Non-Clinician Involvement in Online Interprofessional Health Sciences Education:

Educator Experiences and Attitudes

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Dedication

This thesis is dedicated to my parents Tom and Nadine Helbing, as well as my sister Joy Helbing. Thank you for the love of education you instilled in me from a young age and the support you showed me while I completed this degree.

Acknowledgements

I would like to acknowledge the members of my thesis committee for their guidance, feedback, and support throughout this process. I would also like to acknowledge my librarian colleagues Emily Alagha, Stefanie Lapka, and Erica Lopez for providing much-appreciated feedback on my research and writing, in particular on the study questionnaire. Finally, I would like to thank the research participants for their willingness to spend the time and effort necessary to share their stories, providing the valuable data that made this study possible.

Abstract

Background: Interprofessional education (IPE) occurs when students from different health professions learn about, from, and with each other. These educational experiences foster effective collaboration in professional settings with the goal of improving health outcomes. IPE adoption has not been ubiquitous, likely due to logistical barriers including a lack of facilitators and the need to move education online due to the COVID-19 pandemic. Little research on this topic has incorporated health sciences librarians and other non-clinicians. **Purpose:** The purpose of this study was to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. The following research questions guided this study: 1) What knowledge, skills, and abilities do health sciences educators deem necessary for facilitators of IPE activities? 2) What are health sciences educators' experiences with and attitudes toward non-clinician facilitators of IPE activities? 3) What are health sciences educators' experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities? 4) How do these factors differ for in-person as compared to online settings? **Methods:** This qualitative study was carried out utilizing a novel questionnaire that included both multiple-choice and free-text questions. The latter were grounded in critical incident technique (CIT), a research methodology that uses direct observations of human behavior to solve practical problems. CIT research asks participants to recall and describe a time when a phenomenon of interest occurred. It was utilized in this study to identify what general factors, and what characteristics of facilitators, are associated with successful IPE activities. The

questionnaire was distributed electronically to the study's population of health sciences administrators, faculty, and staff in Texas who were involved with IPE. There were 48 responses. The multiple-choice data were analyzed via descriptive statistics, while the free-text data were coded and analyzed via inductive thematic analysis principles. **Results:** Educators recognized a wide range of characteristics needed by IPE facilitators but viewed interpersonal skills as the most important. They had substantial experience with online IPE and recognized the importance of engagement when utilizing that format. They also had considerable experience with non-clinician facilitators of IPE activities but less with health sciences librarians. Educator attitudes toward online IPE and non-clinician facilitators of IPE, including librarians, were positive. **Conclusion:** The findings of this study indicated that non-clinicians can build upon their existing skillsets and increase their involvement with IPE. They can make the case at their institutions that interpersonal skills and the ability to elicit engagement are more important to IPE than a clinical background. Proper facilitator training will help to ensure success. Utilizing online formats and having a larger pool of facilitators from which to draw can increase the incidence of IPE, resulting in more collaborative care and improved patient outcomes.

Keywords: collaborative practice, critical incident technique, interprofessional education, health sciences librarians, health sciences librarianship

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Chapter I

Introduction

Interprofessional education (IPE) was defined by the World Health Organization (WHO) in the landmark 2010 publication "Framework for Action on Interprofessional Education and Collaborative Practice" as education that "occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes" (p. 7). They contend that health sciences students who take part in IPE will be better prepared for the kind of collaborative practice that can improve outcomes in real-world health care settings than students who do not (World Health Organization, 2010). Six years earlier the Institute of Medicine - now the National Academy of Medicine (NAM) – made a similar call when it urged major changes in the education of health professionals to improve the quality of healthcare. One of their potential solutions urged that students should be trained to work in interdisciplinary teams (Greiner & Knebel, 2004). As of 2013, accrediting bodies for dentistry, medicine, nursing, occupational therapy, pharmacy, physical therapy, physician assistant, and public health programs all include standards related to IPE (Zorek & Raehl, 2013). Subsequently IPE has been a popular topic for educational research across the health professions. A recent review found that the top disciplines contributing to the IPE literature are medicine, nursing, pharmacy, dentistry, occupational therapy, and physical therapy (Islam et al., 2019). The IPE methods reported in the literature most often are in the form of simulations and experiential training, although some programs opt for more passive activities such as case discussions and presentations (Fox et al., 2018). While there has been a high volume of varied research on this topic, little of that research has

incorporated health sciences libraries or librarians.

A major new barrier to the implementation of the vision of ubiquitous IPE and collaborative practice arose with the COVID-19 pandemic. At the same time that the pandemic exacerbated the pre-existing shortage of healthcare workers, increasing the need for new professionals (American Hospital Association, 2021), social distancing concerns brought about a widespread transition to online education and the removal of students from clinical rotations (Iyer et al., 2020; Katirji et al., 2020; Potts, 2020; Prabhakar et al., 2020; Slanetz et al., 2020). As online education increasingly becomes the norm, educational institutions providing health sciences programs need to re-think their IPE activities, which have typically included groups of students in close physical proximity (Fox et al., 2018). In response to this paradigm shift, there has been a proliferation of statements, resource lists, and webinars on the impact of COVID-19 on IPE (American Association of Colleges of Nursing, 2020; Interprofessional Education Collaborative, 2020; National Center for Interprofessional Practice and Education, 2020; Texas IPE Consortium, n.d.). The COVID-19 pandemic has been mitigated by the development of new vaccines and medical treatments, but there is recognition that it will not be the world's last pandemic (World Health Organization, 2020a). Expert analyses in academia have predicted that many of the changes to higher education which have occurred since March 2020 – including shifts to online education – will be permanent (Chronicle Contributors, 2020; Witze, 2020).

While this move to online platforms was unprecedented for many educators in the health sciences, librarians have well-established experience in online spaces (Bailey et al., 2004; Bury et al., 2006; Konieczny, 2010; Levy, 2005; Sheffield, 2006; Spring, 2016;

Sullo et al., 2012; Young, G. et al., 2017). Librarians have long used web-based tools for reference (Brunvand, 2004; Meert-Williston & Sandieson, 2019; Peters, 2018), instruction (Nielsen, 2014; Sochrin, 2004), and consultation (Maddox & Stanfield, 2019); in fact, many health sciences libraries are fully or predominantly virtual, meaning they provide their collections and services online (Dexter et al., 2019). Additionally, many librarians complete their graduate degrees online and thus have relevant experience as online learners. Two-thirds of American Library Association-accredited programs offer a 100% online option (American Library Association, 2020). Greater involvement from health sciences librarians may provide an opportunity for health professions programs to continue to make progress and improve upon the adoption of IPE and collaborative practice, even during and after a widespread transition to online education.

Statement of the Problem

There has been a decades-long global push for IPE. The Centre for the Advancement of Interprofessional Education (CAIPE), an international think tank, was founded in 1987 (Centre for the Advancement of Interprofessional Education, n.d.), and ten years later its newsletter provided another widely cited definition for IPE as "occasions when two or more professions learn together with the object of cultivating collaborative practice" (Vanclay, 1997, p. 19). The efforts by other prestigious healthcare organizations such as NAM and WHO to improve the adoption of IPE in the health sciences are long-standing (Greiner & Knebel, 2004; World Health Organization, 2010). Health sciences libraries have been deeply involved in health sciences education, particularly in the area of evidence-based practice (EBP) (Conlogue, 2019; Kronenfeld et al., 2007; Muellenbach et al., 2018). They have also been active in the online learning

arena (Bailey et al., 2004; Bury et al., 2006; Konieczny, 2010; Levy, 2005; Sheffield, 2006; Spring, 2016; Sullo et al., 2012; Young, G. et al., 2017). However, they have played a smaller role in the provision of IPE. This may be because most IPE activities are focused on clinical simulations and experiential training (Fox et al., 2018), where librarians' experience is less relevant.

Students of all health professions need to learn similar library and information literacy skills in order to be successful in their programs (American Library Association, 2015). Additionally, libraries are by nature interdisciplinary spaces open to all, potentially making them the ideal inclusive settings in which to bring together students and educators from diverse disciplines (Young, L.M. et al., 2016). Health sciences librarians should collaborate with educators to provide online IPE activities for students during and beyond health sciences education's shift online due to the COVID-19 pandemic. These activities can expose students to interprofessional experiences early in the curriculum while they learn needed library and information literacy skills in interdisciplinary teams. Such collaborations have not taken place in a widespread manner thus far.

Purpose of the Study

Health professions educators need a better understanding of the factors that help and hinder the provision of IPE, particularly as they relate to facilitators. Such an understanding would enable them to best utilize the knowledge, skills, and abilities of the individuals working at their institutions, particularly in light of the major shift from primarily in-person to more online formats for IPE due to the COVID-19 pandemic. Librarians have relevant experience in health sciences education, especially in online

settings; however, they have typically not been deeply involved in IPE. There may be an opportunity for librarians to contribute in this area by acting as planners and facilitators of IPE activities. The purpose of this study was to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians.

Research Questions

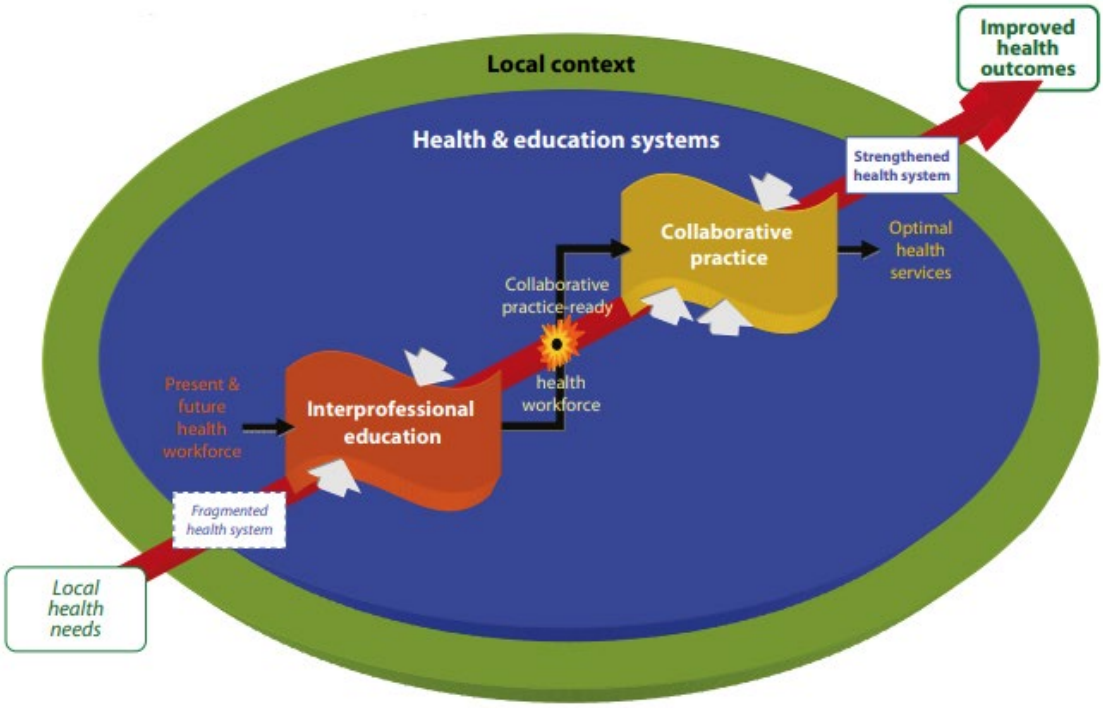
The following research questions were intended to provide answers to the dilemma posed in the statement of the problem and guided this study:

1. What knowledge, skills, and abilities do health sciences educators deem necessary for facilitators of IPE activities?
2. What are health sciences educators' experiences with and attitudes toward non-clinician facilitators of IPE activities?
3. What are health sciences educators' experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities?
4. How do these factors differ for in-person as compared to online settings?

Conceptual Framework

Figure 1

WHO Interprofessional Education Conceptual Framework



Note. From "Framework for Action on Interprofessional Education and Collaborative Practice," by World Health Organization, 2010 (http://whqlibdoc.who.int/hq/2010/WHO_HRH_HPN_10.3_eng.pdf). Copyright 2010 by World Health Organization.

The conceptual framework for this study builds on one put forth by WHO in the "Framework for Action on Interprofessional Education and Collaborative Practice" (World Health Organization, 2010). The WHO model recognizes the fragmented nature of many of the world's health systems. It also posits that health issues are increasingly complex, and need to be managed collaboratively by diverse teams of professionals.

Additionally, the model describes that health professions students must experience IPE in order to gain the skills needed to function effectively in a collaborative practice environment. The model recognizes that collaborative practice optimizes the skills of team members to improve care, strengthens the health system, and leads to improved health outcomes (World Health Organization, 2010). The results of this study informed a reimagining of this conceptual framework which is displayed in Figure 26 and discussed in detail in Chapter V.

Context for the Study

The study occurred in Texas, the second largest state both geographically (United States Census Bureau, 2010) and in population (United States Census Bureau, 2019). Texas is home to the Texas Medical Center, "the largest medical city in the world" (Texas Medical Center, n.d., para. 1). The state contains fifteen medical schools, and rapid growth is evidenced by a third of those being founded in the last decade (Texas Medical Association, 2020). There are also a large number of allied health programs located in the state. Most of these programs are supported by medical or health sciences libraries which employ one or more health sciences librarians. There are 11 Texas members of the South Central Academic Medical Libraries (SCAMeL) consortium, a group of libraries supporting medical schools in the south central region of the United States (South Central Academic Medical Libraries Consortium, 2022).

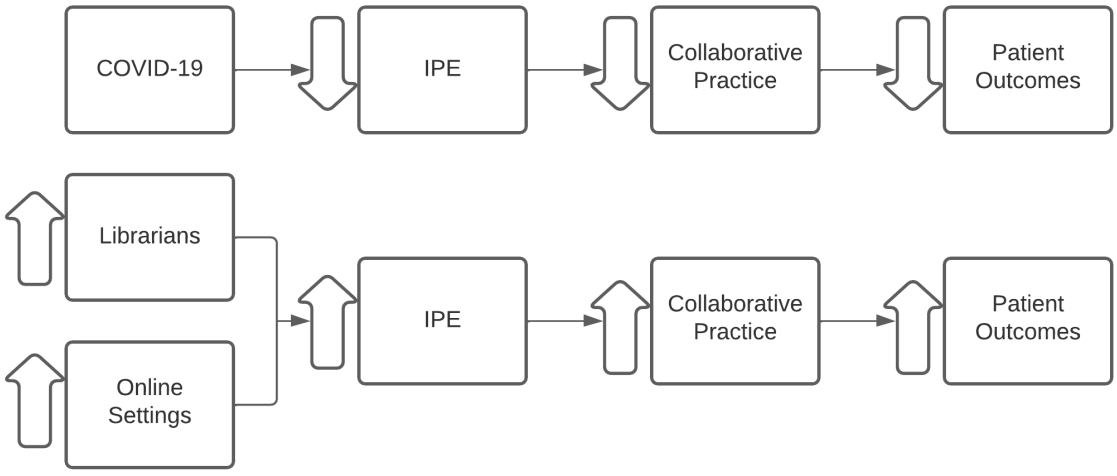
Significance of the Problem

It is theorized that ubiquitous adoption of IPE will increase collaborative practice and improve patient outcomes (Brashers et al., 2015). Research has shown that early IPE experiences have a positive impact on collaborative practice (King et al., 2017). As is

displayed in the top half of Figure 2, with COVID-19 pushing education to online platforms, there is a risk that programs have decreased the number of IPE activities available for students due to logistical difficulties and the need for social distancing. This decrease could result in less collaborative practice, diminished patient outcomes, and ultimately a loss of momentum in achieving the vision set forth by NAM and WHO in their landmark documents published earlier this century (Greiner & Knebel, 2004; World Health Organization, 2010). Meanwhile, librarians have relevant experience in health sciences education and the online learning arena, and most educational institutions have access to a library and librarians. As illustrated in the bottom half of Figure 2, more involvement from librarians, particularly in online settings, could help to regain the needed momentum for IPE to achieve increased collaborative practice and improved patient outcomes.

Figure 2

Significance of the Problem



Educational Value of the Study

The purpose of this study was to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. The results of this study can inform how non-clinicians and librarians approach the topic of IPE involvement with their faculty and administration, offering to collaborate with clinicians as supporters, planners, and facilitators of these activities. This involvement can help maintain the IPE momentum of health sciences programs, even during the COVID-19 pandemic and beyond.

Definitions

Collaborative Practice: "Happens when multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care. It allows health workers to engage any individual whose skills can help achieve local health goals" (World Health Organization, 2010, p.7).

COVID-19: "The infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. COVID-19 is now a pandemic affecting many countries globally" (World Health Organization, 2020b, para. 2).

Critical Incident Technique (CIT): A research methodology that was developed in the 1950s and uses direct observations of human behavior to solve practical problems. In it, research participants are asked to recall and describe a time when the phenomenon of interest (or "incident") occurred (Flanagan, 1954).

Evidence-Based Practice (EBP): "The integration of individual clinical expertise with

the best available external clinical evidence from systematic research and [the] patient's unique values and circumstances" (Straus, 2011, p. 270).

Health Professionals: "Maintain health in humans through the application of the principles and procedures of evidence-based medicine and caring…study, diagnose, treat and prevent human illness, injury and other physical and mental impairments in accordance with the needs of the populations they serve…conduct research and improve or develop concepts, theories and operational methods to advance evidence-based health care" (World Health Organization, 2013, p. 57); health professions include but are not limited to counseling, dentistry, medicine, nursing, occupational therapy, optometry, pharmacy, physical therapy, physician assistant, and speech language pathology.

Health Sciences Educator: Clinical, instructional, and research faculty and staff at accredited academic institutions which train and graduate health professionals, in fields including but not limited to counseling, dentistry, medicine, nursing, occupational therapy, optometry, pharmacy, physical therapy, physician assistant, and speech language pathology.

