarding use of IPE	3 (1.1%)	19 (7.3%)	144 (55.0%)	94 (35.9%)	260

Research Question 1

The first research question addressed the level of use of IPE by program directors in their radiography programs and was answered by testing the null hypothesis. Respondents had one of four levels to choose from to describe their program's level of use of IPE (see Table 1).

Research Question 1

What is the level of use of IPE in radiography programs?

The null and alternative hypotheses for RQ1 were:

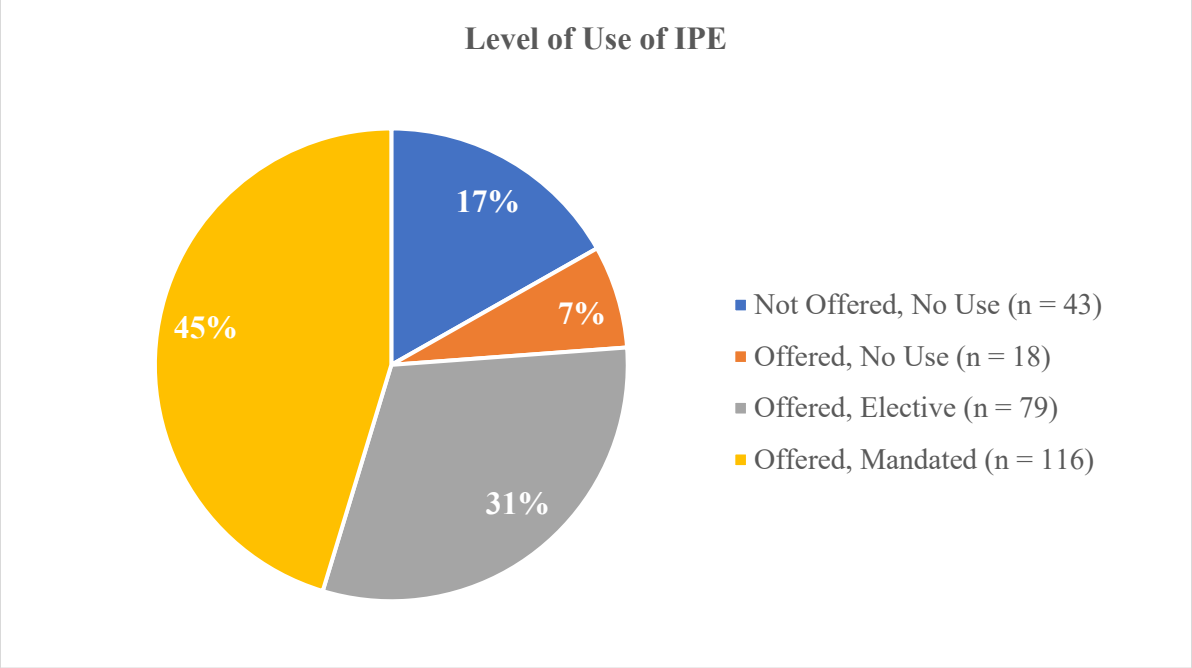
H0: PDOM = PDOE = PDONU = PDNONU

H1: PDOM ≠ PDOE ≠ PDONU ≠ PDNONU

A total of 256 program directors self-reported their level of use of IPE in their program as not offered, no use (n = 43, 16.7%); offered, no use (n = 18, 7.0%); offered, elective (n = 79, 30.8%); and offered, mandated (n = 116, 45.3%) (see Figure 2). The results suggest all levels of use of IPE in radiography programs accredited by JRCERT are not equal. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

Figure 2

Level of Use of IPE in Radiography Programs



Research Question 2

The second research question was comprised of three parts (RQ2a, RQ2b, RQ2c) which focused on program directors' attitudes, knowledge, and perceptions of IPE respectively and if these factors were associated with the level of use of IPE in their programs. RQ2 was evaluated using descriptive and inferential statistics for each of the modified IPKAS subscales (Hinderer et al., 2016).

Research Question 2a

Are program directors' self-reported attitudes toward IPE associated with the level of use of IPE?

The null and alternative hypotheses of RQ2a were:

H0: Level of use of IPE is not associated with PD attitudes of IPE.

H1: Level of use of IPE is associated with PD attitudes toward IPE.

Descriptive statistics were collected for the deeper investigation of program directors' attitudes toward IPE through the modified IPKAS subscale. The mean subscale score for attitudes toward IPE was 16.96, (SD ± 3.06), and scores ranged from 5-24.

RQ2a was addressed using Spearman's Rho correlation coefficient to analyze the strength of the association between the attitudes subscale scores from each participant and their indicated level of use of IPE in their programs.

Program directors' *(*N = 262) attitudes toward IPE (M = 16.9, SD ± 3.06) indicated a statistically significant, weak, positive association with the level of use of IPE (M = 2.05, SD ± 1.09) in their programs (r_s = .200, p = .001). The results suggest that program directors' level of use of IPE is associated with their attitudes toward IPE. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

The RQ2a findings were further supported by analyzing Question 10 of the survey for an association with the level of use of IPE. Question 10 of the survey was a focused question that evaluated program directors' attitudes toward the benefits of IPE on their students' learning, communication, and teamwork. Program directors' attitudes toward IPE also revealed a statistically significant, weak, positive association with the level of use of IPE in their programs ($r_s = .280$, $p = < .001$).

Research Question 2b

Is program directors' self-reported knowledge of IPE associated with the level of use of IPE?

The null and alternative hypotheses of RQ2b were:

H0: Level of use of IPE is not associated with PD knowledge of IPE.

H1: Level of use of IPE is associated with PD knowledge of IPE.

Descriptive statistics were collected for the deeper investigation of program directors' knowledge of IPE through the modified IPKAS subscale. The mean subscale score for knowledge of IPE was 16.52, ($SD \pm 3.33$), and scores ranged from 5-24.

RQ2b was addressed using Spearman's Rho correlation coefficient to analyze the strength of the association between the knowledge subscale scores from each participant and their indicated level of use of IPE in their programs.

Program directors' ($N = 262$) knowledge of IPE ($M = 16.5$, $SD \pm 3.33$) indicated a statistically significant, strong, positive association with the level of use of IPE ($M = 2.05$, $SD \pm 1.09$) in their programs ($r_s = .440$, $p = < .001$). The results suggest that program directors' level of use of IPE is associated with their knowledge of IPE. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

The RQ2b findings were further supported by analyzing Question 9 of the survey for an association with the level of use of IPE. Question 9 of the survey was a focused question that evaluated program directors' general knowledge of IPE as a teaching method for promoting student learning, communication, and teamwork. Similarly, program directors' general knowledge of IPE revealed a statistically significant, moderate, positive association with the level of use of IPE in their programs ($r_s = .313$, $p = < .001$).

Research Question 2c

Are program directors' self-reported perceptions of IPE associated with the level of use of IPE?

The null and alternative hypotheses of RQ2c were:

H0: Level of use of IPE is not associated with PD perceptions of IPE.

H1: Level of use of IPE is associated with PD perceptions of IPE.

Descriptive statistics were collected for the deeper investigation of program directors' perceptions of IPE through the modified IPKAS subscale. The mean subscale score for perceptions of IPE was 13.71, ($SD \pm 2.77$), and scores ranged from 6-21.

RQ2c was addressed using Spearman's Rho correlation coefficient to analyze the strength of the association between the perceptions subscale scores from each participant and their indicated level of use of IPE in their programs.

Program directors' *(*$N = 262$) perception of IPE ($M = 13.7$, $SD \pm 2.77$) indicated a statistically significant, weak, positive association with their level of use of IPE ($M = 2.05$, $SD \pm 1.09$) in their programs ($r_s = 0.229$, $p = < .001$). The results suggest that program directors' level of use of IPE is associated with their perceptions of IPE. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

The RQ2c findings were further supported by analyzing Question 11 of the survey for an association with the level of use of IPE. Question 11 of the survey was a focused question that evaluated program directors' general perceptions of the importance of preparing students for their professional experiences working with other healthcare professions. Similarly, program directors' general perceptions revealed a statistically significant, moderate, positive association with the level of use of IPE in their programs ($r_s = .319$, $p = < .001$).

Summary

Chapter 4 presented the results of survey response rates, sample demographics, and external validity, as well as reliability and the descriptive and inferential statistical results of the data.

Statistical analyses and hypothesis testing for the research questions were presented for this study. Research Question 1 findings were reported using descriptive statistical results of the data. Research Question 2 findings were reported using descriptive and inferential statistical results of the data.

Chapter 5 will provide a summary of the analysis and a discussion of the results of each research question. Conclusions, recommendations for future research, limitations, and implications for leadership and practice will also be discussed in Chapter 5.