Health Sciences Librarians: "Information professionals, librarians, or informaticists who have special knowledge in quality health information resources" (Medical Library Association, n.d., para. 2); they typically have been awarded a master of library science and/or information science from an American Library Association-accredited institution. This term is often used interchangeably with "medical librarians."

Health Sciences Libraries: Provide for the information needs of health professional students, faculty, practitioners, and staff, through both collections (journals, books, other materials) and services (instruction, research support, mediated literature searching, etc.).

This term is often used interchangeably with “medical libraries.”

Interprofessional Education (IPE): “Occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes” (World Health Organization, 2010, p. 7).

Purposive Sampling: A sampling method in which an expert applies their “knowledge of the population to select in a nonrandom manner a sample of elements that represents a cross-section of the population” (Battaglia, 2008, p. 645).

Thematic Analysis: “Thematic analysis is a systematic approach to the analysis of qualitative data that involves identifying themes or patterns of cultural meaning; coding and classifying data, usually textual, according to themes; and interpreting the resulting thematic structures by seeking commonalities, relationships, overarching patterns, theoretical constructs, or explanatory principles” (Lapadat, 2012, p. 926).

Limitations of the Study

This study explored attitudes and experiences of educators with non-clinician facilitators of online IPE activities, particularly health sciences librarians, and included participants from the state of Texas. As such, it was not representative of other geographic regions and the diversity of the pool of participants was not generalizable to the larger population of IPE educators worldwide. The lack of a second coder detracted from the study’s reliability. Additionally, the focus on attitudes and experiences rather than outcomes assessment means this study serves as a starting point to inform future research in that area.

Summary

Interprofessional education is an important endeavor in health sciences education.

As the field experienced a major shift from in-person to online formats due to the COVID-19 pandemic, IPE activities also needed to transition. Despite their relevant experience in health sciences education, particularly in online settings, librarians have typically not had much involvement in IPE. More involvement from librarians, particularly in online settings, could help to increase the adoption of IPE. This study explored attitudes and experiences of health sciences educators with non-clinician facilitators of online IPE activities, particularly health sciences librarians. Chapter II contains a review of the relevant research literature on IPE including librarian and library involvement, IPE's provision in online settings, and this study's methodological factors.

Chapter II

Review of the Literature

Health sciences education has experienced a major shift from primarily in-person to primarily online formats due to the COVID-19 pandemic. The provision of interprofessional education (IPE) has also needed to transition online. Librarians have the opportunity to contribute in this area due to their relevant experience in health sciences education and education in online settings. The purpose of this study was to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. This chapter explores the literature on IPE. It begins with an overview of IPE, then a discussion of library and librarian involvement in supporting IPE, serving as members of interprofessional teams, and providing space for IPE. Additionally, online settings for IPE are reviewed. This includes librarian involvement and the barriers to in-person IPE that online settings can help to overcome. Finally, there is an overview of the literature as it relates to the methodological factors of this study.

Interprofessional Education in the Health Sciences

IPE "occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes" (World Health Organization, 2010, p. 7). Proponents for this practice theorize that health sciences students who take part in IPE will be better prepared for collaborative practice than students who do not. It is posited that "interprofessional collaborative practice is key to the safe, high-quality, accessible, patient-centered care desired by all" (Interprofessional

Education Collaborative, 2016, p. 4) and will lead to a strengthened health system and better outcomes for patients (World Health Organization, 2010). IPE as an educational method is student-centric and based in adult learning theory (Pfeifle & Blue, 2016). Several landmark reports from prestigious medical organizations have urged a remaking of the education system in support of widespread adoption of IPE. A selection is summarized here. WHO's Study Group on Multiprofessional Education of Health Personnel: The Team Approach met in 1987 to develop their report "Learning Together to Work Together for Health." It states that IPE is "a means of ensuring that different types of health personnel can work together to meet the health needs of the people" (p. 7). The detailed report provides a rationale for IPE as well as a deep-dive into its qualitative aspects and constraints, and instructions for launching an IPE program (World Health Organization, 1988). A decade later, the Pew Health Professions Commission published "Recreating Health Professional Practice for a New Century." One of its major recommendations was that all health professionals be required to show interdisciplinary competence. Medical and professional schools were encouraged to "fundamentally reassess their curricula to ensure that their programs embody and apply an interdisciplinary vision" (O'Neil & Pew Health Professions Commission, 1998, p. v). In 2004, NAM published a report entitled, "Health Professions Education: A Bridge to Quality." In it, they urged that students should be trained to work in interdisciplinary teams to improve the quality of healthcare (Greiner & Knebel, 2004). Then, in 2010, WHO published "Framework for Action on Interprofessional Education and Collaborative Practice" which called for health policy makers to take action to implement IPE and reduce the fragmentation and professional silos present in healthcare (World

Health Organization, 2010). That same year, a report from The Lancet's Global Commission on Education of Health Professionals for the 21st Century was published, entitled "Health Professionals for a New Century: Transforming Education to Strengthen Health Systems in an Interdependent World." It also highlighted the need for team-based learning leading to a prioritization of teamwork in healthcare, bringing out the most of the skills of each health profession (Frenk et al., 2010).

These reports have had an impact on the adoption of IPE by educational institutions. Accrediting bodies for dentistry, medicine, nursing, occupational therapy, pharmacy, physical therapy, physician assistant, and public health programs all included standards related to IPE as of 2013 (Zorek & Raehl, 2013). IPE has also been a popular topic for educational research across the health professions in recent years. A 2019 review found that medicine, nursing, pharmacy, dentistry, occupational therapy, and physical therapy are the top disciplines contributing to the IPE literature (Islam et al., 2019). The literature shows that the most-reported IPE methods are simulations and experiential training, although more passive activities such as case discussions and presentations are utilized by some programs (Fox et al., 2018).

While there is agreement that IPE is valuable, accreditation requires it, and there is much literature devoted to its implementation, it has not been adopted ubiquitously. This is likely due to the many barriers and obstacles standing in the way. IPE presents a number of logistical challenges (Black et al., 2016) in that it requires space, faculty time (Dow, Alan et al., 2016), and the alignment of diverse student schedules (Dow, A. W. et al., 2016). COVID-19 and the need for social distancing added a new barrier which has required innovation to overcome (American Association of Colleges of Nursing, 2020;

Interprofessional Education Collaborative, 2020; National Center for Interprofessional Practice and Education, 2020; Texas IPE Consortium, n.d.).

Librarian Involvement in In-Person IPE

There may also be barriers to direct librarian involvement in traditional in-person IPE, as there is limited documentation of this in the literature. The reported-on examples are split between medical and medical librarian journals, and include various formats and levels of librarian involvement. In Ireland, librarians served as planners (but not facilitators) of an IPE module that used a problem-based learning format. The module took place over the course of two semesters and included students from four disciplines. The content covered included library information skills (Cusack & O'Donoghue, 2012). Another workshop was unique in that it was aimed at interprofessional EBP training of faculty – a train-the-trainer format. The authors provided the rationale that "since faculty often practice in interprofessional teams, it seems logical they would learn EBP in an interprofessional setting" (Koffel & Reidt, 2015, p. 367). The workshop was designed and facilitated by a health sciences librarian. Results from the participants' evaluations indicated success (Koffel & Reidt, 2015).

Perhaps unsurprisingly, there are multiple reports of librarians planning interprofessional book clubs. At Quinnipiac University in Connecticut, librarians initiated a pilot book club program in an attempt to promote interprofessional communication. They chose recreational yet health-focused titles and invited pairs of speakers from different professions to share about their own reactions to the books. The lunch-time events also included question-and-answer sessions and small interdisciplinary group discussions. Feedback was positive, and "the library was able to create an inviting,

inclusive, and informal learning community resulting in a safe space for communicating interprofessionally" (Kilham & Griffiths, 2017, p. 47). At another institution, librarians worked together with health professions faculty to design and implement an interprofessional book club discussion for incoming health professions students. The planners hypothesized that this early exposure could set the institution's cultural tone as one where IPE is the norm. The book discussions took place in small groups with faculty facilitators, and included representation from seven health professions. Survey results showed positive changes in IPE knowledge and attitudes (Haley et al., 2019).

In 2016, the Medical Library Association published a book entitled "Interprofessional Education and Medical Libraries: Partnering for Success." The book largely functions as an introduction to IPE, including chapters on its history and theoretical underpinnings (Edwards, 2016). However, there are two chapters which directly address and provide examples of library and librarian involvement in IPE. Chapter Five is focused on the experience of University of Utah. At that institution, the health sciences library was approached and asked to lead IPE initiatives at the university. This was because the library was viewed as neutral and had existing partnerships with all health sciences programs. Subsequently library directors led the program for its first ten years. When the program was expanded to multiple events per year and increased its focus on simulation, a non-librarian, dedicated director for IPE was hired (Shipman et al., 2016). The library is still involved in the IPE program at University of Utah, and the book chapter urges library involvement in IPE programs everywhere, "as this entity can help to reach out to known individuals and to coordinate committee activities and document their progress with technological support and organizational skills" (Shipman et al., 2016, p.

72).

Chapter Eight of "Interprofessional Education and Medical Libraries: Partnering for Success" further highlights library and librarian involvement in IPE. It includes examples from grey literature, including conference presentations and posters. Librarians in Ohio were integral to an EBP-based IPE course for medical and pharmacy students, even grading parts of the assignment, while librarians in Florida served as facilitators of interprofessional small groups learning to provide longitudinal non-clinical care to families. Other universities have librarian representation on campus IPE committees or task forces, providing administrative leadership for the groups. Further examples of librarian involvement in IPE include planning and support for an interprofessional book club, basic life support event, and information literacy course. Additionally, many libraries have taken a more passive role in supporting IPE by creating web-based information guides on the topic, and making sure their libraries subscribe to journals and purchase books on IPE (Young et al., 2016).

Librarians as Members of Interprofessional Teams

Librarians do not just support in-person IPE activities; they also take part in interprofessional activities. While interprofessional teams are typically thought of as being made up of clinical professionals, such as physicians, nurses, and pharmacists, among others, there are examples in the health sciences education literature of librarianship being considered one of the professions on an interprofessional team. This concept is not new. Clinical medical librarians have been involved in rounding since at least the 1970s, and they often round as members of interprofessional clinical teams. The librarian's role on these teams is usually to recognize information needs and provide

evidence to support clinical decision-making (Travis & Bickett, 2016).

Another significant example of librarians serving as accepted members of interprofessional teams comes from the Interprofessional Education Collaborative (IPEC). In its "Core Competencies for Interprofessional Collaborative Practice: 2016 Update," IPEC lists library science as one of the professions to have participated on their Faculty Development Institute teams (Interprofessional Education Collaborative, 2016). Further evidence of the legitimacy of this role for librarians has been provided in published reports of individual projects within academia; it appears that there may be more room for librarians to be included on interprofessional teams in educational settings where having a clinical role is not a necessity. Librarians who worked with an interprofessional collaborative team to develop new curriculum for medical students found that it allowed them "to move beyond the traditional role of instruction and toward a partnership with course directors" (Butera et al., 2014, p. 299). At another institution, librarians have been able to "act as a bridge" (p. 337) between different programs' curriculum committees (Hackman et al., 2017). A group of librarians who worked as part of a team to plan an IPE book club for incoming health professions students acknowledged their role as models of shared leadership and teamwork to the students. They also felt that it gave them the chance to display their skillset to their faculty colleagues (Haley et al., 2019). Librarians who worked with an interprofessional team of faculty to develop an IPE activity based around a clinical case found new opportunities for networking and scholarly activity (Hanson et al., 2017). A separate group of librarians who worked on an IPE project planning team pointed out that they "are natural partners in IPE because they have experience engaging institutional stakeholders in different

schools and departments" (Aronoff et al., 2017, p. 377).

These examples from the literature show a growing consideration of librarians as members of interprofessional healthcare and/or education teams. This is an indication of the valuable contribution that librarians can make at their institutions.

Library Space in Support of IPE

Librarians and libraries can both support IPE, the latter by providing much needed space. Libraries have often been cited as one of the few inclusive and widely accessible spaces on academic campuses. Libraries have been described as "a commonality between programs and … interprofessional in nature" (Kilham & Griffiths, 2017, pp. 42-43) and "the only collaborative space on campus that is open to students from all programs, as well as faculty, staff, and campus visitors" (Young, L. M. et al., 2015, p. 447). It has also been noted that their "social acceptance provides the perfect platform to support the development of team centric inter-professional education" (Legerton, 2013, p. 61). IPE, as it has traditionally been conducted, requires space. It often involves large numbers of students coming together to break into smaller groups and take part in simulations, discussions, or other in-person activities. In order to facilitate and encourage IPE, faculty and administrators may need to look beyond their own departments' siloed spaces and find locations that are accessible and welcoming to all. Libraries can fill that need. As such, providing physical space is one area in which libraries have become involved in the provision of IPE. This can occur directly when libraries hold IPE activities within their walls (Young, L. M. et al., 2015), or indirectly when libraries purposely create an environment conducive to serendipitous interprofessional interactions (Legerton, 2013).

Moving beyond the challenge of finding a space in which to hold IPE activities,

the case has been made for academic institutions to systematically re-think the design of their physical spaces in service of IPE. In 2013, Nordquist et al. described the need to remake campuses from their current highly professionally siloed designs into flexible spaces emphasizing “interaction and collaboration” (p. 3). They also set forth libraries as an example of a type of academic space which has successfully transitioned from the old era of facilities design to the new. Where previously they merely stored collections of research materials, libraries are now a modern gathering space and site for students’ informal learning (Nordquist et al., 2013). It has also been proposed that anatomical sciences education should occur in specially-designed IPE-friendly facilities which include laboratories, flexible classrooms and meeting spaces, and advanced collaborative technology (Cleveland & Kvan, 2015). It may behoove those institutions which are currently professionally siloed yet do not have a physical facilities overhaul in their near future to look to their existing spaces, such as the library, for IPE-friendly options.

Libraries can also take an active role at institutions where construction and re-designs are possible. In 2016, the University of North Dakota’s School of Medicine and Health Sciences opened a new building that was designed with interprofessional education and collaboration in mind. Groups of students from different professions now shared physical learning community spaces, and faculty and staff were located in interdisciplinary suites. This change necessitated moving the librarians out of the library and into offices co-located with their assigned departments (Hackman et al., 2017). At the University of Mississippi Medical Center, a large-scale campus pivot toward IPE prompted the library to dedicate and redesign a space to be used for both formal IPE events and by informal interprofessional student groups (Young, L. M. et al., 2015). An

Australian university added a modern extension to its existing library space, designed to be the "home from home" (p. 61) for students from a wide variety of professions, providing opportunities for interactions between students who may not have otherwise met (Legerton, 2013). The goal was to, in turn, "increase inter-professional recognition and mutual understanding" (p. 61). Libraries in their physical form can clearly be a place where IPE occurs and new multidisciplinary relationships are forged.

Online IPE

IPE has typically required space because it has included groups of students in close physical proximity taking part in clinical simulations and experiential training (Fox et al., 2018). However, the literature does contain some examples of online IPE activities. The Lancet's Global Independent Commission on Education of Health Professionals for the 21st Century laid the theoretical groundwork for such endeavors with its 2010 report, "Health Professionals for a New Century: Transforming Education to Strengthen Health Systems in an Interdependent World" (Frenk et al., 2010). It was posited in this report that information technology's power for learning should be exploited (p. 1924). While acknowledging the limitations inherent in the digital divide, the authors predicted that e-learning was "likely to be revolutionary" (p. 1944) and described the many ways that information technology can transform health professions education, including hybrid courses, fully online courses, distance learning, open educational resources, and global academic consortia (Frenk et al., 2010). It may be appropriate for this online revolution in education to extend to IPE. A research study examining the deeper meaning of the definition of IPE found that students, new graduates, and faculty members did not strongly agree that learning *with* others "requires students being in the same place at the

same time" (Bainbridge & Wood, 2012, p. 455). This finding supports the appropriateness of online settings for IPE.

Along with this momentum for online education, there are several examples in the last decade of educators piloting IPE activities in virtual formats. New York University developed a five-part hybrid program entitled NYU3T: Teaching, Technology, Teamwork. It began with an in-person lecture, assignment of interprofessional teams, and a team building activity. The next step was online learning modules which were completed asynchronously. They included didactic content and exercises that were completed on an individual basis, as well as collaborative reflections that exposed the students to their interprofessional colleagues' points of view. Next was an in-person observation with a clinician from another profession, followed by a four-week virtual patient simulation in which students developed an interprofessional care plan. Finally, the teams came together in person and completed a high-fidelity simulation. The educators discussed the benefits of the student-directed nature of the online learning modules (Djukic et al., 2012). A project out of Michigan brought together physician assistant, physical therapy, and occupational therapy students to use online virtual patient software and write a comprehensive treatment plan. This self-directed learning experience also included reflections. The authors found that their learning objectives were met (Shoemaker et al., 2014). A year later, some of the same researchers conducted a randomized trial with a control group and survey instrument based on the IPEC competencies (Interprofessional Education Collaborative, 2011) and the Readiness for Interprofessional Learning Scale (Parsell & Bligh, 1999; Shoemaker et al., 2015). They used the same software as in the previous study with teams of pharmacy, physician

assistant, and physical therapy students. They stated that their "results provide quantitative confirmation that virtual case-based IPE activities result in students having a greater awareness of other professions' scopes of practice, what other professions have to offer a given patient, and how different professions can collaborate in patient care" (p. 396). A study in Boston utilized virtual world technology in the form of Second Life for an IPE activity in palliative care. The researchers "found that students were able to develop a sense of interprofessional teamwork and to value that team through virtual interaction alone" (Lee et al., 2020, p. 469). The results of these online pilots all suggest that this is an effective format for IPE.

Many IPE activities build skills for interprofessional care based in acute settings. Educators at Virginia Commonwealth University found virtual IPE an ideal format for preparing students for a different kind of interprofessional care: that which takes place in a non-urgent setting. While the former type of care is collaborative, the latter, which occurs in settings such as primary care, is coordinative. Coordinative care is often facilitated via communication in electronic health records (EHRs), making online, EHR-based IPE activities ideal for building skills in this area. The study team built a web-based case system which resembled an EHR, and assigned interprofessional teams of students to coordinate care for a simulated patient over the course of six weeks, which represented a period of seven years in the patient's life. They found that teams with higher levels of engagement in the online environment scored higher on knowledge and performance assessments. Interestingly, an in-person orientation was added to the second iteration of this program; however, there was no difference in scores between iterations (Dow, A. W. et al., 2016).

Librarian Involvement in Online IPE

There are also a few examples of direct librarian involvement in online IPE programs. An IPE activity in Nebraska included students from diagnostic medical sonography and medical nutrition education programs. The three-part intervention began with online library modules delivered around a case-based scenario. The other two sessions took place in person and focused on fetal growth assessment and nutrition during pregnancy, respectively. While the library skills portion of the activity was completed independently and was cited by students as being less beneficial than the other parts, it laid the foundation for the rest of the more traditional IPE content. The activity as a whole was deemed to be successful in helping students meet interprofessional competencies, and librarians were an integral part of the planning team (Hanson et al., 2017). In a similar vein, a pilot project in Buffalo, New York had students from eight health professions complete librarian and instructional designer-created online learning modules on EBP. The modules served as preparation for an in person case-based IPE activity. Assessments showed that the students gained EBP knowledge as well as developed interprofessional teamwork and communication skills (Aronoff et al., 2017; Ohtake et al., 2018). The researchers found that "providing consistent EBP knowledge and skills education to all health professions students afforded a similar baseline prior to participating in the in-person interprofessional learning experience" (Aronoff et al., 2017, p. 382).

Another online IPE program which included strong librarian involvement was unique in that the recipients were practicing professionals rather than students. The ECHO Ontario Chronic Pain/Opioid Stewardship program used telehealth technologies

and a hub-and-spoke model to educate and provide mentorship for members from nine health professions. A librarian was a member of the hub team and primarily addressed information gaps that arose from the tele-sessions. The librarian's skills were highly utilized and valued by the program members. This example highlights that IPE does not end at graduation; it can also play a role in continuing medical education (Babineau et al., 2018).

Barriers and Obstacles to In-Person IPE

Most of the literature describing online IPE, with or without librarian involvement, mentions the barriers and obstacles to in-person IPE. These include a lack of support from leadership, lack of faculty and monetary resources, difficulties with scheduling students from different programs and aligning varying curricular schedules, difficulties with finding appropriate space (Djukic et al., 2012; Dow, A. W. et al., 2016; Lee et al., 2020; Shoemaker et al., 2014; Shoemaker et al., 2015), "logistical challenges" (Aronoff et al., 2017, p. 378), and "overcoming traditional professional boundaries" (Shoemaker et al., 2015, p. 395). Similarly, an examination of the different IPE approaches and settings available described the online format as "emerging as a flexible approach to IPE with fewer time and space barriers to participation by students from multiple schools" (McDonough & Zierler, 2016, p. 109). These sources support the idea that using an online format is an appropriate and effective way to begin to overcome the barriers and obstacles to in-person IPE.

Methodological Factors

This study explored educator attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. This was

accomplished using questionnaire research adapted from Critical Incident Technique (CIT) (Flanagan, 1954). For this study, a questionnaire was chosen over other formats in order to feasibly reach a variety of participants throughout the state of Texas and to improve the study's reliability and validity. Surveys or questionnaires are a commonly-used methodology for measuring attitudes. There is an "Attitude Measurement" entry in the "Encyclopedia of Survey Research Methods" which states that "researchers from a variety of disciplines use survey questionnaires to measure attitudes" (p. 38). It goes on to examine the formats appropriate for attitude measurement, including question format and multi-item scales (Maitland, 2011). CIT was developed in the 1950s. It uses direct observations of human behavior to solve practical problems (Flanagan, 1954, p. 327) and is considered a flexible technique that should be adapted to the situation at hand. While this type of research is often conducted in the form of interviews, questionnaires are also regarded as an appropriate medium for data collection (Flanagan, 1954). A recent examination of CIT in health services research concluded that CIT is an appropriate methodology when the researcher wants to determine what factors help or hinder the activity being studied (Viergever, 2019). There are a variety of examples in the health sciences of CIT studies utilizing surveys and questionnaires (Kurotschka et al., 2021; Kyriacos et al., 2005; Tenopir et al., 2004), as well as CIT studies examining aspects of IPE (Graybill et al., 2017; Robson, M. & Kitchen, 2007).

Survey research has regularly been used to explore educator attitudes. In fact, there are several recent examples of the use of surveys to assess faculty attitudes toward IPE (Giordano et al., 2012; Moyce et al., 2017; Olenick & Allen, 2013; Vernon et al., 2018). Some of them used validated scales, such as the Interdisciplinary Education

Perception Scale (Hawk et al., 2002) or the Readiness for Interprofessional Learning Scale (Parsell & Bligh, 1999), while others used novel questionnaires geared toward the specific population and situation being studied. Additionally, Flanagan highlighted the potential for CIT to be used to study attitudes, motivation, and leadership (1954). A health sciences example of this approach is a 2011 study which identified the attitudes of dietitians toward mental health (Dowding et al., 2011).

While there are existing validated instruments measuring librarian and faculty attitudes on a variety of topics, there is none which has been developed using CIT to measure educator attitudes toward health sciences librarians as facilitators of online IPE activities. The most relevant attitudes measurement scale appeared in a 1990 study at California State University, Long Beach which examined faculty attitudes toward and use of the library. This 21-item survey focused on the faculty's use of the library, how they expected their students to learn library skills, their level of collaboration with the library, and experience with searching electronic databases – a new concept at the time (Thomas, 1994). A tangentially-related study occurred in 2004, when researchers used CIT to analyze the changes over time in medical faculty's use of print and electronic journals (Tenopir et al., 2004).

Due to the lack of an existing relevant tool, a novel questionnaire utilizing CIT and informed by the content and design of the instruments discussed in this review was developed for use in this study.

Summary

The literature clearly shows that there is an opportunity for growth in librarian and library involvement in IPE, as well as for IPE in online settings. A 2013 review of

the literature on evidence-based medicine training in undergraduate medical education found that only a small percentage of interventions took place in online environments. Only one intervention included interprofessional learners. While several included interprofessional teaching teams, only a small percentage included a librarian as co-teacher (Maggio et al., 2013). The educational environment is ideally situated for librarians to increase their involvement in IPE. Generally, this research examined what factors help and hinder the provision of IPE, particularly as they relate to facilitators. Specifically, this study used a questionnaire based on CIT to explore educator attitudes toward and experiences with non-clinicians, and health sciences librarians in particular, as facilitators of online IPE activities. Chapter III describes in further detail the methodology used in this study.

Chapter III

Methodology

The purpose of this study was to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. This was carried out via a qualitative study utilizing a novel questionnaire consisting of multiple-choice and free-text questions grounded in CIT. This chapter describes in detail the methodology used in this study. It includes a description of the research questions, variables, and measures. Additionally, it describes the participants and the procedures for data collection and analysis.

Research Questions

The following research questions guided this study:

1. What knowledge, skills, and abilities do health sciences educators deem necessary for facilitators of IPE activities?
2. What are health sciences educators' experiences with and attitudes toward non-clinician facilitators of IPE activities?
3. What are health sciences educators' experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities?
4. How do these factors differ for in-person as compared to online settings?

Operational Definitions

Definitions related to the methodology of this study are included in this section.

Critical Incident Technique (CIT): A research methodology that was developed in the 1950s and uses direct observations of human behavior to solve practical problems. In it,

research participants are asked to recall and describe a time when the phenomenon of interest (or "incident") occurred (Flanagan, 1954).

Purposive Sampling: A sampling method in which an expert applies their "knowledge of the population to select in a nonrandom manner a sample of elements that represents a cross-section of the population" (Battaglia, 2008, p. 645).

Thematic Analysis: "Thematic analysis is a systematic approach to the analysis of qualitative data that involves identifying themes or patterns of cultural meaning; coding and classifying data, usually textual, according to themes; and interpreting the resulting thematic structures by seeking commonalities, relationships, overarching patterns, theoretical constructs, or explanatory principles" (Lapadat, 2012, p. 926).

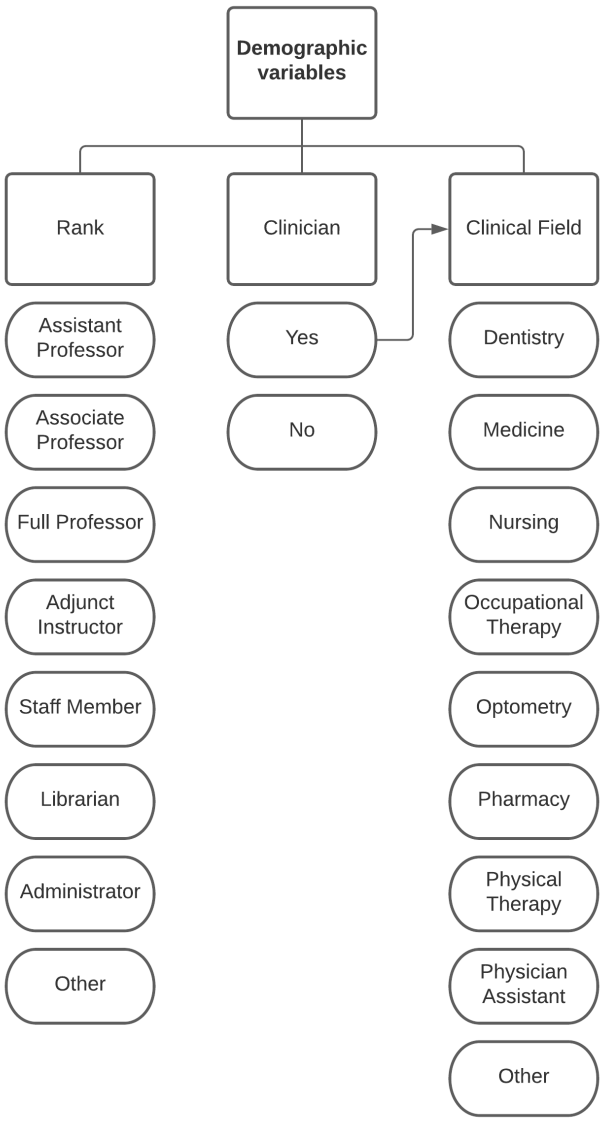
Measures

This study's categorical and ordinal variables were measured using a novel questionnaire designed to collect data which addressed the posed research questions. A questionnaire was chosen over other forms of data collection in order to feasibly reach a variety of participants throughout the state of Texas and to improve the study's reliability and validity. The questionnaire consisted of 24 questions; four of the questions included two parts. There were 13 multiple-choice and 11 free-text entry questions. The multiple-choice and free-text entry questions were interspersed throughout the questionnaire. The online questionnaire software automatically advanced participants past irrelevant questions based on their answers. For example, participants who indicated they were not clinicians were not shown the question asking in which clinical field they specialize. Because of this, each participant who completed the questionnaire was presented with 15 to 24 questions.

The categorical and ordinal data were collected via multiple-choice questions. There were three multiple-choice questions which captured demographic data, including rank, whether the participant was a clinician, and if so, their clinical field. Figure 3 provides a visual representation of the demographic variables.

Figure 3

Demographic Variables

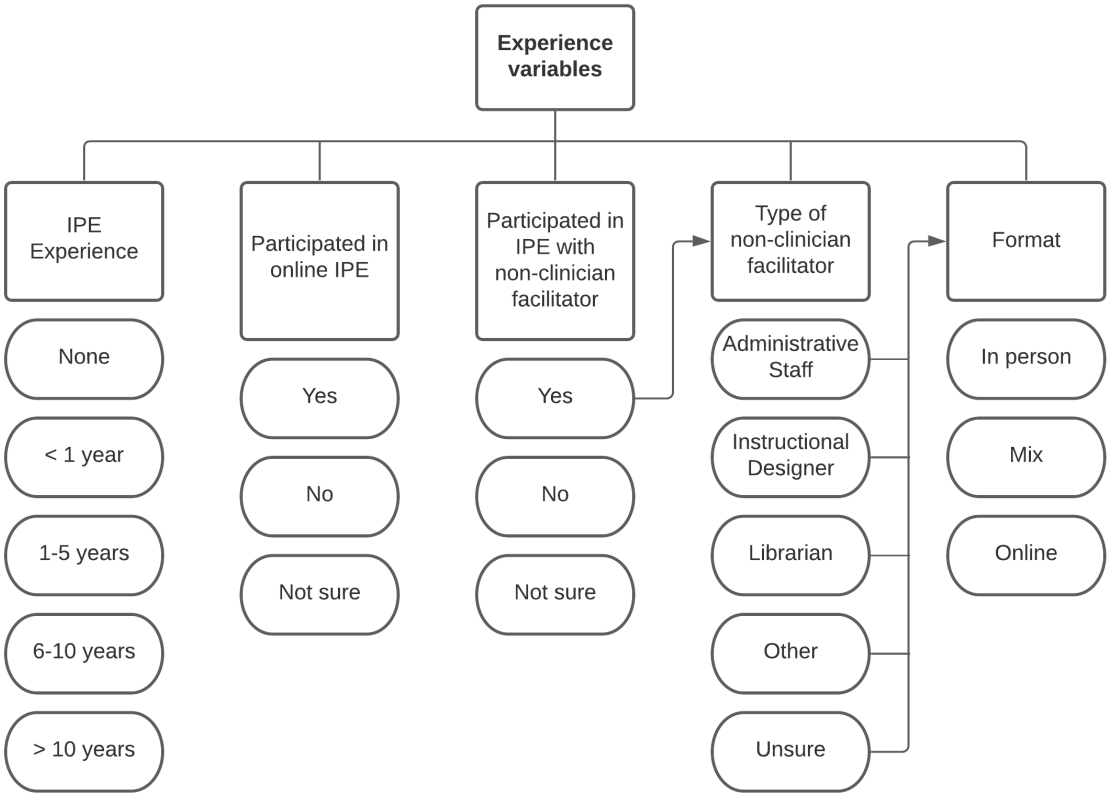


Five multiple-choice questions examined participants' IPE experience. This included one question asking their length of experience with IPE and another question

assessing if the participant had any experience with online IPE. Additionally, there was a question asking if the participant had any experience with non-clinician facilitators of IPE, and if so, the type of non-clinician facilitator involved and the format of the experience. Figure 4 provides a visual representation of the experience variables.

Figure 4

Experience Variables

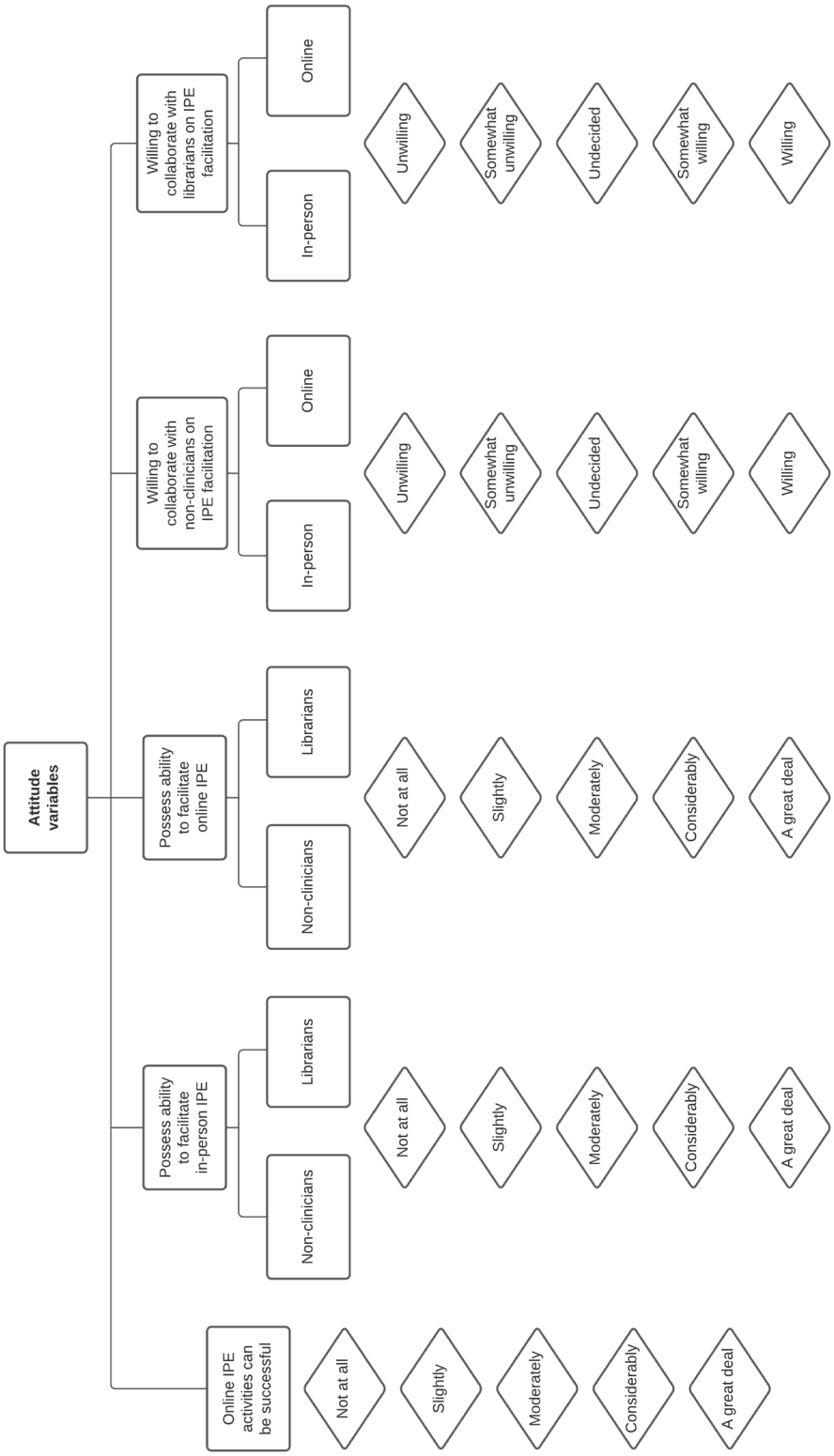


The remaining five multiple-choice questions examined participants' attitudes using five-point Likert scales. One question asked participants if they thought online IPE activities can be successful. The answer choices ranged from "Not at all" to "A great deal." The four additional attitude-measuring questions also used five-point Likert scales, and each consisted of two parts. They were designed to measure participants' attitudes toward non-clinician IPE facilitators. Specifically, two of the questions asked participants

if they thought non-clinicians, and librarians in particular, possess the ability to facilitate in-person IPE. The answer choices ranged from “Not at all” to “A great deal.” The other two questions asked if participants were willing to collaborate with non-clinicians, and librarians in particular, on IPE facilitation in in-person and online formats. The answer choices ranged from “Unwilling” to “Willing.” Figure 5 provides a visual representation of the attitude variables, including their five-point Likert scale response options.