CHAPTER V. DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Healthcare professionals are expected to provide quality, team-based, patient-centered care to their patients, giving patients a more cohesive care experience. Providing cohesive, patient-centered care requires education and training to be introduced to professionals at the foundational level of healthcare education programs. Interprofessional education has been found to be a valuable resource to assist in achieving more cohesive, team-based, patient-centered care. Many healthcare education accreditors have mandated IPE to be included in program curricula; however, not all healthcare education accreditors require IPE for their respective discipline.

Radiography programs accredited by the Joint Review Committee on Education in Radiologic Technology are not mandated to include IPE in their program curricula; however, JRCERT does encourage IPE as an innovative approach to providing students with flexible and creative learning opportunities. Healthcare education program directors oversee what is taught in their curriculum and thus the implementation of an experience such as IPE is determined by them. The purpose of this non-experimental, quantitative design study was to better understand radiography program directors' attitudes, knowledge, and perceptions of IPE and how these factors affect the level of use of IPE in radiography programs accredited by JRCERT.

Data for this study were collected utilizing the Use of Interprofessional Education (IPE) in Radiography Education survey. The survey tool assessed the program directors' self-reported attitudes, knowledge, and perceptions of IPE using Likert-type questions. Program directors were also assessed on their self-reported level of use of IPE in their programs. The survey responses were used to determine if program directors' attitudes, knowledge, and perceptions were associated with the level of use of IPE in their programs. Chapter 5 provides a review of the study, findings, and recommendations for future research and practice.

Statement of the Problem, Purpose, and Methodology

The traditional patient care process, prior to patient-centered care, involved the patient being passed from one healthcare professional to the next with limited communication among the healthcare team about the care being provided and limited input from the patient about the care they received (Longtin et al., 2010). The traditional patient care process created problems for the patient, such as miscommunication between caregivers about the care of the patient, which resulted in segmented care and medical errors (Boardman, 2017).

As the need for team-based, patient-centered care was acknowledged, healthcare education programs recognized the need for preparing healthcare students to be members of the healthcare team. This resulted in over 20 healthcare profession associations and education accreditors including the use of IPE as a teaching method within their programmatic standards (HPAC, 2019). IPE provides the environment to enhance patient care and team-based skills of the student before entering the workforce. With this enhancement of collaborative care, IPE provides the necessary education to decrease medical error through addressing communication issues among healthcare professionals and promoting team building (TJC, 2015; Wagner et al., 2017).

Advocating for IPE in healthcare education is based on its positive influence on student learning, student interactions with peers, and patient care outcomes (Reeves et al., 2013). However, when IPE is not required by leaders of a profession, programmatic accreditors, or institutional leaders, challenges can prevent program directors from providing IPE to students. Documented challenges include alignment of curriculum across disciplines, lack of leadership dedicated to the coordination of IPE programming, and a lack of resources, including funding, to

support the integration of a new teaching strategy (Clark, 2018; Sunguya et al., 2014; Teodorczuk et al., 2016; Wong et al., 2019).

Personal considerations of program directors regarding a new teaching strategy, such as IPE, could also impact their decision to utilize the teaching strategy in their curricula. Personal considerations include educational leaders' attitudes, knowledge, and perceptions of IPE (Hinderer et al., 2016). Although there is literature on the attitudes, knowledge, and perceptions of IPE from students, professionals, and faculty members, there is a lack of research on how these personal considerations influence program directors' choice to implement IPE into their curricula. One reason for this could be that many healthcare education programs are required by their respective accrediting bodies to implement IPE into their programs; however, not all healthcare education programs are required to implement IPE (Steketee & O'Keefe, 2020). Thus, the decision to implement IPE into a curriculum is left to the educational leader's ethical, practical, and personal considerations on the subject.

For this study, ethical considerations were viewed through the lens of ethical leadership which included the integration of Starratt's (1991) ethics of critique, care, and justice, known collectively as the ethic of profession (Shapiro & Stefkovich, 2005). Practical considerations involved the challenges that surround the use of IPE, including difficulties with curricula, leadership, resources, stereotypes, student diversity, IPE concepts, teaching, enthusiasm, professional jargons, and accreditation standards (Sunguya et al., 2014). Personal considerations included educational leaders' attitudes, knowledge, and perceptions of IPE (Hinderer et al., 2016).

The current research provides insight into program directors' personal considerations of IPE and how these considerations influence directors' self-reported level of use of IPE in their programs.

Summary and Discussion of Results

The following section includes a summary of the current study's findings as they pertain to the study's research questions. Each research question is summarized and organized by the study's findings, explanations for the findings, and how the findings are related to the literature.

Research Question 1

Research Question 1 asked, "What is the level of use of IPE in radiography programs?" The results of this study revealed levels of use of IPE in radiography programs accredited by JRCERT are not the same across all programs. The results disclosed that 45% of the sample of program directors reported that all radiography students in their program participated in IPE as part of their program. It was also discovered that 31% of the sample of program directors reported that their educational institution offered IPE opportunities with other healthcare programs in the institution but participation for the radiography students was optional. Likewise, 7% of the sample of program directors disclosed that their educational institution offered IPE opportunities with other programs in the institution, however, their radiography students were not offered an opportunity to participate. The final 17% of the sample of program directors divulged that there were no IPE opportunities at their educational institution and IPE was not incorporated in the radiography program.

JRCERT does not mandate that all their accredited programs use IPE in their curriculum as part of the 2021 accreditation standards. However, JRCERT does state in Standard 4.2 that "All programs must follow a JRCERT-adopted curriculum" which they define as the most recent

American Society of Radiologic Technologists curriculum for radiography programs (JRCERT, 2021, p. 28). JRCERT also encourages "innovative approaches to curriculum delivery methods that provide students with flexible and creative teaching opportunities" and include interprofessional development as an optional method (JRCERT, 2021, p. 28). Since the ASRT does not include IPE in their most recent adopted 2017 curriculum and JRCERT encourages interprofessional development as an optional method of curriculum delivery in Standard 4.2, the use of IPE in radiography programs is left to the discretion of the program director (ASRT, 2017; JRCERT, 2021).

Reflecting on the practical, ethical, and personal considerations of a program director's choice to use IPE in their program, questions may be raised as to why a director would not use IPE in their program. Based on the current study's data, only 45% of the sample of radiography programs accredited by JRCERT expose their students to IPE as part of learning in their program. This indicates that the other 55% of the sample of programs either leave it up to their students to elect to participate in IPE (31%), or students are not exposed to IPE at all (24%). Considering the practical use of IPE, the evidenced benefits for stakeholders of radiography programs and the documented approaches to overcome challenges associated with implementing IPE into a curriculum suggest its use is both feasible and overwhelmingly positive.

The positive impact of IPE on students' learning includes increased confidence and understanding of their future roles as professionals on the healthcare team, higher self-efficacy after participating in IPE activities, recognizing shared values across disciplines, increased respect for their peers, and students were more confident sharing their knowledge of their profession with their peers (Boardman, 2017; Dyess et al., 2019; Guraya & Barr, 2017; Mouser et al., 2017; Sunguya et al., 2014; Teodorczuk et al., 2016; Wong et al., 2019).

The literature examined in the current study reported the challenges surrounding the implementation and use of IPE, including a heavy, discipline-specific curriculum load, a lack of leadership and resource guidance, stereotypes and the diversity in student learning among programs, confusion over IPE concepts and how to teach the concepts, a lack of enthusiasm for IPE from both students and faculty, professional jargons, and diversity between professions' accreditation standards (Sunguya et al., 2014). However, the literature also serves as a resource on how to address the challenges related to implementing IPE into healthcare curricula (Boardman, 2017; Brashers et al., 2012; Lash et al., 2014; Paige et al., 2014; Steketee & O'Keefe, 2020; Wynarczuk et al., 2019).

Considering the ethical implications of using IPE, applying a lens of ethical leadership to examine program directors' decision not to use IPE in their radiography programs opposes Shapiro and Stefkovich's (2005) ethic of profession. The ethic of profession is the integration of Starratt's (1991) ethics of critique, care, and justice. The ethics of critique, care, and justice can be utilized individually as an ethical approach; however, all three theories must be examined together when considering an ethical approach to professional decision making. This is because ethical decision making for a profession must consider individuals and/or groups of stakeholders affected by the decision, such as patients, students of the profession, other allied professions, healthcare institutions, and communities.