Figure 5

Attitudes Toward Online IPE and Non-Clinician Facilitators

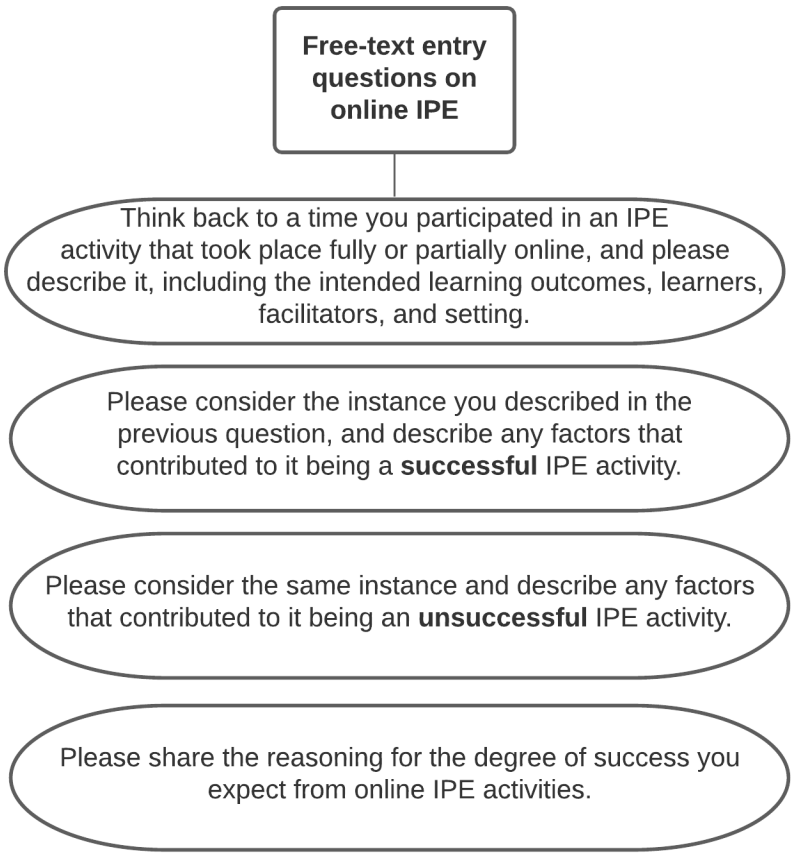


The remaining data were collected via free-text entry questions. Some of the free-text entry questions used in the questionnaire were adapted from CIT, a methodology that was developed in the 1950s. This methodology uses direct observations of human behavior to solve practical problems (Flanagan, 1954, p. 327), and is considered a flexible technique that should be adapted to the situation at hand. A key feature of CIT is asking research participants to recall and describe a time when the phenomenon of interest occurred. This occurrence of the phenomenon of interest is the "incident." Framing the question in this way is intended to improve recall and provide more specific and relevant data. While CIT research is often conducted in the form of interviews, questionnaires are also regarded as an appropriate medium for data collection (Flanagan, 1954). CIT can be used as a methodology to determine what factors help or hinder a particular activity (Viergever, 2019).

In this questionnaire, there was one block of three free-text entry questions that were only answered by study participants who indicated that they have participated in an online IPE activity. The participants were asked to recall a time when this occurred and provide answers to the three questions based on that particular incident. The remaining free-text entry question on the topic of online IPE directly asked research participants to share their reasoning for the degree to which they felt online IPE activities can be successful. Figure 6 provides a complete listing of free-text entry questions related to online IPE.

Figure 6

Free-Text Entry Questions on Online IPE



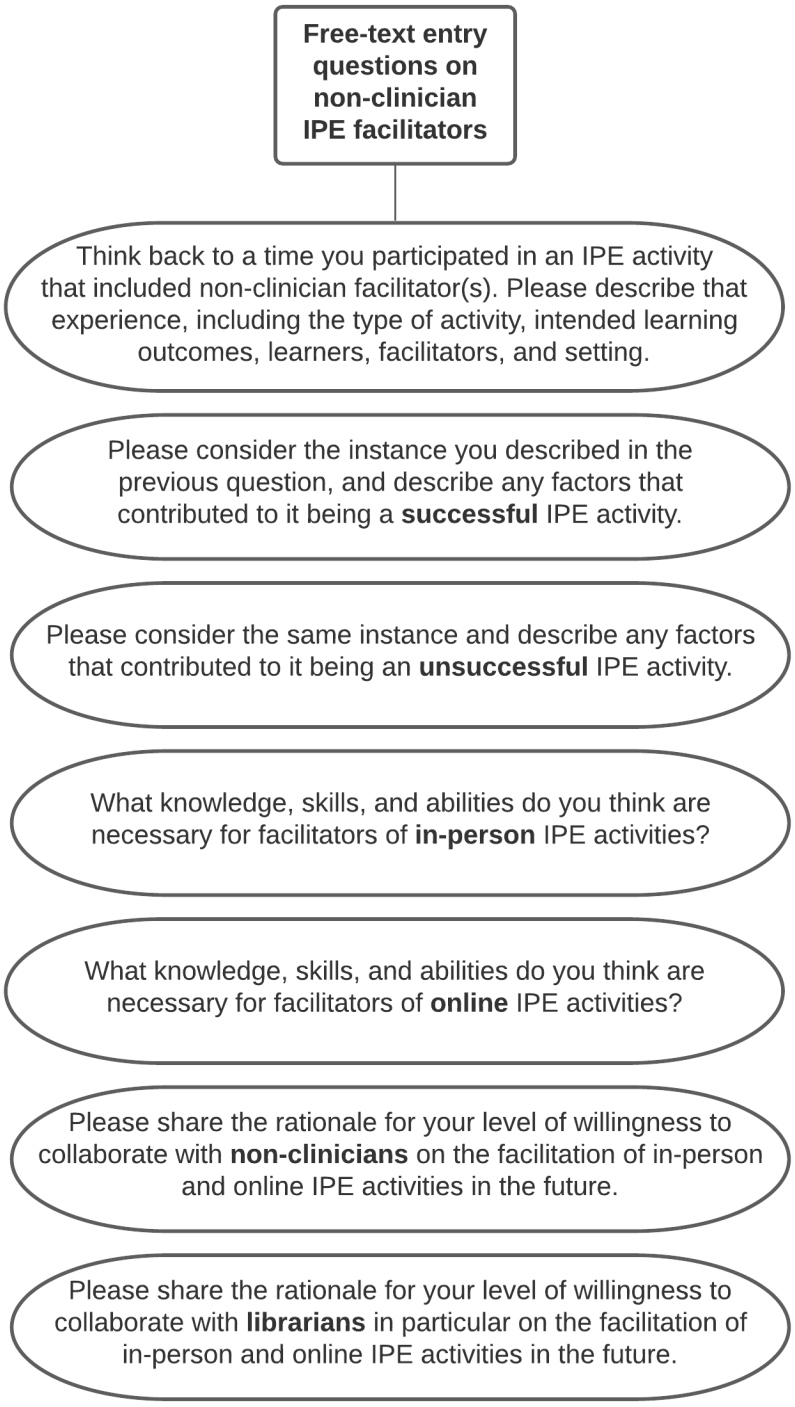
CIT was again used in this questionnaire to examine participants' experiences with non-clinician facilitators of IPE. The participants were asked to recall a time when they participated in an IPE activity that included non-clinician facilitators, and then share more about that experience.

In this section of the study focused on non-clinician IPE facilitators, CIT technique was utilized to identify what general factors, and what characteristics of facilitators, are associated with successful IPE activities. This can also be stated as identifying what characteristics of facilitators help or hinder IPE. The remaining free-text entry questions in this section directly asked research participants about characteristics

needed by IPE facilitators, and the rationales behind their levels of willingness to collaborate with non-clinician IPE facilitators in the future. In line with the study's research questions, they addressed both in-person and online formats, as well as both non-clinicians in general and librarians in particular. The questions were ordered such that these questions appear subsequent to the questions that asked the participants to recall a time when they participated in IPE with non-clinician facilitators. This was to prime the participants to base their responses on any past relevant incidents they have experienced, taking further advantage of the CIT method. Figure 7 provides a complete listing of free-text entry questions related to non-clinician IPE facilitators.

Figure 7

Free-Text Entry Questions on Non-Clinician IPE Facilitators



Appendix A provides a figure delineating how the questionnaire questions

mapped to the research question(s) they addressed. The complete questionnaire including question flow is included in Appendix B.

Reliability and Validity

Reliability can be difficult to assess in qualitative studies which do not lend themselves to the standard formal tests of reliability used in quantitative research. However, Robson and McCartan suggested the ability to strengthen reliability by avoiding common pitfalls in data collection such as transcription errors (2016). In a similar vein, Silverman suggested "detailed data presentations" (p. 397) which avoid inferences in order to improve reliability (2017). In this study, the use of a questionnaire rather than interviews and its administration via online survey software captured the precise output of the research participants and precluded the possibility of transcription errors. Additionally, it has been suggested that an audit trail should be used to show others that the research has been carried out thoroughly, carefully, and honestly (Robson, C. & McCartan, 2016, p. 173). The data management plan in place for this study (Appendix C) provided such a trail.

Robson and McCartan (2016) also described six strategies to strengthen validity in qualitative research: prolonged involvement, triangulation, peer debriefing and support, member checking, negative case analysis, and audit trail. While not all of these strategies were relevant or feasible for this study, others were and thus were utilized. First was triangulation. Though it used a single questionnaire, this study did incorporate more than one method of data collection, with multiple choice as well as free-text entry questions used. This is referred to as data triangulation, and can help to overcome the bias inherent in using a single method of data collection. In this instance, collecting the

responses to Likert scale questions on the participants' attitudes toward non-clinician facilitators of IPE provided a structured response that was compared to the unstructured free-text entry responses. The two types of responses were checked for consistency and to assess the accuracy of coding the free text. For example, one of the Likert scale questions asked, "Please rate your willingness to collaborate with non-clinicians on the facilitation of in-person and online IPE activities in the future." Response choices consisted of "Unwilling," "Somewhat unwilling," "Undecided," "Somewhat willing," and "Willing." This was followed up by a free-text question that asked, "Please share the rationale for your level of willingness to collaborate with non-clinicians on the facilitation of in-person and online IPE activities in the future." The researcher checked the responses to these two questions to ensure that they logically matched for each participant; participants who chose "Unwilling" as their response to the multiple-choice question provided free-text responses in line with being unwilling, while participants who chose "Willing" as their response to the multiple-choice question provided free-text responses in line with being willing.

Next was peer debriefing and support. In the development of the questionnaire used in this study, feedback was solicited from several committee members as well as health sciences librarians who used their expertise and experience to assess the clarity of the questions as well as the face validity. In particular, they provided feedback as to whether the questionnaire questions matched the study's research questions. This feedback was crucial in developing a valid questionnaire.

Next, negative case analysis was conducted when analyzing the questionnaire responses. Any responses which appeared to be outliers were examined thoroughly to see

how they detracted from or contributed to any theories that rose out of the data. For example, only one participant chose “Unwilling” as their response to the question “Please rate your willingness to collaborate with librarians in particular on the facilitation of in-person and online IPE activities in the future.” This outlier was closely considered and informed the researcher’s recommendations outlined in Chapter V.

Finally, validity was supported by including a strong audit trail in this study. The data was securely collected via an online questionnaire, and was archived for examination by other researchers to confirm its accuracy and interpretation. Further details are available in the data management plan provided in Appendix C.

Research Design

Participants

The population for this study consisted of health sciences administrators, faculty, and staff in the state of Texas who were involved with IPE. Texas is the second largest state both geographically (United States Census Bureau, 2010) and in population (United States Census Bureau, 2019) and is home to the Texas Medical Center (Texas Medical Center, n.d.). The state is seeing rapid growth in the field of medicine, with one third of its 15 medical schools being founded in the last decade (Texas Medical Association, 2020). There are also a large number of allied health programs located in the state.

The study participant sample was primarily drawn from the subpopulation of members of the Texas Interprofessional Education Consortium (TX IPE). TX IPE was formed as the Texas Interprofessional Education Task Force in 2015 by leadership in academic health sciences centers located in the state of Texas to “foster cross-institutional collaboration in order to expand learning opportunities and reinforce value for IPE as a

critical aspect of health professions education" (Texas IPE Consortium, n.d., para. 1). Additionally, faculty and staff members of the Texas Educators Academies Collaborative for Health Professions-Southeast (TEACH-S) were contacted, as were participants at a virtual IPE summit that was sponsored by the University of Houston College of Medicine and promoted state-wide. It is likely that there was a high level of overlap between these three groups.

Characteristics of the Participants

There were 27 institutions listed as members of TX IPE in the consortium's directory at the time of data collection. These institutions were located within the state of Texas and included public and private academic health sciences centers, medical schools, research universities, and liberal arts universities. Within the 27 institutions, there were 131 individual members at the time of data collection who had created a profile with the organization in order to receive updates and attend programming. The individual members were largely made up of administrators, faculty, and staff in the health sciences and/or health professions at their institutions (Texas Interprofessional Education Consortium, n.d.).

The individual members of TX IPE were contacted via email with a link to the online questionnaire. The email was also shared with the TX IPE listserv and forwarded to faculty and staff involved in TEACH-S. Additionally, a link to the questionnaire was shared in the chat of a virtual IPE summit that was held during the data collection period and had been promoted throughout Texas. In addition to being readily available for email and/or chat contact, these individuals were chosen from the study population because of their demonstrated interest in IPE and involvement with the IPE community in the state

of Texas.

The aggregate demographics of the respondents were compared to the aggregate demographics of the TX IPE membership list to determine that they comprised a representative cross-section of the population. Demographics that could be gleaned from the TX IPE membership list included each member's status as a clinician and their clinical field. These were identified from the members' credentials included in the membership list. To check that the distribution of clinician to non-clinician could be generalized to the study population of TX IPE members, a one-sample chi-square test was conducted. The results indicated that the participants were representative of the population in terms of clinician status (χ^2 (df = 1) = 0.130, p = .718). In the TX IPE membership list, 67.94% were clinicians, while 70.97% of the participants were clinicians. A statistically significant one-sample chi-square test of the member list and participants' clinical field responses could not be completed due to the majority of categories having an expected frequency of less than five.

The participants in this study constituted a purposive sample, as the TX IPE members were targeted in a nonrandom manner to represent a cross-section of the larger population of educators involved with IPE in Texas.

Data Collection Procedures

The University of Houston Institutional Review Board reviewed this study and determined it was exempt on October 14, 2021. The approval letter is included in Appendix D and the Consent Form is included in Appendix E.

The data collection instrument was constructed and distributed via Qualtrics, a web-based survey application hosted by the University of Houston. The questionnaire

was opened and disseminated via email to the 131 individual members of TX IPE on October 18, 2021. Of the emails sent, 15 failed, resulting in 116 delivered emails. The questionnaire was sent to the TX IPE listserv, largely consisting of the same group of individuals, on October 22, 2021. The email was also forwarded to 34 faculty and staff members of TEACH-S on October 19, 2021. Additionally, it was shared in the chat of a virtual IPE summit held on November 1, 2021, with approximately 50 attendees. Reminder emails were sent to the 116 individual members of TX IPE with active email addresses on November 10, 2021. The questionnaire remained open for 30 days, closing on November 17, 2021. There were 48 responses, resulting in a response rate of 36.64% of the 131 individual TX IPE members. These responses were anonymous, and no compensation was provided for participation in the study.

Data Management

A plan for the management of data from this study was created using DMPTool (University of California Curation Center of the California Digital Library, n.d.). This helped to ensure that the research results were available and accessible after the study was completed while maintaining appropriate research ethics. See Appendix C for the complete data management plan.

Data Analysis Procedures

The categorical and ordinal data derived from multiple-choice questions in this study were analyzed via descriptive statistics. Frequency distributions for the categorical variables provided the lay of the land in regards to the relevant characteristics of the study population, such as rank and clinical field. Frequency distributions played the same role in describing the population in terms of the participants' past experiences with in-

person and online IPE, as well as experiences with non-clinicians/librarians as facilitators of IPE and how frequently those activities occurred in an online environment. These analyses were completed using SPSS software.

The majority of the data analysis in this study focused on the categorical data obtained from the CIT-based free-text entry questions. This was conducted via inductive thematic analysis principles. As this study was examining an emerging area, it was not appropriate to identify themes prior to data collection and analysis; inductive thematic analysis ensured the themes were grounded in and emerged from the data. This analysis was carried out using Microsoft Word. The process began with the researcher examining the text entered by participants and naming the story told by each participant as a whole. Next, the individual responses to each question were also named. After this, the researcher coded the responses line-by-line and pooled into themes the critical incidents; knowledge, skills, and abilities; and rationales identified. These themes were further organized under broader domains to create frameworks which were explored narratively. See Chapter IV for a full examination of the study results.

Summary

The purpose of this study was to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. This chapter described in detail the methodology of this study. It included a description of the research questions and variables. Particular time was spent on the measure created for this study, an online questionnaire consisting of both multiple-choice questions and free-text entry questions based on CIT methodology. Additionally,

it described the purposively-sampled participants and the procedures for data collection via the online Qualtrics questionnaire. Information on the methods for data analysis utilizing SPSS and thematic analysis via Microsoft Word was also included.

Librarians have the opportunity to increase their involvement in IPE, particularly as it transitions further to online modalities. The research methodology was designed to examine what factors help and hinder the provision of IPE, particularly as those factors relate to facilitators. Chapter IV examines in detail the results of the study.

Chapter IV

Discussion of Results

This study was intended to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. The qualitative study methodology comprised a novel questionnaire consisting of multiple-choice questions and free-text questions grounded in CIT. This chapter describes the results of the study. It begins with an examination of the demographic characteristics of the study participants and their experiences with IPE, then moves on to an in-depth discussion of online IPE, including perceptions and success factors. Next, it covers skills required for IPE facilitation, and success factors for and attitudes toward non-clinician IPE facilitators. Finally, there is a selection of representative and unique participant stories.

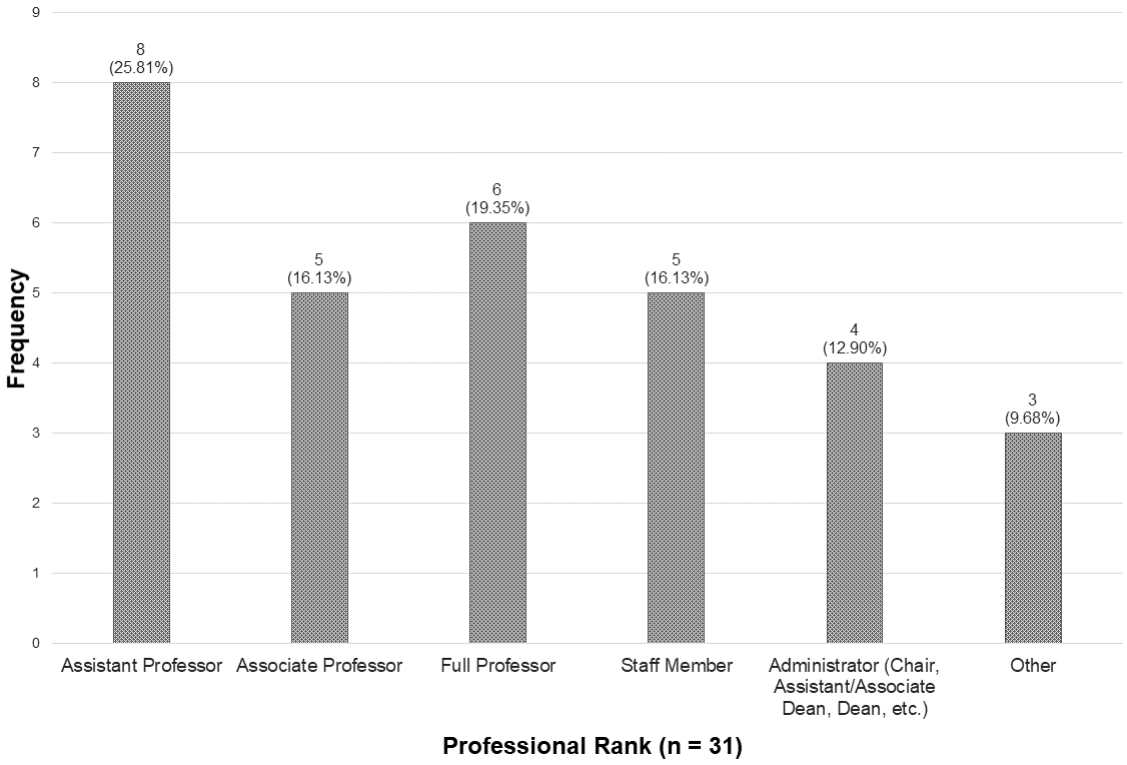
Results

Demographic Characteristics of Participants

The responses to the questionnaire's demographic items showed an experienced and diverse set of study participants. There were 48 participants in the study. The large majority (61.29%) reported a faculty status of assistant, associate, or full professor, with assistant professor being the most frequent response (25.81%). Figure 8 provides a frequency distribution of participants' professional ranks.

Figure 8

Professional Rank of Participants

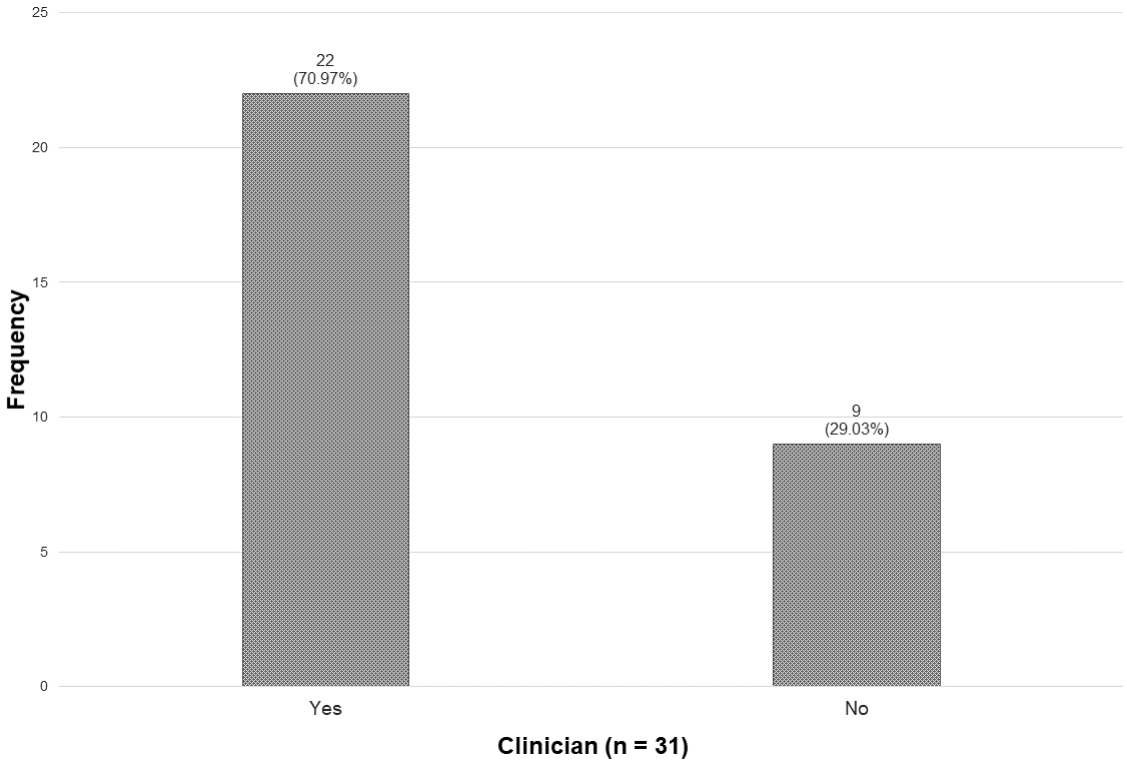


Note. Responses to question "Which of the following options most closely describes your rank?" "Other" responses included Director of Interprofessional Education & Practice (1; 3.23%), Healthcare Professional (1; 3.23%), and Practicum Coordinator/Clinical Instructor (1; 3.23%).

Over two-thirds (70.97%) of the participants reported being a practicing clinician, either currently or in the past. Figure 9 provides a frequency distribution of participants' clinician statuses.

Figure 9

Clinician Statuses of Participants

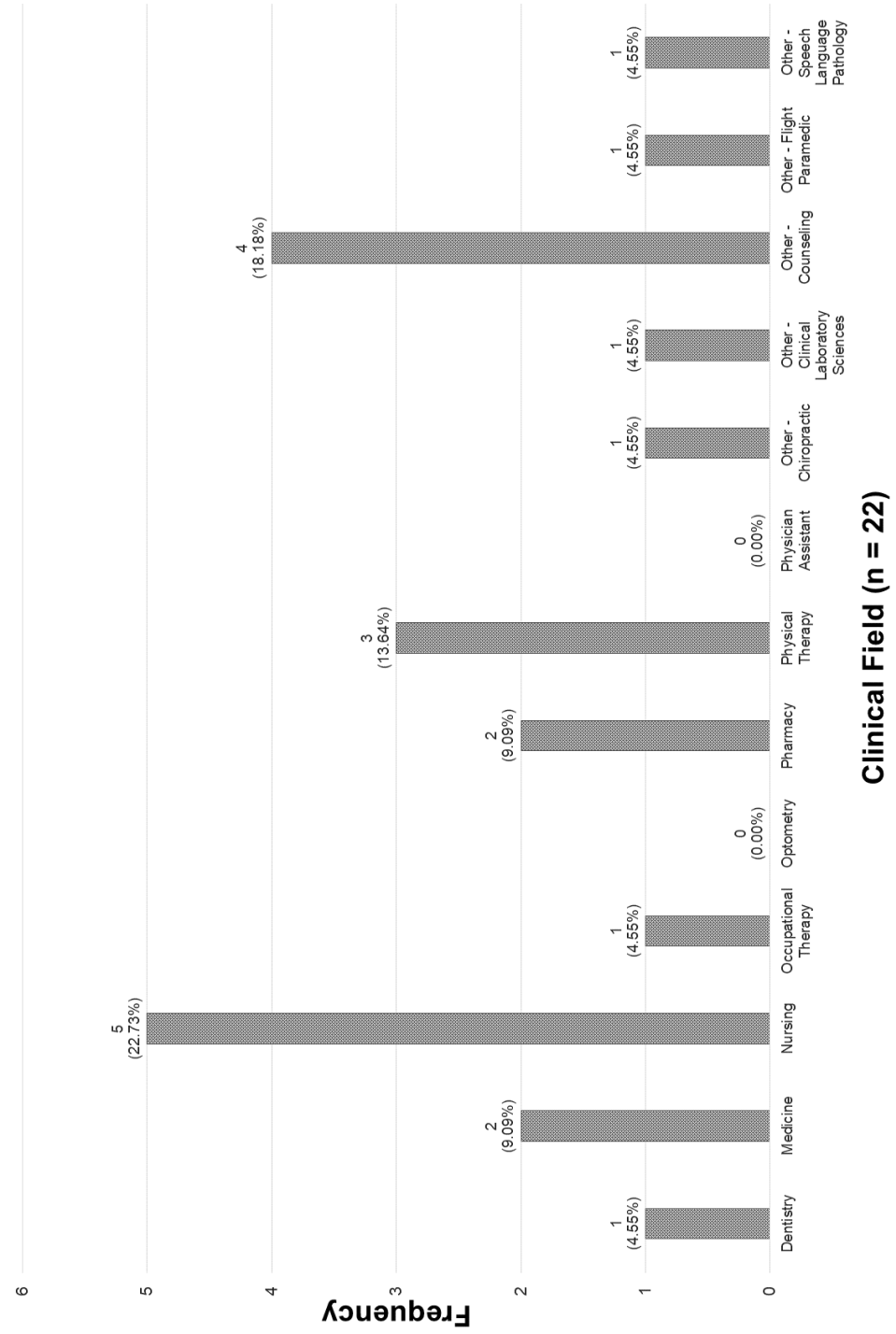


Note. Responses to question "Are you currently, or have you ever been, a practicing clinician (dentist, nurse, occupational therapist, optometrist, pharmacist, physical therapist, physician, physician assistant, etc.)?"

Among the clinicians, the most common clinical fields reported were Nursing (22.73%), Counseling (18.18%), and Physical Therapy (13.64%), with those three combined making up over half the responses (54.55%). Figure 10 provides a complete distribution of the frequency of participants' fields of clinical practice.

Figure 10

Participants' Fields of Clinical Practice



Note. Responses to question "In which clinical field did/do you primarily specialize?"

"Other – Counseling" responses include Behavioral Health (1; 4.55%), Counseling (2; 9.09%), and Mental Health (1; 4.55%).

Overall, participants in this study were likely to be faculty who were also clinicians in nursing, counseling, or physical therapy. It is notable that there was a low response rate for the demographic questions as compared to some later questions. For example, the first question on professional rank garnered 31 responses, while a later question on years of experience with IPE garnered 46 responses. It is possible that some participants refrained from answering these questions because they were concerned about the potential for re-identification based on demographics.

Participants' IPE Experiences

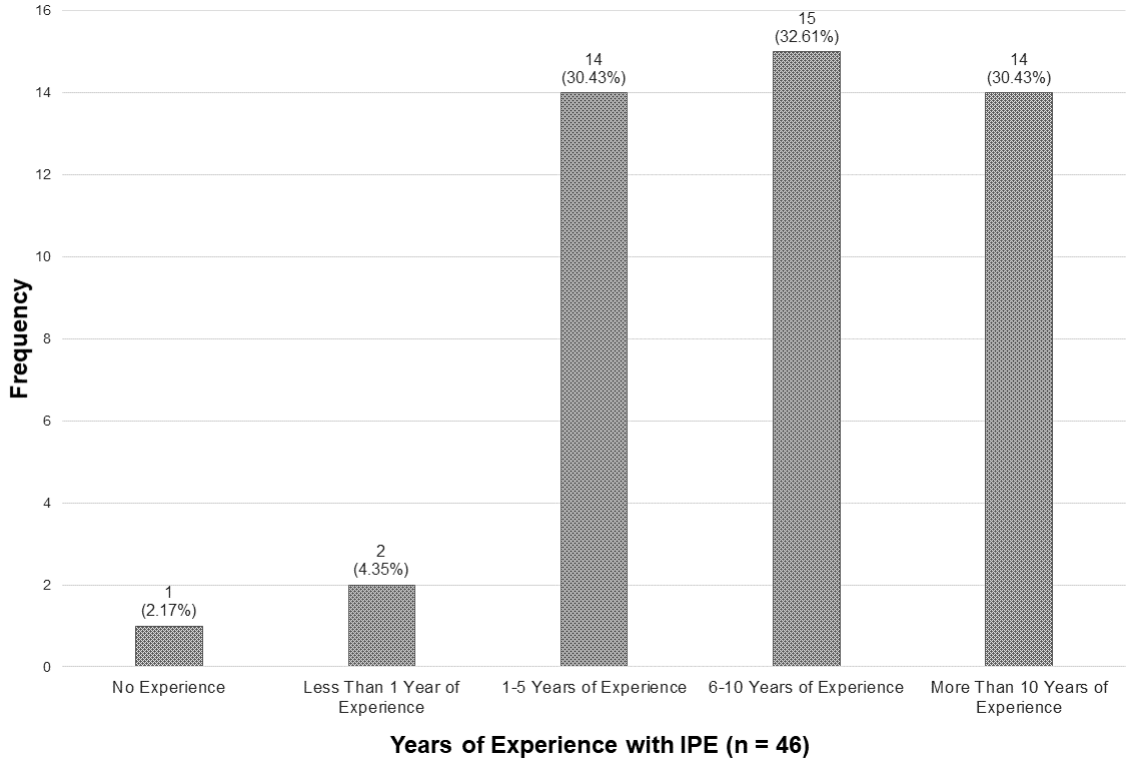
The results on participants' IPE experiences addressed three of this study's research questions:

2. What are health sciences educators' experiences with and attitudes toward non-clinician facilitators of IPE activities?
3. What are health sciences educators' experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities?
4. How do these factors differ for in-person as compared to online settings?

The large majority of participants (63.04%) reported being very experienced in this area, indicating six or more years of involvement with IPE. Conversely, very few participants (6.52%) indicated less than one year or no experience with IPE. Figure 11 displays the frequency distribution of participant responses about length of IPE experience.

Figure 11

Participants' Length of IPE Experience

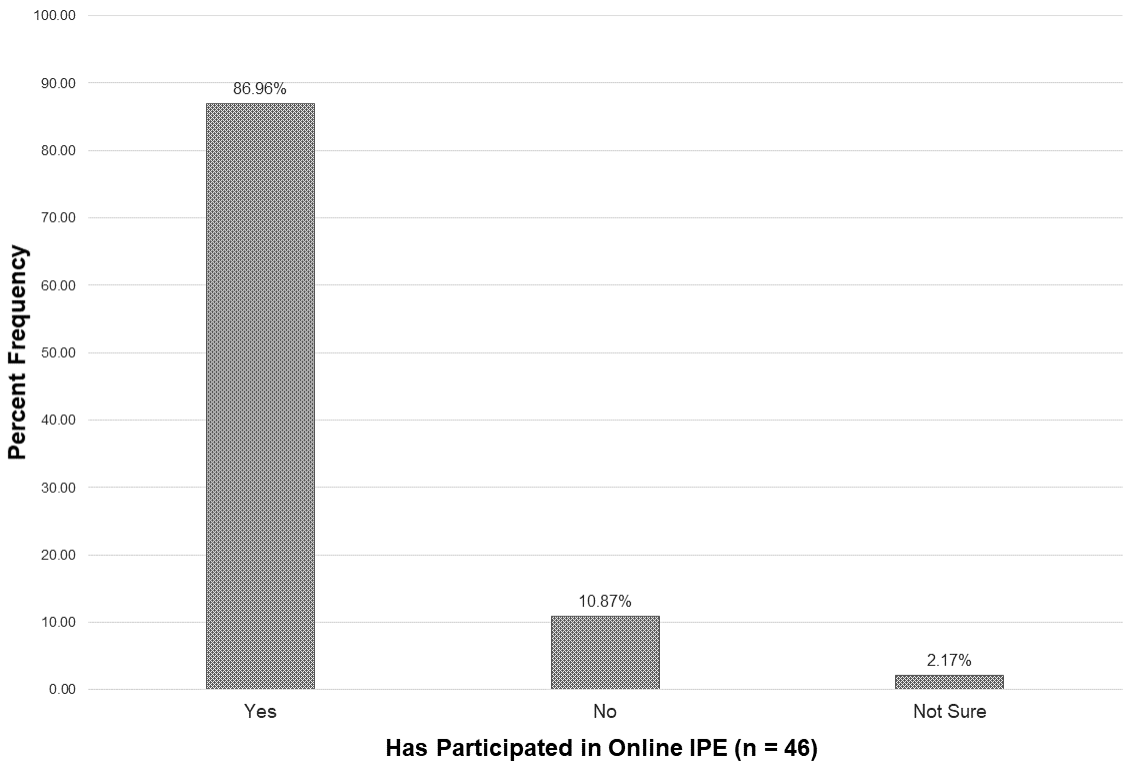


Note. Responses to question "How many combined years of experience do you have with IPE, both as a learner and/or a planner/facilitator?"