The ethic of critique involves leaders who critique a process by deconstructing the process and evaluating it based on the rules and standards that govern it as opposed to one's own self-interests. The ASRT is a national society of medical imaging and radiation therapy professionals whose mission is to "advance and elevate the medical and radiation profession and to enhance the quality and safety of patient care" (ASRT, 2022). The ASRT provides

radiography educators with a curriculum to incorporate into their teachings which outlines the knowledge deemed “essential for entry-level radiographers” (ASRT, 2017, p. i). Although the ASRT does not include IPE in their 2017 radiography curriculum, the society provides resources to their members which include current evidence-based practices and essential knowledge for entry-level radiography professionals (ASRT, 2022). Not considering all resources governing the profession would be a breach of the ethic of critique, and therefore it is essential program directors consider this information as they develop their curricula and consider implementing IPE.

The ethic of care includes the consideration of all stakeholders when making decisions and not just what benefits the decision maker (Starratt, 1991). From the perspective of the ethic of care, IPE leads to positive experiences and outcomes for multiple stakeholders in the process, including preparing students for their profession and providing patients with better quality care (Marcussen et al., 2020). Not providing students the opportunity to participate in IPE experiences that would improve their learning and enhance the quality of their patient-centered care skills would be a breach of the ethic of care.

From the perspective of the ethic of justice, ethical decision making helps to keep the scope of decision making clear, keeps educational leaders accountable for why certain decisions are made, and focuses on the greatest good for the greatest number of people (Botes, 2000; Juujarvi et al., 2019; Starratt, 1991). In context to the decision of implementing IPE for the purpose of using an effective teaching strategy, IPE has been recognized to have a positive impact for all stakeholders involved and is an evidence-based practice used around the world to teach healthcare students how to provide safe, quality, patient-centered care (Thomas et al., 2017).

Since the ethics of critique, care, and justice provide the foundation for the ethic of profession, an ethical lens of the profession should be applied to the decision-making process when making decisions that can impact a profession. Using an ethical lens provides transparency and accountability for decisions that consider key stakeholders affected by the decision.

The practical and ethical considerations surrounding the use of IPE in radiography programs accredited by JRCERT provide enough valid information for program directors to make an informed, evidence-based decision to provide their students the opportunity to participate in IPE experiences during their radiography education. However, when the decision to use IPE in program curricula is optional, program directors are likely to also be influenced by their personal considerations and, depending on their attitudes, knowledge, and perceptions of IPE, they may choose not to provide their students with IPE experiences.

Based on the current study's data, 45% of the sample of radiography programs accredited by JRCERT exposed their students to IPE experiences as part of learning in their program. This indicates that 45% of the sample of program directors may have considered the practical and ethical reasons for providing IPE to their students.

The current study data also revealed the absence of ethical considerations on the part of program directors. This was reflected in the finding that 31% of the sample of radiography programs whose educational institution provided IPE experiences made IPE an elective for radiography students, meaning participation in IPE was up to each student to decide for themselves. Likewise, 17% of the sample of radiography programs whose educational institution provided IPE experiences did not give radiography students the opportunity to participate. Lastly, 7% of the sample of radiography programs revealed their institution did not offer IPE experiences and therefore IPE was not offered in their radiography program. When considering

program directors' choice to use IPE in their curricula for practical reasons, the benefits of IPE for stakeholders of radiography programs are overwhelmingly positive. However, despite the advantages, numerous challenges arise when integrating IPE into a curriculum. Fortunately, research offers solutions to address and overcome those challenges. For the 55% of the sample of program directors who did not consider the ethical and practical reasons for their choice to use or not to use IPE in their program curriculum, then there may be personal considerations they more strongly accounted for when making their choice.

The final factor that impacts JRCERT-accredited radiography program directors' choice regarding IPE use in their curricula is personal considerations. Personal considerations may provide a defense that influences directors to choose not to use IPE in their programs. This is most prominently seen when program directors' attitudes, knowledge, and perceptions of IPE as an innovative teaching method do not align with the current literature. Consequently, the data used to answer the second research question in the current study provides self-reported evidence of program directors' attitudes, knowledge, and perceptions of IPE and the program directors' reported level of use of IPE in their programs to further investigate this issue.

Research Question 2

Research Question 2 was split into three parts, 2a, 2b, and 2c, which asked, "Are program directors' self-reported attitudes toward IPE associated with the level of use of IPE? Is program directors' self-reported knowledge of IPE associated with the level of use of IPE? Are program directors' self-reported perceptions of IPE associated with the level of use of IPE?", respectively.

When considering the second research question of this study, program directors' personal considerations were examined, including their attitudes, knowledge, and perceptions of IPE, and the data revealed that directors' personal considerations were positively associated with their

decision-making processes regarding IPE use in their radiography programs. A positive association between two variables indicates that when one variable increases or decreases, the other variable increases or decreases, respectively. In the current study, program directors who self-reported positive attitudes toward, increased knowledge of, and a positive perception of IPE were more likely to make the decision to use IPE in their programs. By contrast, program directors who self-reported negative attitudes toward, decreased knowledge of, and a negative perception of IPE were less likely to make the decision to use IPE in their programs.

The findings of research Questions 2a, 2b, and 2c of the current study align with other studies that suggest attitudes, knowledge, and perceptions of IPE have an impact on leaders' decision-making processes (Boardman, 2017; Hinderer et al., 2016).

Attitudes and Decision Making. In the current study, research Question 2a investigated the relationship between program directors' self-reported attitudes toward IPE and the level of use of IPE in their radiography programs. The results of RQ2a suggest that there is a positive association between attitudes and the decision to use or implement IPE. A positive association indicates that when one variable increases, the other variable increases. The attitudes relating to IPE implementation in the current study refer to the participants' self-reported views toward the four core competency domains of IPE outlined by IPEC, including values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork (Hinderer et al., 2016; IPEC, 2023).

Attitudes are opinions and evaluations related to specific topics stored in one's memory. Attitudes can manifest from a stored feeling, opinion, or evaluation of a person, place, situation, routine, or event. (Sanbonmatsu et al., 2014; Verplanken & Orbell, 2022). Attitudes determine choice when choice options are evaluated. Positive or negative attitudes can influence a choice

favorably or unfavorably, respectively, depending on the evaluation of the choice option stored in one's memory.

Schelling and Rubenstein (2021) assert that within the theory of planned behavior, attitudes encompass both instrumental attitudes and experiential attitudes. Instrumental attitudes result from a more cognitive appraisal of a topic, such as thoughts of usefulness and significance. Experiential attitudes result from a more affective appraisal of a topic, such as feelings toward the topic based on past experiences.

In the current study, program directors' attitudes were quantified by calculating a total subscale score from the survey questions that addressed values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork pertaining to interprofessional practice (IPP). A positive association between attitudes toward IPE and the decision to use IPE suggests that if program directors had positive thoughts of usefulness, significance, and feelings toward values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork, then they made the decision to offer IPE to their students. However, if program directors had negative thoughts of usefulness, significance, and feelings towards values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork, then they made the decision not to offer IPE to their students. The sample of program directors' attitudes toward IPE should be based on their cognitive appraisal of the IPE domains as well as their past experiences in clinical practice and working with other professions.

The results of RQ2a indicate that 76% of the respondents agreed or strongly agreed with the survey questions that pertained to the total subscale score for program directors' attitudes. The data revealed that program directors with increased attitude scores corresponded with the

program directors who offered IPE experiences to their students either as a mandated experience that was part of their program curriculum or as an elective experience for students who wished to participate. These findings are supported by prior research studies that assert the more positive a leader's attitude is toward a certain practice, the more likely they are to implement that practice (Afroz & Ilham, 2020; Farahnak et al., 2020; Sanbonmatsu et al., 2014).

At the time of data collection for the current study, IPE was not mandated for radiography programs accredited by JRCERT to be included in the curricula. Considering 76% of the program directors from the current study offered IPE experiences to their students and had increased or positive attitude scores toward IPE without its use being mandated by JRCERT, it is likely ethical or practical reasons influenced their attitudes and their decision to use IPE in their programs. Likewise, the other 24% of the program directors from the current study who had decreased attitude scores and did not offer IPE experiences to their students may have had personal reasons for their decision not to include IPE in their curricula.

As previously discussed, attitudes can manifest from feelings, opinions, and evaluations of experiences in either a positive or negative manner. Attitudes can also be influenced by factors such as leaders, peers, and routines (Sanbonmatsu et al., 2014; Verplanken & Orbell, 2022). Leaders, peers, and routines may have influenced radiography program directors' attitudes toward the decision to use IPE, either favorably or unfavorably.

Leaders' Influence on Attitude. Leaders can influence the attitudes of the people who follow them by developing a trusting and professional relationship with their followers (Kouzes & Posner, 2012). When a leader creates a climate of trust for their team, attitudes of the team members can be used as a predictor of how the team will accept a certain practice (Afroz & Ilham, 2020; Lash et al., 2014; Walk, 2023).