Participants were also experienced with IPE in specific circumstances: in online settings, and with non-clinician facilitators. More than three-quarters (86.96%) of participants indicated that they had taken part in IPE in an online format, while more than half (55.88%) indicated that they had taken part in IPE with non-clinician facilitators. Figures 12 and 13 provide a complete representation of these responses.

Figure 12

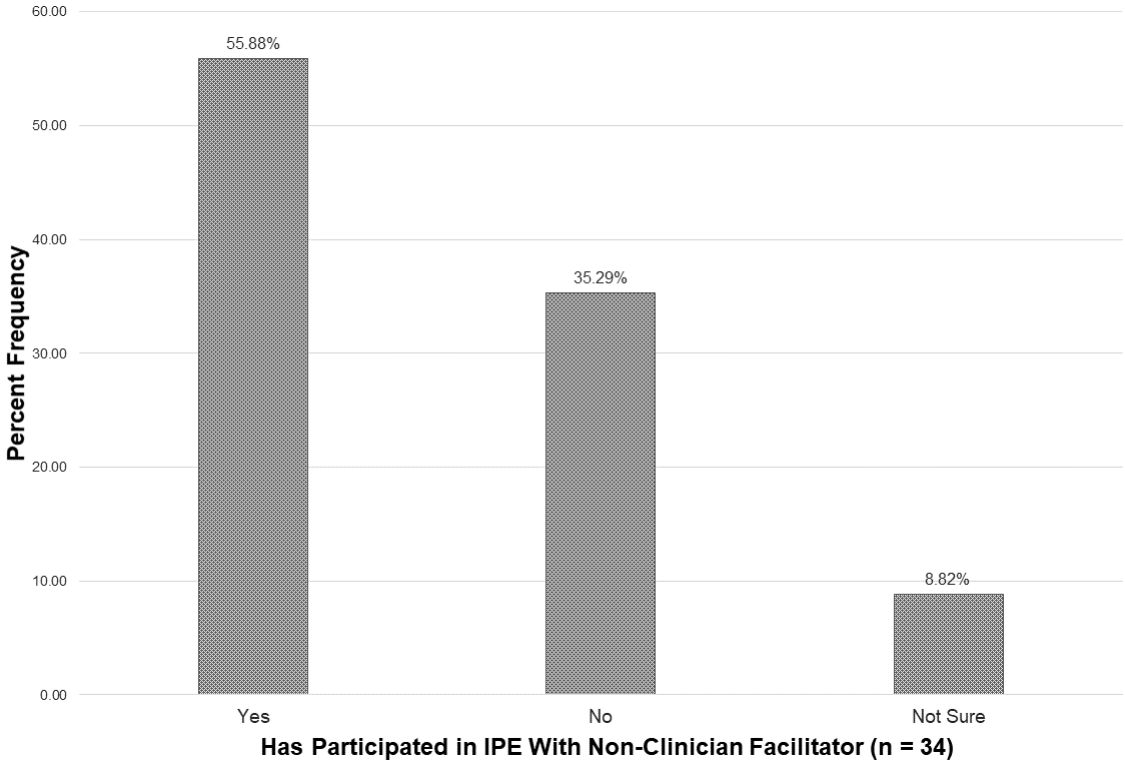
Participants' Experience With Online IPE



Note. Responses to question "Do you recall ever participating in an IPE activity that took place fully or partially online?"

Figure 13

Participants' Experience With Non-Clinician Facilitators of IPE



Note. Responses to question "Do you recall ever participating in an IPE activity that included non-clinician facilitator(s)? Examples of non-clinician facilitators could include, but are not limited to, administrative staff, instructional designers, or librarians."

These results show that this study's participants were extremely experienced in the realm of IPE. Not only had they largely spent years participating in IPE activities as learners, planners, and facilitators, but they also tended to have experience in the areas of specific concern to this study: online IPE and IPE with non-clinician facilitators.

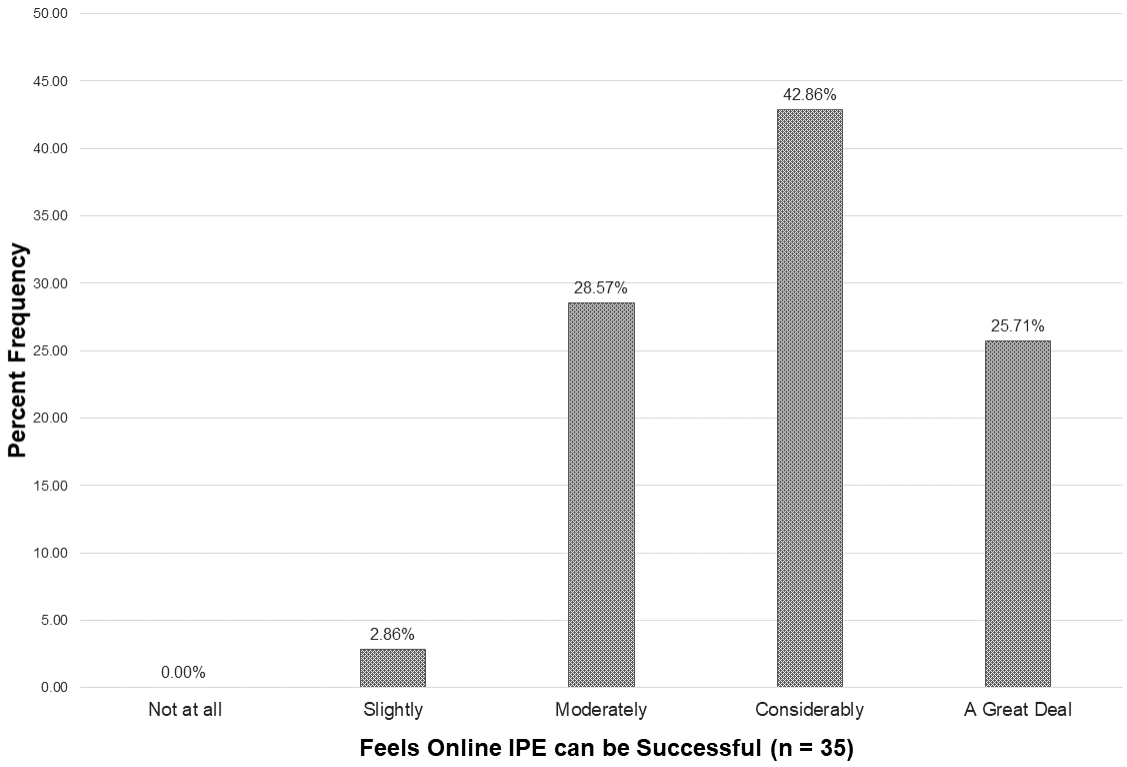
Online IPE was Perceived Positively

As shown in Figure 12 above, a large majority (86.96%) of the study's participants reported having participated in an IPE activity that took place fully or

partially online. This depth of experience was accompanied by largely positive attitudes toward online IPE. Nearly all (97.14%) participants felt that online IPE can be at least *moderately* successful. The most frequently chosen (42.86%) response was that it can be *considerably* successful. Notably, zero (0.00%) participants felt that it can be *not at all* successful. Figure 14 provides a frequency distribution for the responses to this 5-point Likert scale question.

Figure 14

Participants' Attitudes Toward Online IPE Success



Note. Responses to question "To what degree do you feel IPE activities that take place fully or partially online can be successful?"

Participants Described More Benefits Than Drawbacks of Online IPE. There were 30 participants who provided written responses to the free-text question that asked

them to share the reasoning for their response about the potential degree of success for online IPE activities. These written responses were analyzed in order to construct a framework on the benefits and drawbacks of online IPE that addressed one of this study's research questions:

4. How do these factors differ for in-person as compared to online settings?

Their responses consisted of 39 total codes: 23 (58.97%) with a positive orientation and 16 (41.03%) with a negative orientation. Together, they provided a summary of the benefits and drawbacks of conducting IPE activities in an online format. These included strong logistical benefits alongside the potential for decreased engagement.

The framework that emerged from the data provided a list of the perceived benefits and drawbacks of online IPE and focused on the following four domains: ***Logistics*** (positive and negative), ***Engagement*** (positive and negative), ***Participants*** (positive only), and ***Interpersonal Skills*** (positive and negative).

Logistics and Engagement Were Key Benefits and Drawbacks. The ***Logistics*** domain dominated with 10 total positive coding instances. The codes making up this domain on the benefits side were *Flexibility*, *Ease of access*, *Space constraints*, *Costs*, *Parking*, *Time away*, and *Comfort with online education*. Responses communicated that online IPE is simply easier to execute: "Online takes care of many logistics." Additionally, one participant pointed out that students and presenters "have gotten used to this kind of delivery method," perhaps making it less of a challenge than it used to be. At the same time, online modalities can bring about their own logistical challenges, as was displayed with two negative coding instances. The codes making up this domain on the drawbacks side were *Difficult facilitator movement* and *Technical difficulties*.

Conversely, the ***Engagement*** domain dominated on the negative side with nine instances of coding. The included codes were *Student engagement*, *Lack of hands-on*, *Lack of participation*, and *Lack of interactivity*. One participant shared that they "think there is always higher-quality interaction in person" while another stated "there is simply no substitution for working with individuals in person." Another pointed out that "it is easier for students to not participate" and "in person engagement tends to be better with more interactive components." Conversely, participants also found that in some cases the online setting improves engagement, which was represented by three coding instances. The codes were *Equal playing field*, *Interactivity*, and *Participation*. One stated that they found that "learners who normally would not participate in group activities or speak up in class can be more likely to participate online with chat features, etc."

One domain that only showed up as a positive was ***Participants***, with eight instances. Responses showed an agreement that the online setting has widened the pool of potential participants in IPE. Codes in this domain were *Geographic diversity*, *Diversity of disciplines*, *More participants*, and *Distance learners*. A participant summarized this with their assessment that online IPE "allows for far more people to attend who are widespread across the state or country. Increases discipline representation to the discussion." Responses got at the various nuances of this concept, pointing out the ability to easily include multiple campuses and disciplines that are not taught at one's own institution in an activity.

The final domain that emerged from these responses was ***Interpersonal Skills***. Unlike the previously discussed ***Engagement*** domain which was focused on the level of engagement students had with the IPE activity, this domain was focused on the potential

for students to build the interpersonal skills needed for IPE during the activity. The seven instances of this code were weighted more heavily on the negative side with five as compared to two on the positive side. The codes making up the drawbacks were *Communication skills*, *Relationship building*, and *Body language*. Participants highlighted how difficult it can be to build and measure communication skills, build relationships, and to read body language while using online meeting software. They also recognized that building interpersonal skills is one of the primary goals of IPE. Other participants pointed out the benefits of building interpersonal skills in an online setting when much current interprofessional work takes place online, resulting in the code *Models online interprofessional work.*

The data showed a complex situation in which online IPE can have benefits and drawbacks in the same domains. While a lack of engagement and opportunities to build interpersonal skills were viewed as drawbacks to online IPE, the huge proportion (97.14%) of participants who felt that online IPE can be at least *moderately* successful indicated with their free-text responses that the benefits of logistical ease and a wider participant base may outweigh them. These results can also inform the ways that facilitators function in order to amplify the benefits and reduce the drawbacks of online IPE. Figure 15 provides a complete listing of the domains, individual codes, and their frequencies that emerged from the data on benefits and drawbacks of online IPE.

Figure 15

Benefits and Drawbacks of Online IPE Coding Framework

Question	Please share the reasoning for your answer to the previous question - To what degree do you feel IPE activities that take place fully or partially online can be successful?	
Orientation	**Positive (23)**	**Negative (16)**
Domain (12)	**Logistics (10)**	**Logistics (2)**
Codes	Flexibility (2) Ease of access (2) Space constraints (2) Costs (1) Parking (1) Time away (1) Comfort with online education (1)	Facilitator movement (1) Technology (1)
Domain (12)	**Engagement (3)**	**Engagement (9)**
Codes	Equal playing field (1) Interactivity (1) Participation (1)	Student engagement (4) Lack of hands-on (2) Lack of participation (2) Lack of interactivity (1)
Domain (8)	**Participants (8)**	
Codes	Geographic diversity (4) Diversity of disciplines (2) More participants (1) Distance learners (1)	
Domain (7)	**Interpersonal Skills (2)**	**Interpersonal Skills (5)**
Codes	Models online interprofessional work (2)	Communication skills (2) Relationship building (2) Body language (1)

Success Factors for Online IPE

Of the participants who reported having participated in an IPE activity that took place fully or partially online, 28 provided written responses to one or both of the free-text questions that asked them to describe the factors contributing to online IPE activities'

success, or lack thereof. These responses were analyzed in order to build an online IPE success factors framework that addressed two of this study's research questions:

1. What knowledge, skills, and abilities do health sciences educators deem necessary for facilitators of IPE activities?
4. How do these factors differ for in-person as compared to online settings?

Their responses demonstrated that engagement was the primary concern when planning and facilitating online IPE. It was also revealed that overall, participants found their experiences with online IPE to be largely successful.

Designing an Engaging Activity was the Top Factor for Success. The part of the framework that emerged from coding the pro-success responses was focused around the five domains of ***Designing for Engagement***, ***Strong Facilitators***, ***Effective Planning***, ***Successful Technology***, and ***Engaged Students***.

Designing for Engagement ranked highest among domains for the pro-success responses. This domain was represented 42 times in the responses to this question. It encompassed the codes *Small group interactions*, *Discussion*, *Diverse students*, *Flipped classroom*, *Interactivity*, *Entertainment value*, and *Topic*. Participants were focused on the need for "active participation from students," frequently in the form of small discussion groups held in breakout rooms. They also cited the importance of student professional diversity in order to make the activity as engaging as possible. Required attendance was posited as a way to ensure this needed interprofessional mix. Assigning pre-work in order to use a flipped classroom model and keep the session interactive and fun was another frequently-suggested method to increase engagement. Choosing an interesting topic that "crosses all disciplines" for the online IPE activity was also

highlighted: “the scenario is what attracts participants.”

The next domain by frequency of codes was ***Strong Facilitators***, with 24 appearances for pro-success factors. This domain included the codes *Skills*, *Diversity*, *Attitudes*, and *Experience*. Participants cited the need for the facilitators to have been well-trained and for them to keep “the conversation going by asking individuals to contribute.” Relatedly, it was deemed important for facilitators to engage in “expectation setting regarding participation and goals.” Study participants also found value in the diversity of facilitators from different professions and different institutions. Additionally, several responses focused on the attitudinal factors the facilitators brought to the online IPE activity: being dedicated, student-centered, collaborative, detail-oriented, and exhibiting buy-in were all mentioned.

There were 14 code instances in the ***Effective Planning*** domain. These codes included *Planning support*, *Scheduling*, and *Pre-packaged curriculum*. Of note, two participants highlighted the value of dedicating a large block of time for the activity.

Next and with only 11 instances of coding was the ***Successful Technology*** domain. This domain was made up of the codes *Functionality*, *Appropriate use of tools*, and *Skills*. Responses in this domain attributed some of their online IPE activities’ success to technology tools functioning as expected. Additionally, planners needed to use online learning platforms, interactive polling, and other tools in effective ways. One participant summed this up by stating, “The virtual setting forces them to be thoughtful about utilizing tools that weren’t always necessary in the live setting.” The need for facilitators to be technologically skilled was not frequently cited. One participant listed having an individual dedicated to the meeting software controls as a success factor.

Finally, the level of engagement that students bring to an online IPE event was cited 8 times within the ***Engaged Students*** domain. Codes within this domain were *Attitudes*, *Behaviors*, and *Experience*. Participants highlighted the need for students to be flexible, interested, enthusiastic, and to turn their cameras on.

Lack of Engagement From Students Took Away From Event Success.

Conversely, ***Lack of Student Engagement*** was the top domain that emerged from the responses to the free-text question about factors that contributed to online IPE activities being unsuccessful. Other domains in the anti-success component of the framework consisted of ***Inability to Recreate In-Person Experience***, ***Technical Issues***, ***Problems With Facilitators***, and ***Time Constraints***.

Lack of Student Engagement domain codes appeared 14 times in the responses to this question, with the top code overall being *Lack of participation*, which was cited 10 times. One participant stated that, "Some people logged on but had screens off. I'm assuming they weren't actually participating." Another noted that "it was harder to get the more reserved ones involved in small or big group discussions." This lack of participation, along with *Attendance issues* and *Lack of student preparation*, made this domain a key part of the framework.

The next most frequently-cited domain was ***Inability to Recreate In-Person Experience***. This domain was coded 11 times. Codes in this domain included *Environment not engaging* and *Lack of applicability*. These codes revolved around the factors that separated the in-person experience from the online experience, including a lack of hands-on, meaningful, or realistic activities, and a lack of communication, body language, and "workshop feeling."

The ***Technical Issues*** domain appeared only four times throughout the responses. Three participants mentioned general *Technical difficulties*, issues, or glitches, while one participant specifically called out *Screen sharing complications*.

A domain that was infrequently coded was ***Problems With Facilitators***, with only three combined instances of the codes *Underperformance* and *Too few facilitators*. One participant described a situation in which "moderators were unsure of how to direct conversation." Another stated that there were "not enough facilitators."