When a leader wants their team to react favorably toward a new, innovative practice, the leader can demonstrate an attitude of acceptance for the practice (Boardman, 2017; Kouzes & Posner, 2012; Lash et al., 2014) and communicate the benefits for stakeholders that the innovative practice provides (Walk, 2023). Leaders can also express an understanding of the challenges that exist when implementing the innovative practice and provide resources to the team to help navigate those challenges (Farahnak et al., 2020). Kouzes and Posner (2012) describe this type of trusting and relational leadership as transformational leadership. A transformational leader can influence or transform the attitudes of their team members to react favorably toward a new, innovative practice.

For the current study, leaders such as the administrators of the education institutions of the radiography programs may have influenced or transformed the program directors' attitudes toward IPE by using transformational leadership skills. These skills include demonstrating an attitude of acceptance for IPE, communicating the benefits of IPE for stakeholders, understanding the challenges that may exist when implementing IPE, and providing resources to program directors to help successfully navigate those challenges. The influence of transformational leaders may be the reason why 76% of the sample studied had a positive attitude toward IPE and why 45% of those with positive attitudes made the decision to use IPE in their program curriculum.

Since IPE is not mandated by JRCERT, the radiography programmatic accreditor, the decision to use IPE in radiography programs is left to the program director. The other 24% of the sample from the current study who had a negative attitude toward IPE and did not use IPE in their programs may not have had the support or influence from their institutions' administrative

leadership to use IPE in their programs, and therefore those program directors chose not to use IPE.

Peers' Influence on Attitude. Professional peers can significantly influence their colleagues' attitudes toward new, innovative practices. Bandura's social learning theory (1986) suggests that individuals model their peers' behaviors if they believe their peers to be trustworthy. The concept of peer modeling is further supported by the principle of social proof, where individuals look to their peers to decide what is appropriate behavior in uncertain situations (Cialdini, 2001). Peer-led professional development can be an effective method for presenting innovative practices in professional peer groups due to the trust and shared experiences among peers (Garet et al., 2001).

For the current study, it is unknown if the sample of program directors' attitudes toward IPE were influenced by their professional peers. However, Reeves et al.'s (2010) systematic review found that sharing successful outcomes and patient care improvements resulting from IPE experiences can be a strong driver for getting professional peers to adopt IPE as an innovative strategy. Likewise, Hammick et al.'s (2007) systematic review stressed that IPE could be effective in challenging and changing stereotypical views of other professions while providing opportunities for collaboration and open discussion. Being aware of stereotypes regarding other professions and recognizing what or who may have influenced those stereotypes is important when working as a collaborative care team. Being open minded and willing to change one's attitude or way of thinking is also important in a collaborative care environment.

Interprofessional communication and collaboration amongst peers plays a significant role in curricular decisions. If a significant quantity of the peer group believes in the value of IPE, it is more likely IPE will be integrated into education programs (Buring et al., 2009). Peers from

the same profession and/or peers from another profession may have played a role in influencing the attitudes of the sample of program directors who participated in the current study.

Routines' Influence on Attitude. Routines play a key role in shaping individuals' attitudes toward practices. The consistent and repeated nature of routines can reinforce beliefs, habits, and behaviors, influencing how individuals perceive and engage in a particular practice. Routines establish and reinforce behavioral patterns. Over time, routines can influence individuals' attitudes, making them more inclined to view a practice favorably or unfavorably (Wood & Neal, 2007).

When a practice becomes routine, comfortable, and safe, individuals spend less cognitive effort thinking about it, which can lead to stronger and more deeply rooted attitudes (Lally et al., 2010). A disadvantage to an individual with a deeply rooted attitude toward a practice is that the individual may not be aware of changes in the practice and may choose to continue with their routine regardless of better alternatives (Sanbonmatsu et al., 2014). Perceptions of change or something new, which can be disruptive to an established routine, may be resisted if the work routine is going to be changed (Walk, 2023).

Established, discipline-specific educational routines and curricula can act as barriers to IPE as routines promote siloed learning and limited interprofessional interactions (Hall & Weaver, 2001). Learning and working in professional silos in healthcare promotes miscommunication which can lead to segmented care and medical error (Boardman, 2017; Davis et al., 2021; Polczynski et al., 2019).

For the current study, survey Question 10 was a focused question that evaluated program directors' attitudes toward the benefits of IPE on their students' learning. The results of Question 10 revealed that 97.7% of the sample agreed or strongly agreed that IPE is beneficial for

increasing student learning, communication, and teamwork. As with any practice, as IPE becomes routine and familiar to faculty, the more IPE experiences faculty can offer their students. The more exposure students have to IPE, the more students can develop a better understanding of communication and teamwork and a deeper understanding of team-based, collaborative care.

Knowledge and Decision Making. In the current study, research Question 2b investigated the relationship between program directors' self-reported knowledge of IPE and the level of use of IPE in their radiography programs. The results of RQ2b suggest that there is a positive association between knowledge and the decision to use or implement IPE in radiography programs. A positive association indicates when one variable increases, the other variable increases. Knowledge relating to IPE implementation in the current study refers to the participants' self-reported knowledge of IPE (Hinderer et al., 2016).

Knowledge is gained by formal learning of information and from experiences, especially experiences which require real-world applications of one's knowledge and build on what one knows (Rababa et al., 2022; Teodorczuk et al., 2016). Experiential learning is the concept of receiving information through experiences, transforming existing information through reflection and thinking, and then using the transformed information in real-life situations (Kolb & Kolb, 2017). Experiential learning is dynamic and cyclical, meaning that experiential learning is never static, and the cycle continues as new information is received, transformed, and used again.

In the professional practice of healthcare, professionals are expected to use their experiences to build new knowledge and make decisions based on their knowledge. *The ASRT Practice Standards for Medical Imaging and Radiation Therapy* states in the Standard 3 rationale on education that, "Education and communication are necessary to establish a positive

relationship and promote safe practices. Advancements in the profession and optimal patient care require additional knowledge and skills through education" (ASRT, 2019). As a member of the patient care team, staying current with new advancements in one's profession and building new knowledge and skills are expected by one's own profession and the other professionals on the care team.

Higher cognitive skills are necessary to make life-changing decisions in intense care situations. Higher cognitive skills such as effective communication, critical thinking, decision making, and problem-solving are necessary to perform effectively in a healthcare environment (Tolks et al., 2016). Healthcare professionals are encouraged to stay current with the best practices in their fields and in healthcare overall. The ASRT's "Standard Thirteen – Research, Innovation and Professional Advocacy" states that imaging professionals should investigate and adopt new, innovative approaches which can be applied in professional practice (ASRT, 2019).

Evidence-informed decision-making (EIDM) is an approach to decision making used to assess the needs of the stakeholders of a healthcare profession and to evaluate the best evidence-based practices that should be used to provide the best quality of care to patients (McKibbon, 1998; PAHO, 2022). The process of EIDM was introduced in 1992 as an evidence-based medicine (Guyatt et al., 1992). However, three decades later, the healthcare industry continues to struggle to streamline EIDM across healthcare professions and to consistently implement current best practices (Gallagher-Ford & Connor, 2020). The process of EIDM promotes accountability and transparency for decisions concerning stakeholders who are involved in the practice of patient care. EIDM involves the use of higher cognitive skills to analyze information, consider multiple perspectives, critically evaluate all options, and then make the best choice (Gallagher-Ford & Connor, 2020). IPE has been recognized to have a positive impact for stakeholders

involved in patient care and is considered an evidence-based, best practice in healthcare (Thomas et al., 2017).

In the current study, program directors' knowledge was quantified by calculating a total subscale score from the survey questions that addressed IPP and IPE. A positive association between knowledge of IPP and IPE and the decision to use IPE in their program suggested that if program directors had increased knowledge of IPP and IPE, then they made the decision to offer IPE to their students. Likewise, if program directors had decreased knowledge of IPP and IPE, then they made the decision not to offer IPE to their students.

In the current study, survey Question 9 was a focused question that evaluated program directors' general knowledge of IPE. The results of Question 9 revealed that 92.3% of the sample agreed or strongly agreed that they were aware that IPE is a teaching method for promoting student learning, communication, and teamwork. These findings also indicated that 7.2% of the sample of program directors disagreed or strongly disagreed that IPE as an evidence-based, best practice in healthcare is a teaching method for promoting student learning, communication, and teamwork. One program director did not respond to Question 9 on the survey, which accounts for the remaining 0.5%. Based on the data results, decision making concerning the use of IPE in healthcare education curricula is influenced by program directors' knowledge of the competencies and skills required to be an effective interprofessional member of the patient care team. Aligning educational content with interprofessional collaboration and education is essential for key stakeholders of student learning (WHO, 2010).

Perception and Decision Making. In the current study, research Question 2c investigated the relationship between program directors' perceptions of IPE and the level of use of IPE in their radiography programs. The results of RQ2c suggest that there is a positive

association between perceptions of IPE and the decision to use or implement IPE. A positive association indicates that when one variable increases, the other variable increases. Perceptions relating to IPE implementation in the current study refer to perceived ideas of interdisciplinary relationships with one's profession and other healthcare professions (Hinderer et al., 2016). Professionals who view another healthcare profession more positively are more likely to be open to working or learning together and/or have a more positive perception of the value of team-based care and other professions' roles on the care team.

Perception is the way an individual views the world. How one perceives the use of a certain practice can be explained by the theory of planned behavior. The theory of planned behavior includes two types of social norms, descriptive and injunctive, that can be used as predictors for the intention to use a certain practice. Descriptive norms are characterized by how individuals perceive their peers will act in a similar situation, and injunctive norms are characterized by how individuals perceive external stakeholders expect them to act in a similar situation (Schelling & Rubenstein, 2021). Positive perceptions of IPE can improve communication, understanding, and collaboration between healthcare professions. Likewise, negative perceptions may emphasize professional stereotypes and silos (Boardman, 2017; Davis et al., 2021; Polczynski et al., 2019; Thistlethwaite, 2012).

For the current study, survey Question 11 was a focused question that evaluated program directors' general perceptions of the importance of preparing students for their future professional experiences working with other healthcare professionals. The results of Question 11 revealed that 94.7% of the sample agreed or strongly agreed that it is important to prepare students for professional experiences working with other healthcare professionals. The findings also indicated that 4.6% of the sample of program directors disagreed or strongly disagreed that

preparing their students to work with other professionals in a team-based, patient-centered care environment is important.

The 4.6% of the sample of program directors who did not agree that preparing their students to work with other professionals in a team-based, patient-centered care environment is important may have perceived that other program directors of the sample would not agree that IPE is important because it is not mandated by JRCERT, indicating the influence of descriptive norms on their decision. Similarly, the 4.6% of the sample may have also perceived that other healthcare professionals and stakeholders involved in their students' learning did not agree that preparing their students to work with other professionals using a team-based, patient-centered approach to care is important because the program directors were not aware of the positive impact IPE has on patient outcomes, indicating the influence of injunctive norms on their decision.

Healthcare professionals and stakeholders may perceive IPE more positively if they see IPE as a method to improve patient outcomes (Hammick et al., 2007). Perceptions of IPE may also improve if accrediting bodies and licensing standards stress the importance of IPE in healthcare education for promoting effective communication and collaborative, team-based, patient-centered care (Frank et al., 2020; Zwarenstein et al., 2009).

Overarching Themes

The following four overarching conclusions summarize findings from the data analysis and discussion of the current study.

First, the level of use of IPE in radiography programs was not the same across radiography programs accredited by JRCERT. Healthcare professionals are encouraged to make informed, ethical decisions when the decision may impact the profession. The ASRT's "Standard

Twelve – Ethics" affirms that any decision made on behalf of the profession should be soundly based on an ethical foundation (ASRT, 2019). Programs that mandated the use of IPE in their curriculum was the most common response found in the present study's survey but was not at a level consistent with what would be expected when following practical and ethical decision-making processes. Programs that offered the use of IPE as an elective was the next most common response, leaving the choice of utilizing IPE up to each student. Programs who did not have IPE opportunities at their institution nor used it in their curriculum was the third most common response. Finally, the least common response, but still notable, was programs that had IPE opportunities at their institution but chose not to use it in their curriculum. Therefore, the results of the present study led to the conclusion that IPE is not being used in all radiography programs' curricula when its use is optional and the decision is left to the program director, even when the use of IPE is supported from the practical and ethical perspectives of decision making.

Second, program directors who had positive attitudes toward the four core competency domains of IPE, including values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork, were more likely to offer IPE opportunities to their students. Likewise, program directors who had negative attitudes toward the four core competency domains of IPE were less likely to offer IPE opportunities to their students. Thus, the results of the present study suggested that radiography program directors' attitudes toward IPE are positively associated with their use of IPE in their program.

Additionally, the results of the present study revealed that attitudes can be influenced by leaders, peers, and routines. Transformational leaders can demonstrate an attitude of acceptance toward a practice, communicate the benefits for stakeholders of the practice, demonstrate an

understanding of the challenges of implementing the practice, and provide resources to navigate the challenges to influence others' attitudes. Attitudes can also be influenced by peers.

Professional peers of the same or different professions can influence attitude toward a practice. Peer-led professional development is an effective way to encourage others to adopt a new practice. Routines can also influence attitude toward a practice. The more someone experiences the practice, the more routine the practice will become.

Third, program directors who had increased knowledge of IPE were more likely to offer IPE opportunities to their students. Similarly, program directors who had less knowledge of IPE were less likely to offer IPE opportunities to their students. Consequently, the results of the present study suggested that radiography program directors' knowledge of IPE is positively associated with their use of IPE in their program. Building on current knowledge through experiential learning is an effective method for generating new knowledge. Evidence-informed decision making comes from the practice of analyzing new information regarding one's choices, considering all choice options, evaluating information concerning all choices, and then making the best choice that benefits the greatest number of stakeholders impacted by the choice. Building new knowledge to make an informed decision is necessary when the decision may affect a profession.

Lastly, program directors who positively perceived the ideas of interdisciplinary relationships with one's profession and other healthcare professions were more likely to offer IPE opportunities to their students. Likewise, program directors who negatively perceived the ideas of interdisciplinary relationships with one's profession and other healthcare professions were less likely to offer IPE opportunities to their students. Therefore, the results of the present

study suggested that radiography program directors' perceptions of IPE are positively associated with their use of IPE in their programs.

Social norms impact the way an individual perceives a new practice. Program directors that do not offer IPE in their program may perceive that other program directors feel the same regarding the use of IPE in their program (or lack thereof), not knowing that other program directors are using IPE in their programs. Similarly, the program directors that do not offer IPE in their program may perceive that stakeholders of the program do not expect them to use IPE or think it is necessary to offer IPE to their students. However, the rationale for the ASRT's "Standard Eleven – Collaboration and Collegiality" states, "To provide quality patient care, all members of the health care team must communicate effectively and work together efficiently" (ASRT, 2019). The criteria imaging professionals must meet to comply with Standard 11 are to create and maintain collaborative relationships with other allied health professionals, promote an understanding of the imaging professions and radiation safety, and share professional expertise with other professions (ASRT, 2019).

Implications for Leadership and Practice

All patients deserve quality, patient-centered, team-based care. The type of health care which provides a patient with a collaborative care team complete with individuals who have specialized skills to contribute to the individual needs of the patient. Patient care begins with the professionals who provide the care. Therefore, it is crucial professionals begin their healthcare journey with the proper education to develop and master the skills needed to provide specialized care. Program directors are the leaders who have oversight of what is included in the curricula taught to healthcare students. Program directors are accountable to the healthcare profession and for upholding the standards of quality care when making decisions about their programs.

The current study revealed that when decisions are left up to the leader, some leaders will rely on their personal considerations to make professional choices as opposed to the ethical or practical considerations for their professional choices, which may or may not align.

When viewing the level of use of IPE in program curricula through a personal lens, IPE looks different for the sample of program directors who participated in the study. Program directors who had positive attitudes toward, increased knowledge of, and a positive perception of IPE offered IPE opportunities to their students. By contrast, program directors who had negative attitudes toward, decreased knowledge of, and a negative perception of IPE did not offer IPE opportunities to their students.

When viewing the level of use of IPE in program curricula through a practical lens, IPE is vastly researched and evidenced to provide a positive impact on student learning, team building, effective communication, and patient outcomes. Peer-reviewed, published research provides evidence-based practices and best practices of a profession that leaders can use to make an informed decision regarding their professional practice choices.

When viewing the level of use of IPE in program curricula through an ethical lens, the ethic of profession provides an ethical framework to support the foundation of a decision-making process for leaders of any profession. The ethic of profession includes three individual theories: the ethics of critique, care, and justice. However, when applied to a profession, the combination of all three theories can provide a thorough and consistent process for anyone making decisions that impact stakeholders of the profession.

Following a consistent process when making decisions that impact stakeholders of a profession would ensure that practical and ethical considerations were regarded prior to making the decision. The author of the current study has designed a stepwise process to guide leaders of

a profession to consistently consider the practical and ethical considerations of the profession prior to making a decision.

The DRE Process: A Pathway to Making Ethical Decisions

The Decisions Reinforced by Ethics (DRE) Process was created based on information from the current study (see Figure 3). The ethic of profession provides the foundation for the DRE process. When a leader is faced with a professional decision, the DRE process can be utilized to evaluate the choices being considered before making the decision. The DRE process provides a theoretical framework needed to ensure accountability and transparency when making decisions that affect stakeholders of a profession.