Finally, ***Time Constraints*** emerged as a domain with one instance each of *Lack of planner time*, *Lack of facilitator time*, and *Lack of student time*.

Looking at the pro-success and anti-success domains together, engagement emerged as the most important factor relating to the success, or lack thereof, of online IPE activities. The need to design for engagement was the overall top success factor, while the related need to have engaged students also emerged as a success domain. Conversely, a lack of student engagement was the top factor contributing to unsuccessful IPE activities, while an unengaging environment also emerged as a factor on the anti-success side.

Finally, it is notable that three participants cited having "great" or "powerful" speakers as a positive, while the use of lectures was cited as a negative by two participants. The results did not show a consensus on whether speakers/lectures add value to online IPE.

Overall, out of a total of 134, there were 99 (73.88%) coded instances of pro-success factors compared to only 35 (26.12%) coded instances of anti-success factors, indicating that participants had much more to say in support of what made their online

IPE activities successful than what made them unsuccessful. Five out of 28 participants either left the anti-success factors question blank, or provided a written response that indicated that there were no factors that contributed to their online IPE activity being unsuccessful.

This framework demonstrated the importance of engagement in successful online IPE activities. Additionally, it provided valuable information on the facilitator strengths and weaknesses that can add to or detract from the success of online IPE activities. Figure 16 provides a complete listing of the domains, individual codes, and their frequencies that emerged from the data on success factors for online IPE.

Figure 16

Online IPE Success Factors Coding Framework

Question	Please consider the instance of online IPE you described in the previous question, and describe any factors that contributed to it being a **successful** IPE activity.	Please consider the same instance of online IPE and describe any factors that contributed to it being an **unsuccessful** IPE activity.
Domain	**Designing for Engagement (42)**	**Lack of Student Engagement (14)**
Codes	Small group interactions (9) Discussion (8) Diverse students (8) Flipped classroom (5) Interactivity (5) Entertainment value (4) Topic (3)	Lack of participation (10) Attendance issues (3) Lack of preparation (1)
Domain	**Strong Facilitators (24)**	**Inability to Recreate In-Person Experience (11)**
Codes	Skills (10) Diversity (7) Attitudes (5) Experience (2)	Environment not engaging (8) Lack of applicability (3)
Domain	**Effective Planning (14)**	**Technical Issues (4)**
Codes	Planning support (8) Scheduling (4) Pre-packaged curriculum (2)	Technical difficulties (3) Screen sharing complications (1)
Domain	**Successful Technology (11)**	**Problems With Facilitators (3)**
Codes	Functionality (5) Appropriate use of tools (4) Skills (2)	Underperformance (2) Too few facilitators (1)
Domain	**Engaged Students (8)**	**Time Constraints (3)**
Codes	Attitudes (5) Behaviors (2) Experience (1)	Lack of planner time (1) Lack of facilitator time (1) Lack of student time (1)

Skills Required for IPE Facilitation

All participants, regardless of whether they had experience with online IPE and/or

IPE that included non-clinician facilitators, were asked to provide free-text feedback on the knowledge, skills, and abilities required for in-person and online IPE facilitation. There were responses to one or both of these questions from 30 participants. These responses were analyzed in order to develop a framework on IPE facilitators' needed knowledge, skills, and abilities. It addressed two of this study's research questions:

1. What knowledge, skills, and abilities do health sciences educators deem necessary for facilitators of IPE activities?
4. How do these factors differ for in-person as compared to online settings?

The responses provided a wealth of data on the characteristics needed to successfully facilitate IPE in-person and online.

Interpersonal Skills Were Valued Above Knowledge. The responses to these questions revealed that interpersonal skills were valued above other areas including knowledge and management skills. It was also demonstrated that participants did not feel that facilitator skills differed significantly for in-person as compared to online IPE beyond the need for online facilitators to possess a level of skill in technology and online teaching.

The framework that emerged from coding these responses was focused around the five domains of ***Interpersonal Skills***, ***Knowledge***, ***Systems and Competencies***, ***Management Skills***, and ***Technological Skills***.

Interpersonal Skills ranked highest among domains for both in-person and online IPE. This domain was represented 60 times in the responses to both questions, for a total of 120 appearances. It encompassed the codes *Encourage discussion/participation*, *Facilitation skills*, *Engaging leader/presenter*, *Communication skills*, *Debrief skills*, and

Team orientation. Frequencies of these codes were nearly identical for the in-person and online questions. The ability to elicit discussion and participation from all students was the most frequently-cited necessary skill overall, with participants mentioning the need to "draw in students who are not participating in discussion," and to encourage and guide participation. The importance of guiding the conversation without monopolizing it, and listening rather than teaching were also emphasized. Additionally, several participants specifically mentioned creating an environment of "psychological safety." One participant summed up the importance of the ***Interpersonal Skills*** domain in writing, "So much of IPE is about communication and teamwork, not clinical knowledge."

The next domain by frequency of codes was ***Knowledge***, with 34 appearances for in-person IPE and 32 appearances for online IPE. This domain included the codes *Content/activity knowledge*, *Roles/responsibilities/identities*, *Interprofessional planners/facilitators*, *Clinical experience*, and *Teaching ability/experience*. Again, the responses in the ***Knowledge*** domain were very similar across IPE formats. Participants cited the need for the planners and facilitators of IPE to represent a variety of professions, and thus have personal knowledge of interprofessional work while also modeling it. It was notable that while some participants wrote that facilitators must have "expert knowledge" of the content being covered, others specified that only a "basic knowledge of the topic at hand" was needed and that the facilitator "does not have to be an expert in the content." Some of the responses calling for knowledge were focused on knowledge of the planned IPE activity or knowledge of the participating health professions' roles and responsibilities, things that could be taught to facilitators of any background during a training session. Other participants specifically called out knowledge that must be

obtained through clinical experience.

Systems and Competencies was a lesser-cited domain that appeared at a comparable rate for the in-person and online questions, at 10 and nine mentions respectively. It consisted of the codes *TeamSTEPPS* – a curricular system provided by the Agency for Healthcare Research and Quality (n.d.) – and *IPEC core competencies*, a set of competencies provided by the Interprofessional Education Collaborative (n.d.). The pre-packaged TeamSTEPPS® curriculum and the IPEC core competencies document were referenced as tools that should be utilized by IPE facilitators from all backgrounds.

The lowest-ranking domain was ***Management Skills***, with the codes *Preparation/organization* appearing four times and *Time management* appearing three times in both the in-person and online responses.

Additionally, there were two codes (*Technology/meeting software skills* and *Online teaching ability/experience*) making up the ***Technological Skills*** domain that appeared a combined total of 20 times in the responses to the question about online IPE. While many participants clearly valued these skills, it was also common for them to state that the "same skills are needed for in-person and virtual." Some simply copied their responses for in-person IPE and pasted them into the answer space for online IPE. Others typed in "same as in-person" and then listed an additional skill component related to technological skills for the online IPE answer. While technological skills were clearly important, the heavy focus and value placed on the ***Interpersonal Skills*** domain was evidenced by these skills being mentioned as necessary for online IPE facilitators three times more frequently than technological skills.

This framework demonstrated that facilitators of both in-person and online IPE

activities need to have a wide range of knowledge, skills, and abilities, with a strong emphasis on interpersonal skills. With the exception of the Technological Skills domain, there was virtually no difference between the characteristics needed for in-person and online settings. Figure 17 provides a complete listing of the domains, individual codes, and their frequencies.

Figure 17

IPE Facilitators' Needed Knowledge, Skills, and Abilities Coding Framework

Question	What knowledge, skills, and abilities do you think are necessary for facilitators of **in-person** IPE activities?	What knowledge, skills, and abilities do you think are necessary for facilitators of **online** IPE activities?
Domain	**Interpersonal Skills (60)**	**Interpersonal Skills (60)**
Codes	Encourage discussion/participation (20) Facilitation skills (16) Engaging leader/presenter (9) Communication skills (8) Debrief skills (4) Team orientation (3)	Encourage discussion/participation (19) Facilitation skills (15) Engaging leader/presenter (10) Communication skills (9) Debrief skills (4) Team orientation (3)
Domain	**Knowledge (34)**	**Knowledge (32)**
Codes	Content/activity knowledge (17) Roles/responsibilities/identities (6) Interprofessional planners/facilitators (5) Clinical experience (4) Teaching ability/experience (2)	Content/activity knowledge (16) Roles/responsibilities/identities (5) Interprofessional planners/facilitators (5) Clinical experience (4) Teaching ability/experience (2)
Domain		**Technological Skills (20)**
Codes		Technology/meeting software skills (14) Online teaching ability/experience (6)
Domain	**Systems and Competencies (10)**	**Systems and Competencies (9)**
Codes	TeamSTEPPS (5) IPEC core competencies (5)	TeamSTEPPS (5) IPEC core competencies (4)
Domain	**Management Skills (7)**	**Management Skills (7)**
Codes	Preparation/Organization (4) Time management (3)	Preparation/Organization (4) Time management (3)

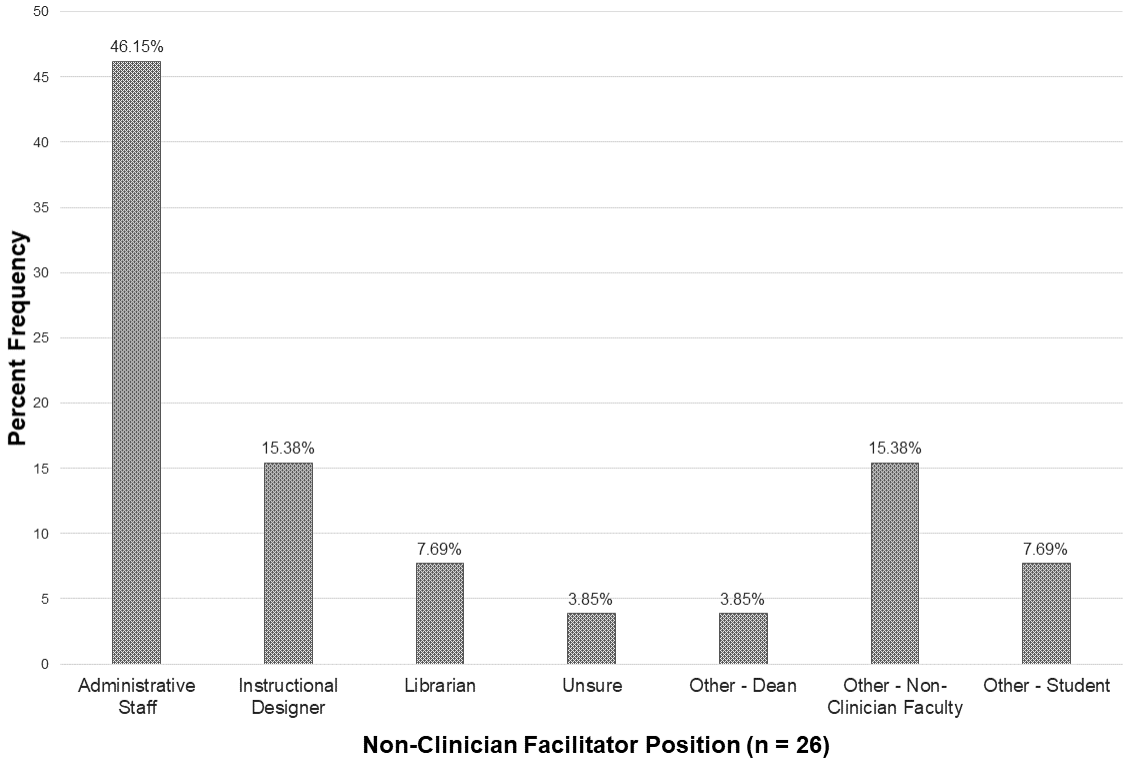
Non-Clinician Facilitators Were Common

As mentioned previously and shown in Figure 13, in addition to being experienced with online IPE, more than half (55.88%) of participants indicated having

also taken part in IPE with non-clinician facilitators. Nearly half (46.15%) of these non-clinician facilitators were administrative staff. Only two (7.69%) participants reported experience with librarian facilitators. Additionally, two (7.69%) participants reported students taking a role in facilitation. Figure 18 provides a complete breakdown of non-clinician IPE facilitator positions.

Figure 18

Positions of Non-Clinician IPE Facilitators



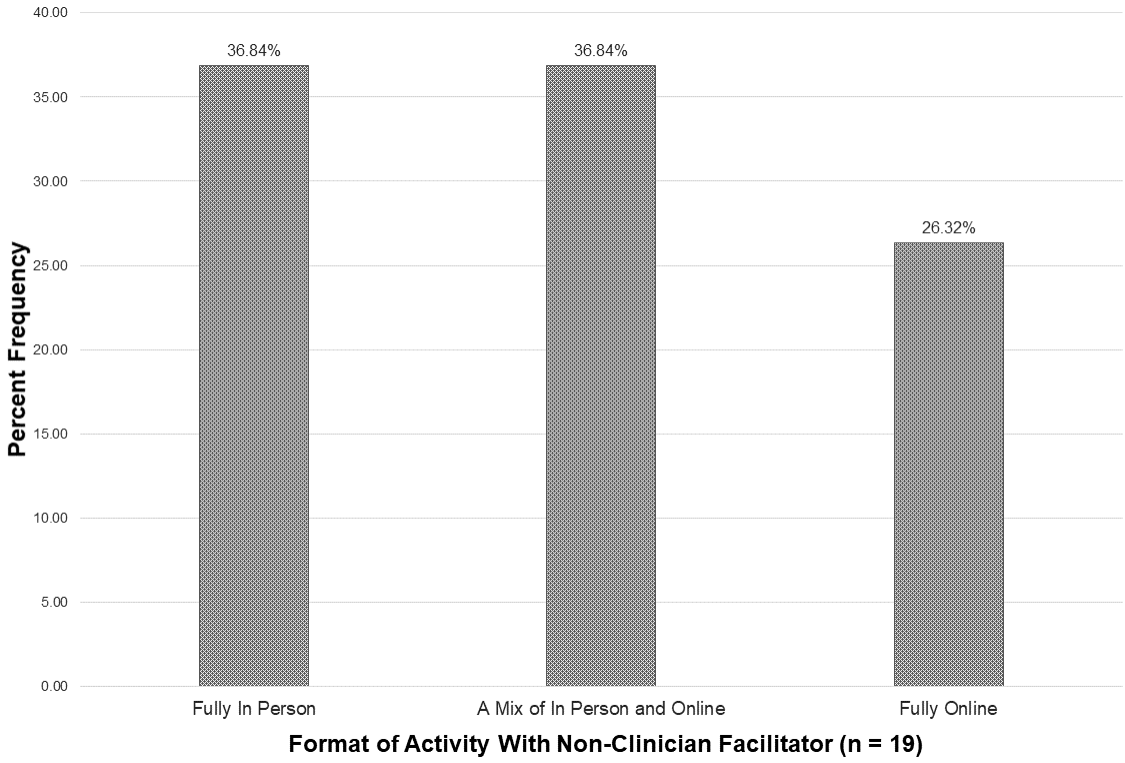
Note. Responses to question "You answered 'Yes' to the previous question, indicating that you have participated in an IPE activity that included non-clinician facilitator(s). Which type(s) of position(s) did they hold?"

Just under two-thirds (63.16%) of participants indicated that the IPE activity that utilized non-clinician facilitators that they had participated in was held at least partially

online. Figure 19 displays the distribution of in person, hybrid, and online formats for IPE with non-clinician facilitators.

Figure 19

Format of IPE Activities Including Non-Clinician Facilitators



Note. Responses to question "In what format was the IPE activity that included non-clinician facilitator(s) held?"

Success Factors for IPE With Non-Clinician Facilitators

Similarly to the online IPE responses which resulted in a framework of success factors, participants provided rich data on their experiences with non-clinician facilitators of IPE. Of the participants who reported having participated in an IPE activity that included non-clinician facilitators, 13 provided written responses to one or both of the free-text questions that asked them to describe the factors contributing to the IPE

activities' success or lack thereof. These written responses were analyzed in order to construct a framework on the success factors for IPE with non-clinician facilitators that addressed all four of this study's research questions:

1. What knowledge, skills, and abilities do health sciences educators deem necessary for facilitators of IPE activities?
2. What are health sciences educators' experiences with and attitudes toward non-clinician facilitators of IPE activities?
3. What are health sciences educators' experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities?
4. How do these factors differ for in-person as compared to online settings?

Fewer responses resulted in a framework with fewer levels; however, the domains that emerged provided ample insight. They revealed that engagement is the primary concern when planning and facilitating IPE with non-clinician facilitators. It was also demonstrated that overall, participants found their experiences with IPE including non-clinician facilitators to be predominantly successful, with 31 coding instances for pro-success factors and only 16 for anti-success factors.

Designing an Engaging Activity was the Top Factor for Success. Much like what was found with online IPE, ***Designing for Engagement*** emerged as the top domain when coding the pro-success responses on IPE that included non-clinicians facilitators. Other domains in this area were ***Strong Facilitators***, ***Engaged Students***, ***Effective Planning***, and ***Successful Technology***.

The ***Designing for Engagement*** domain echoed what was found in the online IPE success framework with 13 coding instances. Participants highlighted the need for

"dynamic/compelling activities for students" that should also be clinically relevant, small groups to encourage discussion, and a good interprofessional mix of students. One participant pointed out that having students lead the IPE activity naturally led to high levels of student engagement.

Next, the need for ***Strong Facilitators*** was represented eight times. It was shared in the responses that having enthusiastic, well-trained facilitators from a variety of professions led to success.

Having ***Engaged Students*** who actively participate in IPE was mentioned four times in favor of success. The pro-success factors were rounded out with three coding instances each for ***Effective Planning*** (well-designed curriculum, utilizing support people throughout) and ***Successful Technology*** (utilizing technology tools effectively, being familiar with the online platform, and having technology function during the activity). There were reflections of the online IPE success factors throughout these responses.