The theoretical framework for the DRE process is based on the ethic of profession theory which includes the ethics of critique, care, and justice. Utilizing the three ethical theories within the DRE process ensures the decision maker can clearly justify their decision choice based on ethical and practical considerations as opposed to personal considerations.

The DRE process begins with reviewing the choices through the ethic of critique. The first phase of the process allows the leader to evaluate the decision choices based on information provided by leaders who govern the profession. Leaders who govern the profession may look different for various professions, however, those governing a profession may include professional societies, accreditors, credentialing bodies, and the available knowledge of evidence-based practices and/or best practices. After consulting information provided by the leaders who govern the profession, the decision maker should consider the information provided and move to the second phase of the process.

The second phase of the DRE process includes the ethic of care. The ethic of care allows the leader to evaluate the decision choices based on the needs of the key stakeholders of the

profession who will be affected by the decision. Key stakeholders of a profession can also be vastly different for various professions. However, key stakeholders of a profession include the professionals themselves, the customers the profession serves, the people who are affected by those customers, and so on. After considering the needs of the key stakeholders of the profession, the decision maker should consider how the decision choice will affect the stakeholders and move to the third phase of the process.

The third phase of the DRE process includes the ethic of justice. The ethic of justice allows the leader to evaluate the decision choices based on the decision that will result in the greatest good for the greatest number of stakeholders involved. The ethic of justice helps to keep the scope of decision making transparent and keeps leaders accountable for why a certain decision is made.

After a comprehensive review of the knowledge and information gained from the three phases of the DRE process, the leader can make an informed, ethical, practical, and professional decision. However, if at any point in the process the leader does not evaluate information from one of the phases, the leader must consider if their attitudes, knowledge, or perceptions of the choices are informing their decision not to continue through the phases of the DRE process. Personal considerations can be utilized to evaluate the choices as long as the choice is informed by evidence-based knowledge of the choice.

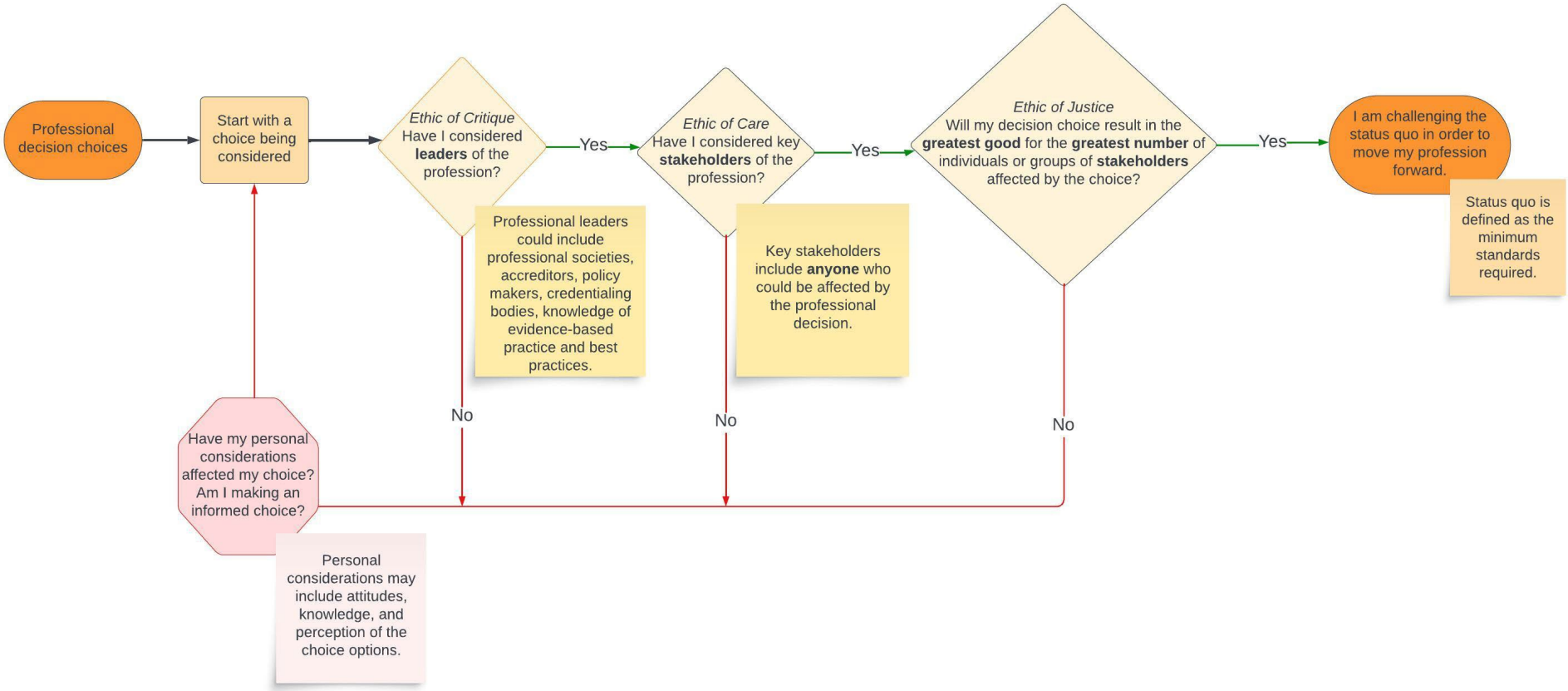
Ethical decision making includes challenging the status quo and evaluating the practical needs of a profession as well as the needs of stakeholders of the profession when considering choice options. Maintaining the status quo is not necessarily unethical; however, challenging the status quo promotes growth and moving the profession forward. Utilizing the DRE process

would provide consistent and transparent decisions throughout a profession and ensure that all stakeholders of the profession are the focus when decisions are made.

When utilizing the DRE process for the use of IPE in the current study, it was revealed that not all students in radiography programs accredited by JRCERT received equal curriculum content and interprofessional experiences. If all radiography students do not have the proper knowledge or skills to work effectively as a member of the patient care team, then not all patients will receive patient-centered, team-based care.

Figure 3

Decisions Reinforced by Ethics Process



Recommendations for Future Research

Based on the findings of the current study, there is a chance that an education leader may base a professional decision on considerations that are not ethical or practical. Personal considerations, such as attitudes, knowledge, and perceptions, of a choice may play a larger role in decision making than leaders realize. Therefore, there is more to learn about how personal considerations impact leaders' decisions.

For instance, in the current study, there are unknowns about what exactly led program directors to answer the survey questions in the way they did. Program directors' personal considerations were measured in attitudes, knowledge, and perceptions subscales. Each subscale group included a series of individual item questions pertaining to attitudes, knowledge, and perceptions regarding IPE. It may be necessary to know if a certain item of a subscale was associated more with the level of use of IPE in program curricula than the others, giving that item a stronger influence over directors' decisions. A deeper assessment of the subscale items may lead to a better understanding of what exactly influences a program director's decision to implement IPE when the choice is up to them. A better understanding of what influences the decision-making process regarding the use of IPE in their curriculum will also help provide better resources and support for the leaders making the decisions.

Moreover, the current study uncovered quantitative information related to personal considerations. Because personal considerations are inherently more qualitative, there is opportunity for better clarification on the current findings that could potentially unveil more helpful information regarding program directors' decision-making processes that would provide additional resources to help directors make similar decisions in the future. A qualitative study could further investigate these factors and would also provide program directors more flexibility

to respond freely and share personal experiences, helping researchers uncover information related to personal considerations that a quantitative study could not achieve (Rodrigues da Silva Noll Goncalves et al., 2023). A mixed methods study assessing the association between personal considerations that includes more natural, interview-like questions would also support the deeper investigation needed into how decision making for leaders is influenced by personal considerations, even when a choice is practically and ethically supported (Marshall et al., 2020).

Personal considerations such as attitudes, knowledge, and perceptions can also be associated with each other, indicating that two or more personal considerations could influence leaders' decision-making processes (Grice et al., 2018; Puspitasari et al., 2020; Rababa et al., 2022; Yung et al., 2020). Understanding factors that influence how an individual makes decisions would be beneficial to educators teaching learners how to develop or improve their higher cognitive decision-making skills in a variety of situations.

Finally, the current study revealed that in the field of radiography, when IPE was left as an optional choice for program directors to make regarding their curriculum, there was an underwhelming amount of program directors who chose to include IPE experiences in their curriculum. This reveals that leaders bound by the same educational standards are providing vastly different learning opportunities to their students. When considering the transparency and accountability required of directors of radiography programs accredited by JRCERT, this raises questions regarding what decision-making process leaders use when considering optional learning opportunities for their students. As the current study emphasized, IPE is a critical educational tool for students in healthcare education programs; so much so that other healthcare education programs have mandated the use of IPE.

In healthcare fields, like radiography, where a practically and ethically backed educational choice is not guaranteed to be implemented to all students, this brings up concern about what other opportunities radiography students are missing in their education. While programmatic accreditors, such as JRCERT, hold programs accountable for the integrity of their program, accreditation is voluntary and is a working partnership between the accreditor and the program. Accreditation is a peer-review process to ensure that students of radiography programs are prepared to enter the healthcare environment as an effective member of the care team (Frank et al., 2020). Although JRCERT revisits their standards every 10 years (JRCERT, 2023), healthcare is continuously changing and therefore requires radiography program directors to be aware of changes in healthcare to stay up to date with the best, evidence-based practices.

The ASRT also provides a radiography curriculum outline that supports the needs of the profession which JRCERT adopts for their own program curriculum analysis grid. Radiography programs accredited by JRCERT are expected to provide JRCERT the completed curriculum analysis grid as part of accreditation requirements. The curriculum analysis grid offers an organized approach to ensure programs can provide course references for the content found on the ASRT curriculum outline. An awareness of the current needs of the profession ensures that students are not missing out on beneficial information they will need while navigating a new profession when they join the workforce.

At the time of data collection for the current study, the ASRT did not include IPE in the 2017 adopted curriculum. However, in 2022, the ASRT adopted a revised radiography curriculum which included IPE and collaborative practice, as well as evidence-based practice, as essential knowledge for entry-level radiography professionals. At the time the ASRT adopted the 2022 radiography curriculum, JRCERT added the new curriculum to their program analysis grid.

Currently, directors of radiography programs accredited by JRCERT should be addressing IPE, collaborative practice, and evidence-based practice in their programs.

The findings of the current study raise the question of how program directors of radiography programs accredited by JRCERT can be held accountable for revisiting the current needs of the profession, best practices, and evidence-based practices in a timely manner, independent of JRCERT's standards revision timeframe of every 10 years. Considering the continuously changing nature of healthcare, it may be time educational leaders consider the possibility of an evidence-based quality improvement initiative that can occur at any time in order to keep the profession moving forward.

Limitations

A couple of limitations of the current study were present in the research. Because program directors self-reported their attitudes, knowledge, and perceptions of IPE, response bias is a limitation. Program directors may not have represented their true attitudes, knowledge, perceptions, or level of use of IPE in their programs accurately, either intentionally or unintentionally. Inaccurate responses can also be provided if a participant misunderstands questions or does not know how to answer the question (Rahman, 2016).

Researcher bias is also a possible limitation of the current study as the researcher is a member of the population studied and their professional knowledge and experiences could have guided the study's design and research.

Conclusion

The purpose of this study was to provide a baseline in the literature regarding the use of IPE in radiography programs and to investigate what influences radiography program directors' decisions to implement IPE into their programs if it is not mandated by accreditation standards.

The findings from this study imply that although optional for radiography educational programs, many programs are already providing IPE experiences at some level as a teaching strategy for their students. On the contrary, the findings also suggest that there are still radiography programs that have not been providing IPE experiences to their students. Moreover, the results emphasized a significant discovery that personal considerations of program directors may be influencing their decision to provide IPE experiences to their students or not. The current study highlights the importance of providing leaders support for making decisions regarding IPE use when the choice to implement it into radiography curricula is up to the leaders.

Beyond looking into program directors' choice to implement IPE, the current study also provides valuable insight on leaders' decision-making process for this choice. First, the study emphasized that the personal considerations of a decision maker should not be overlooked in the decision-making process, with understanding that personal considerations can weigh just as heavily as practical and ethical considerations do on a decision. Second, the implications of the study resulted in a more effective way to make decisions by incorporating practical and ethical considerations into a stepwise process. The DRE process encourages leaders to make the best decision possible for the greatest number of stakeholders affected by the decision when the choice is left to their discretion.

Today, there are internal and external pressures that make it easy to turn down a new idea when adopting it is optional. However, folding to those pressures may result in a decision that does not provide the best choice possible to those affected by the decision. Using the DRE process will help eliminate this issue in the future as this process promotes informed, ethical, practical, and professional decision making, provides an avenue to support the growth of ethical leadership amongst any profession, and assists in keeping the profession moving forward.

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APPENDIX A. STUDY SURVEY

Use of Interprofessional Education (IPE) in Radiography Education

Start of Block: Block 1

Q0 TITLE: Informed Consent for Use of Interprofessional Education in Radiography Education

INTRODUCTION OF THE RESEARCHER: I am Dana Eskins, and my advisor is Dr. Judith May. I am a doctoral candidate in the Leadership Studies Program offered by the School of Educational Foundations, Leadership, and Policy (EFLP) at Bowling Green State University. My research topic is about radiography program directors' attitudes, knowledge, and perceptions of interprofessional education (IPE) and the level of use of IPE in their programs. You are being asked to participate in this study because you are a program director for a Joint Review Committee on Education in Radiologic Technology (JRCERT) accredited radiography program. JRCERT provided contact information for program directors of JRECERT-accredited radiography education programs.

PURPOSE: The purpose of this study is to understand whether JRCERT-accredited program directors' attitudes, knowledge, and perceptions of IPE impact the use of IPE in their programs. This study will provide a starting point on how to guide standards and resources to help program directors make informed decisions about the use of IPE grounded in evidence-based practices.

PROCEDURE: If you consent to participate in this study by clicking on the arrow below, you will continue to the survey questions related to your program's use of IPE and your perspectives about IPE. Survey completion is expected to take approximately 5-10 minutes.

VOLUNTARY NATURE: The study adheres to current BGSU COVID-19 guidelines. Your participation is completely voluntary. You are free to withdraw at any time. You may decide to discontinue participation at any time without explanation or penalty. Your decision whether to participate will not affect your relationship with Bowling Green State University.

ANONYMOUS PROTECTION: Data will be anonymous for this research project. "Anonymous" means even the researcher cannot determine the identities of the participants. All information from this survey will be aggregated to provide a representative sample of program directors from JRCERT-accredited programs. All survey data will be stored in a secure, password protected Qualtrics account and aggregated data will be stored in a password-protected computer drive with double authenticated security that can only be accessed by the principal investigator. Some employers may use tracking software so you may want to complete the survey on a personal computer. You should not leave the survey open if using a public computer or a computer that others may have access to. You should clear your browser cache and page history after completing the survey.

RISKS: The risks involved in participation are no greater than those experienced in daily life.

CONTACT INFORMATION: If you have any questions, please send an email to Dana Eskins at danae@bgsu.edu, or to my advisor, Dr. Judith May, at judyjac@bgsu.edu. You may also contact the Chair of the Bowling Green State University Institutional Review Board at 419-372-7716 and irb@bgsu.edu if you have any questions about your rights as a participant in this research.

Thank you for your time.

I have been informed of the purposes, procedures, risks, and benefits of this study. I have had the opportunity to have all my questions answered and I have been informed that my participation is completely voluntary. By clicking the arrow below, I agree to participate in this research.

End of Block: Block 1

Start of Block: Default Question Block

Q1. I am a current program director for a JRCERT-accredited radiography program.

- ○ Yes (1)
- ○ No (3)

Skip To: End of Block If I am a current program director for a JRCERT accredited radiography program No

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Q2. What type of institution sponsors your program?

- ○ Four-year College/University (1)
- ○ Community College (2)
- ○ Technical College/Institute (3)
- ○ Hospital/Medical Center (4)
- ○ Military/Government (5)
- ○ Proprietary (6)
- ○ Consortium (7)

Q3. What is your program terminal award granted?

- ○ Certificate (1)
- ○ Associate (2)
- ○ Bachelor (3)

Q4. Specify which U.S. region your program is located in.

- ○ New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut) (1)
- ○ Mid-Atlantic (New York, Pennsylvania, New Jersey) (2)
- ○ East North Central (Wisconsin, Michigan, Illinois, Indiana, Ohio) (3)
- ○ West North Central (North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri) (4)
- ○ South Atlantic (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Puerto Rico) (5)
- ○ East South Central (Kentucky, Tennessee, Mississippi, Alabama) (6)
- ○ West South Central (Oklahoma, Texas, Arkansas, Louisiana) (7)
- ○ Mountain (Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico) (8)
- ○ Pacific (Alaska, Washington, Oregon, California, Hawaii) (9)

Q5. How many years of experience do you have as a director of a JRCERT-accredited radiography program? (Round to the nearest year.)

▼ 1 (1) ... 50 (50)

Q6. What year did you become ARRT certified in radiography?

▼ 1970 (1) ... 2015 (46)

Q7. What is your age in years? (Round to the nearest year.)

▼ I prefer not to answer (1) ... 70 (51)

Q8. Do you provide your radiography students with interprofessional education opportunities?

- ○ Yes (1)
- ○ No (0)

Q9. I am aware of interprofessional education as a teaching method for promoting student learning, communication, and teamwork.

- ○ Strongly Disagree (0)
- ○ Disagree (1)
- ○ Agree (2)
- ○ Strongly Agree (3)

Q10. Interprofessional education is beneficial for increasing student learning, communication, and teamwork.

- ○ Strongly Disagree (0)
- ○ Disagree (1)
- ○ Agree (2)
- ○ Strongly Agree (3)

Q11. Interprofessional education is important for preparing students for their professional experiences working with other healthcare professionals.

- ○ Strongly Disagree (0)
- ○ Disagree (1)
- ○ Agree (2)
- ○ Strongly Agree (3)

Q12. Providing interprofessional education experiences to my students is the appropriate choice to make, even though it is not currently required by JRCERT.

- ○ Strongly Disagree (0)
- ○ Disagree (1)
- ○ Agree (2)
- ○ Strongly Agree (3)

Q13. Choose the following statement that best describes the use of interprofessional education in your radiography program.

- ○ There are no interprofessional education opportunities within my educational institution, and it is not incorporated into the program. (0)
- ○ There are interprofessional education opportunities within my educational institution, but radiography students are not offered opportunities to participate. (1)
- ○ There are interprofessional education opportunities within my educational institution and radiography students can elect to participate, but it is not incorporated into the program. (2)
- ○ All radiography students participate in interprofessional education opportunities because it is incorporated into the program. (3)

Q14-20 Overall Perception

	Strongly Disagree (0)	Disagree (1)	Agree (2)	Strongly Agree (3)
Q14. Individuals in other professions respect the work done by my profession. (1)	○	○	○	○
Q15. Individuals in my profession need to cooperate with other professions. (2)	○	○	○	○
Q16. Individuals in my profession must depend upon the work of those in other professions. (3)	○	○	○	○
Q17. Individuals in other professions think highly of my profession. (4)	○	○	○	○
Q18. Individuals in my profession make every effort to understand the capabilities and contributions of other professions. (5)	○	○	○	○
Q19. Individuals in my profession have good relations with people in other professions. (6)	○	○	○	○
Q20. Individuals in other professions often seek the advice of people in my profession. (7)	○	○	○	○

Q21-28 Interprofessional Education

	Strongly Disagree (0)	Disagree (1)	Agree (2)	Strongly Agree (3)
Q21. Interprofessional practice would be improved by enabling healthcare professional students to **be educated together.** (1)	○	○	○	○
Q22. Interprofessional practice would be improved by enabling healthcare professional students to **do teamwork together**. (2)	○	○	○	○
Q23. Interprofessional practice in healthcare is present. (3)	○	○	○	○
Q24. Interprofessional practice in healthcare requires communication skills that most healthcare programs currently do not effectively teach. (4)	○	○	○	○
Q25. Interprofessional education of different healthcare professions is necessary. (5)	○	○	○	○
Q26. I feel confident in my knowledge of interprofessional education. (6)	○	○	○	○
Q27. I feel confident in my abilities to teach interprofessionalism. (7)	○	○	○	○
Q28. I feel confident in my abilities to practice interprofessionalism.	○	○	○	○

Q29-30 Values/Ethics for Interprofessional Practice

	Strongly Disagree (0)	Disagree (1)	Agree (2)	Strongly Agree (3)
Q29. Interprofessional practice results in more effective patient care. (1)	○	○	○	○
Q30. Different healthcare professions share the same values. (2)	○	○	○	○

Q31-32 Roles/Responsibilities

	Strongly Disagree (0)	Disagree (1)	Agree (2)	Strongly Agree (3)
Q31. When working with complex patients/clients, my profession seeks the help of healthcare professionals outside of their practice. (1)	○	○	○	○
Q32. My profession has a clear understanding of the roles of other healthcare providers with whom they interact on a regular basis. (2)	○	○	○	○

Q33-34 Interprofessional Communication

	Strongly Disagree (0)	Disagree (1)	Agree (2)	Strongly Agree (3)
Q33. My profession can easily communicate with other healthcare professionals about important issues. (1)	○	○	○	○
Q34. Being able to work as an interprofessional team member is an important skill in my profession. (2)	○	○	○	○

Q35-36 Teams and Teamwork

	Strongly Disagree (0)	Disagree (1)	Agree (2)	Strongly Agree (3)
Q35. My profession encourages teamwork between healthcare professionals. (1)	○	○	○	○
Q36. I am aware of techniques that can be used to constructively manage disagreements that occur between different professions in healthcare. (2)	○	○	○	○

Q37. What do you perceive as a challenge(s) when incorporating or considering incorporating interprofessional education into your program's curriculum?

_____
_____
_____
_____
_____

End of Block: Default Question Block

APPENDIX B. REQUEST USE OF IPKAS

From: Hinderer, Katherine
To: Eskins, Dana R
Subject: RE: Request for use of IPKAS
Date: Tuesday, October 22, 2019 2:00:36 PM
Attachments: image001.png

Yes, you have my permission to modify.

Katie Hinderer, PhD, RN, CCRN-K, CNE
Nurse Scientist
Institute for Nursing Research and Evidence Based Practice
Connecticut Children's
10 Columbus Blvd.| Hartford, CT 06106
860 - 837-5598 (office)| khinderer@connecticutchildrens.org
AskNursingResearch@connecticutchildrens.org
connecticutchildrens.org

From: Eskins, Dana R <Dana.Eskins1@mercycollege.edu>
Sent: Monday, October 21, 2019 3:24 PM
To: Hinderer, Katherine <KHinderer@connecticutchildrens.org>
Subject: Re: Request for use of IPKAS

HI Katie,
Thank you again for sending this. Can your instrument be altered in any way? I have a few demographic questions that I would like to add.
Dana

Dana R. Eskins, MEd., R.T(R)(CT), RDMS
Program Director, Associate of Science in Radiologic Technology
Assistant Professor
Mercy College of Ohio
2221 Madison Avenue Toledo, Ohio 43604
419-251-1737 (O) 419-251-8982 (F)

office: M4602
dana.eskins@mercycollege.edu

Mercy College of Ohio, a Catholic institution with a focus on healthcare, educates and inspires students to lead and to serve in the global community.

From: Hinderer, Katherine <KHinderer@connecticutchildrens.org>
Sent: Monday, October 21, 2019 9:53 AM
To: Eskins, Dana R <Dana.Eskins1@mercycollege.edu>
Subject: RE: Request for use of IPKAS

Hi Dana,
Please find our attached paper with the IPKAS. You have my permission to use this instrument with the understanding that you will acknowledge our group as authors and cite our paper in any subsequent works referencing the IPKAS. Best of luck on your study.
Katie

Katie Hinderer, PhD, RN, CCRN-K, CNE
Nurse Scientist
Institute for Nursing Research and Evidence Based Practice
Connecticut Children's
10 Columbus Blvd.| Hartford, CT 06106
860 - 837-5598 (office)| khinderer@connecticutchildrens.org
AskNursingResearch@connecticutchildrens.org
connecticutchildrens.org

From: Eskins, Dana R <Dana.Eskins1@mercycollege.edu>
Sent: Wednesday, October 16, 2019 3:57 PM
To: Hinderer, Katherine <KHinderer@connecticutchildrens.org>
Subject: Request for use of IPKAS

Hi Dr. Hinderer,

APPENDIX C. IRB EXEMPT LETTER

BGSU
BOWLING GREEN STATE UNIVERSITY

Office of Research Compliance

Institutional Review Board

DATE:	May 25, 2022
TO:	Dana Eskins, Ed.D
FROM:	Bowling Green State University Institutional Review Board
PROJECT TITLE:	[1878428-2] ATTITUDES, KNOWLEDGE, AND PERCEPTION: THE DECISION OF A RADIOGRAPHY PROGRAM DIRECTOR TO IMPLEMENT THE USE OF INTERPROFESSINAL EDUCATION IN CURRICULUM THROUGH THE LENS OF ETHICAL LEADERSHIP
SUBMISSION TYPE:	Revision
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	May 24, 2022
REVIEW CATEGORY:	Exemption category #2

Thank you for your submission of Revision materials for this project. The Bowling Green State University Institutional Review Board has determined this project is exempt from IRB review according to federal regulations AND that the proposed research has met the principles outlined in the Belmont Report. You may now begin the research activities.

As an Exempt review, changes may be made to the study without IRB approval. However, amendments or modifications to Exempt studies that *substantively changes or alters* the criteria used to make the initial Exempt determination must be submitted to the IRB for approval.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact the Institutional Review Board at 419-372-7716 or irb@bgsu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Bowling Green State University Institutional Review Board's records.