Problems With Facilitators Took Away From Activity Success. The data that were coded on the anti-success side of non-clinician facilitator IPE resulted in four domains. At the top was ***Problems With Facilitators***, followed by ***Lack of Student Engagement***, ***Ineffective Planning***, and ***Technical Issues***. This framework had some similarities to, but did not line up closely with, the anti-success side of the online IPE factors framework.

Problems With Facilitators were mentioned most often of any anti-success factor with seven coding instances. One participant stated that "non-clinicians struggle to connect with the clinical students. Their energy level and learning points don't always ring true for what is happening in the simulation…or in real life." It was also mentioned

that facilitators could be unprepared or lack facilitation skills or buy-in. One response discussed difficulty with training facilitators from areas that had high turnover at the institution.

The next domain detracting from the potential success of IPE with non-clinician facilitators was ***Lack of Student Engagement***, which was coded six times. It was brought up that students may have been unwilling to participate, or lacked the knowledge and experience to participate meaningfully. Notably, a participant wrote that "some students did not respect staff being facilitators and they did not fully participate."

Completing the anti-success framework were the two final domains, ***Ineffective Planning*** (scheduling problems and too many participants) and ***Technical Issues***. These domains were only coded for a combined total of three times.

This framework demonstrated the importance of engagement in successful IPE activities that include non-clinician facilitators, as well as the need for facilitator training in order to produce strong facilitators who will not detract from the event's value. It also made the case that non-clinician facilitators may not be appropriate in all roles and/or all types of IPE activities. Figure 20 provides a complete listing of the code domains and frequencies that emerged from the data on success factors for IPE with non-clinician facilitators.

Figure 20

IPE With Non-Clinician Facilitators Success Factors Coding Framework

Question	Please consider the instance of IPE with a non-clinician facilitator you described in the previous question, and describe any factors that contributed to it being a **successful** IPE activity.	Please consider the same instance of IPE with a non-clinician facilitator and describe any factors that contributed to it being an **unsuccessful** IPE activity.
Domain	**Designing for Engagement (13)**	**Problems With Facilitators (7)**
Domain	**Strong Facilitators (8)**	**Lack of Student Engagement (6)**
Domain	**Engaged Students (4)**	**Ineffective Planning (2)**
Domain	**Effective Planning (3)**	**Technical Issues (1)**
Domain	**Successful Technology (3)**	

Attitudes Toward Non-Clinician IPE Facilitators

Again all participants, regardless of any previous experiences or lack thereof with online IPE and/or IPE that included non-clinician facilitators, were asked questions to elicit their attitudes toward non-clinicians generally, and librarians in particular, as facilitators of in-person and online IPE activities. The results in this section directly addressed three of this study's research questions:

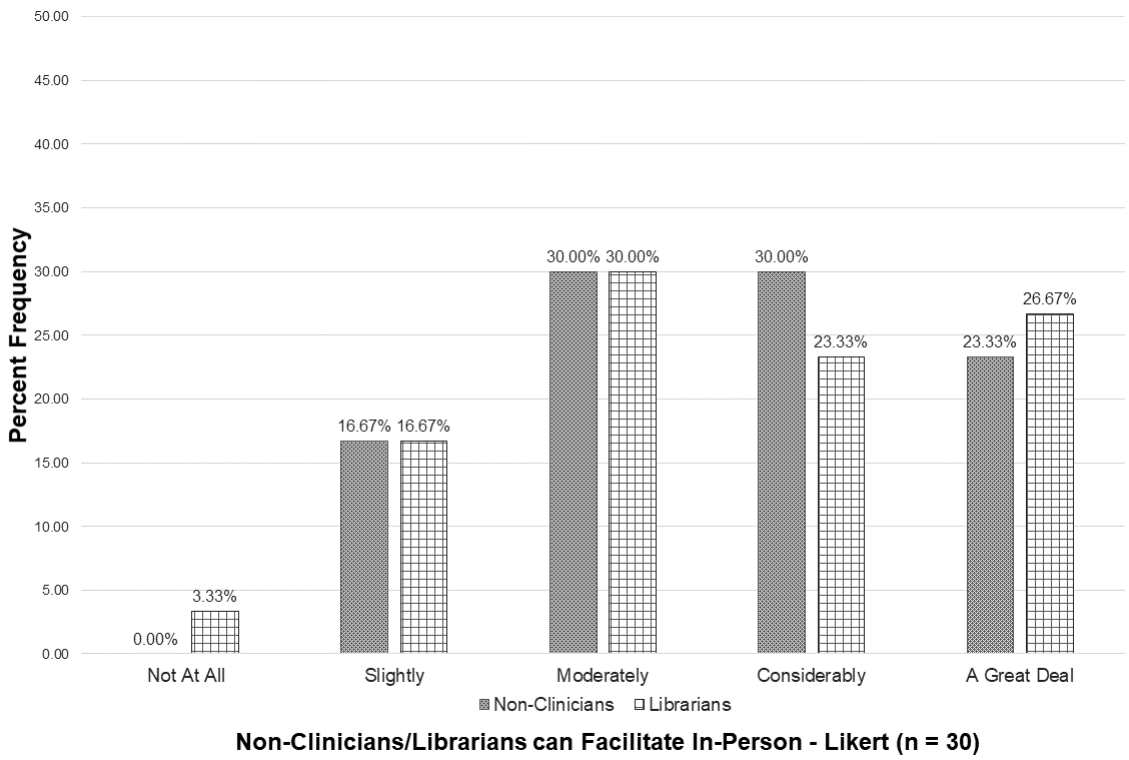
2. What are health sciences educators' experiences with and attitudes toward non-clinician facilitators of IPE activities?
3. What are health sciences educators' experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities?
4. How do these factors differ for in-person as compared to online settings?

Overall, participants' attitudes toward non-clinician IPE facilitators were positive.

Educators Largely Felt Non-Clinicians Possessed Needed IPE Skills. When asked to rate to what degree they felt non-clinicians and librarians possessed the characteristics necessary to successfully facilitate in-person IPE, the large majority (83.33% for non-clinicians; 80.00% for librarians) chose at least *moderately*, with *moderately* being the most frequently chosen response. No (0.00%) participants chose *not at all* for non-clinicians and only one out of 30 (3.33%) chose *not at all* for librarians. Figure 21 displays the complete responses to this question.

Figure 21

Attitudes Toward Non-Clinician and Librarian In-Person IPE Facilitation



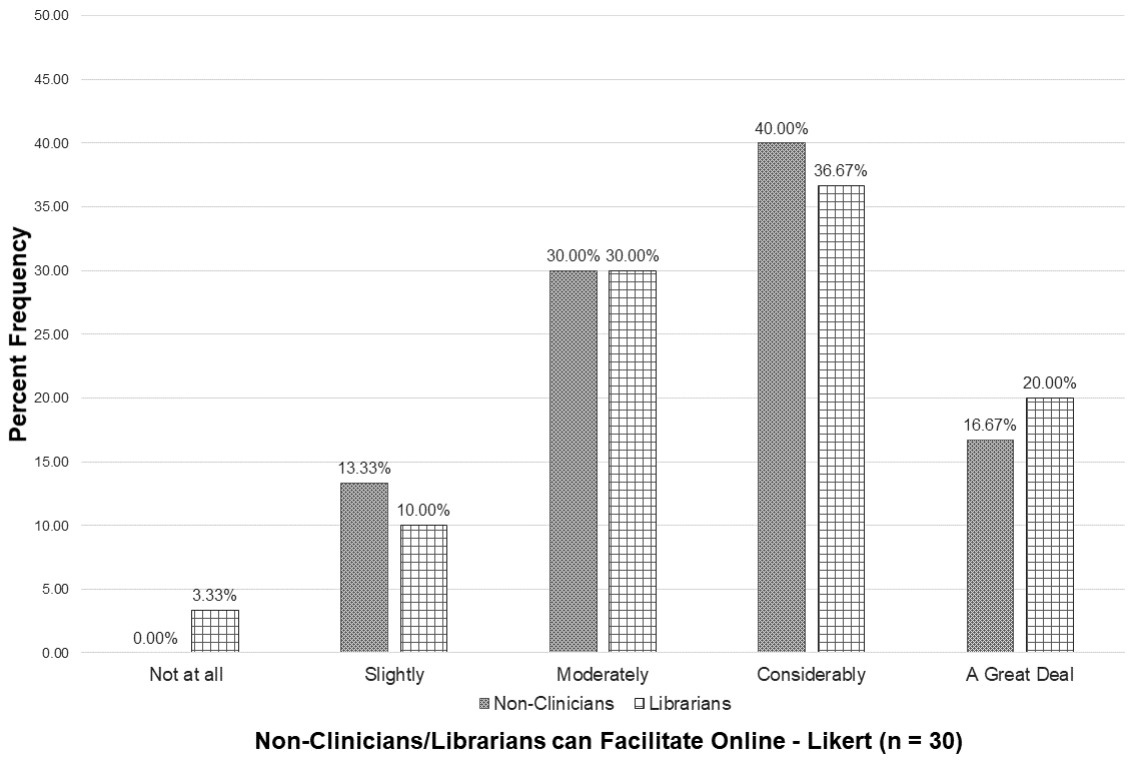
Note. Responses to questions "To what degree do you feel non-clinicians possess the knowledge, skills, and abilities you described in the previous question?" and "To what

degree do you feel librarians in particular possess the knowledge, skills, and abilities you described in the previous question?"

When asked to rate to what degree they felt non-clinicians and librarians possessed the characteristics necessary to successfully facilitate online IPE, a slightly larger majority (86.67% for both non-clinicians and librarians) chose at least *moderately*, with *considerably* being the most frequently chosen response. Again, no (0.00%) participants chose *not at all* for non-clinicians and only one out of 30 (3.33%) chose *not at all* for librarians. Figure 22 lays out a complete listing of the responses to this question.

Figure 22

Attitudes Toward Non-Clinician and Librarian Online IPE Facilitation



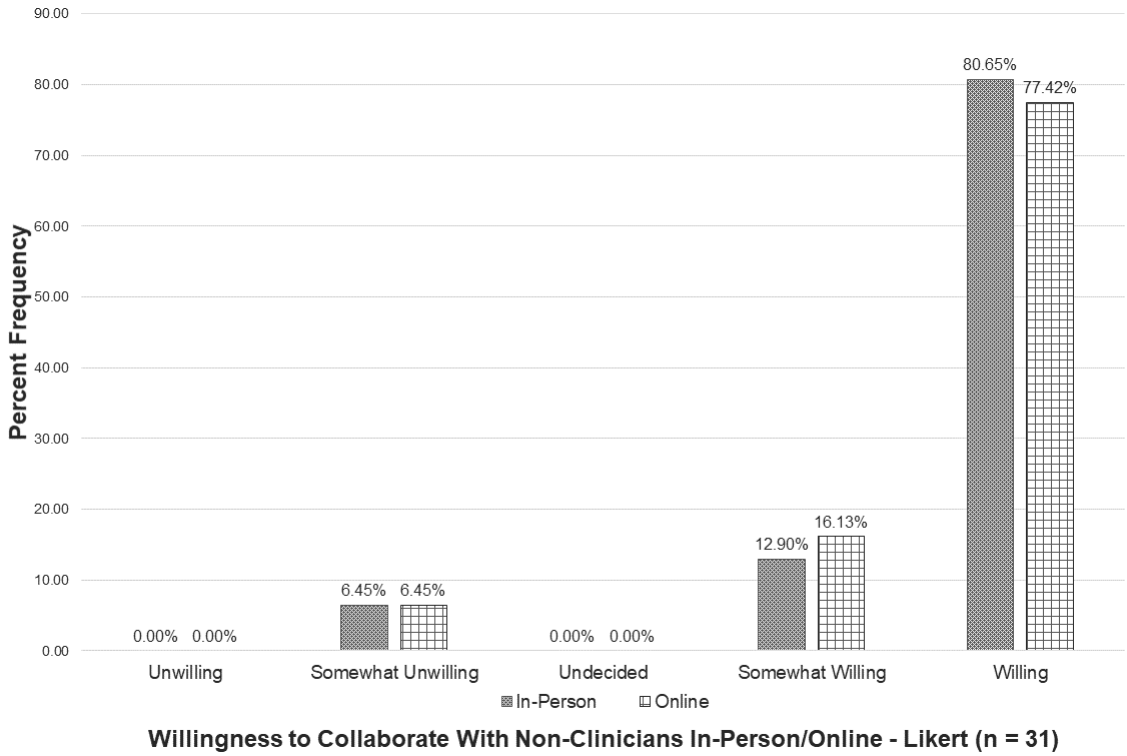
Note. Responses to questions "To what degree do you feel non-clinicians possess the knowledge, skills, and abilities you described in the previous question?" and "To what

degree do you feel librarians in particular possess the knowledge, skills, and abilities you described in the previous question?"

Educators Were Willing to Collaborate With Non-Clinicians on IPE. When asked to rate their willingness to collaborate with non-clinicians to facilitate IPE, the vast majority (93.55% for both in-person and online) chose at least *somewhat willing*, with *willing* being the most frequently chosen response. No (0.00%) participants chose *unwilling* for in-person or online and only two out of 31 (6.45%) chose *somewhat unwilling* for both in-person and online. Figure 23 displays the complete responses to this question.

Figure 23

Willingness to Collaborate With Non-Clinicians on IPE Facilitation



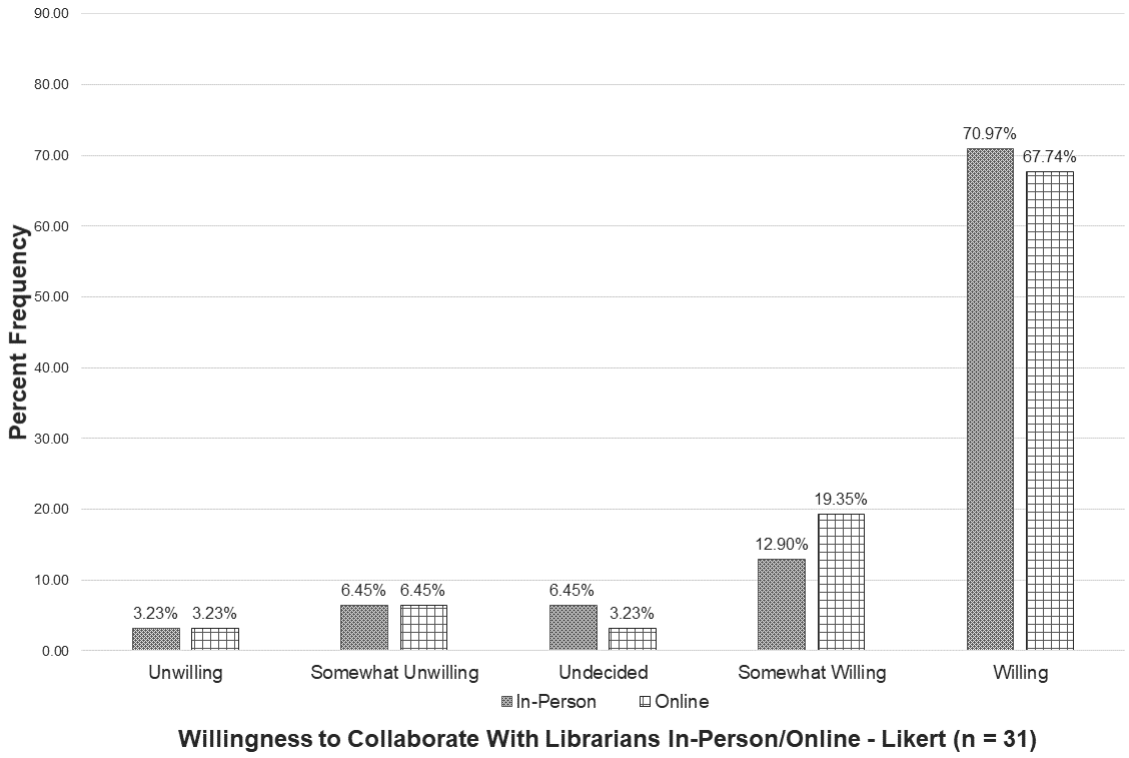
Note. Responses to questions "Please rate your willingness to collaborate with non-

clinicians on the facilitation of in-person IPE activities in the future" and "Please rate your willingness to collaborate with non-clinicians on the facilitation of online IPE activities in the future."

When asked to rate their willingness to collaborate with librarians in particular to facilitate IPE, the responses were slightly less positive. Still, the large majority (83.87% for in-person; 87.09% for online) chose at least *somewhat willing*, with *willing* being the most frequently chosen response. There were three (9.68%) participants who chose *unwilling* or *somewhat unwilling* for both in-person and online. Figure 24 provides a complete listing of the responses to this question.

Figure 24

Willingness to Collaborate With Librarians on IPE Facilitation



Note. Responses to questions "Please rate your willingness to collaborate with librarians

in particular on the facilitation of in-person IPE activities in the future" and "Please rate your willingness to collaborate with librarians in particular on the facilitation of online IPE activities in the future."

Knowledge and Skills Were Dominant Factors for Willingness to Collaborate. The study's two final free-text questions provided participants with the opportunity to share the rationales for their levels of willingness to collaborate with non-clinicians and librarians on IPE facilitation. There were 27 participants who responded to one or both of these questions. Coding this data resulted in a willingness to collaborate with non-clinicians/librarians on IPE framework that was largely focused on knowledge and skills as well as professional roles.

The top domain by frequency of coding for willingness to collaborate with non-clinicians was ***Knowledge/Skills***, with 35 combined coding instances (14 for non-clinicians; 21 for librarians). Codes making up this domain were *Clinical experience necessary/beneficial*, *Expertise*, *Facilitation skills*, *Information gathering/assessment skills*, *Clinical experience unnecessary/insufficient*, *Interpersonal skills*, *Teaching skills*, *Training,* and *Technology skills*. Participants called out the potential for non-clinicians to possess valuable expertise and be skilled in communication, database searching, evidence-based care, technology use, and more. Opinions on whether clinical experience was a help or hindrance were mixed, with some participants stating that "no history of clinical experience is not acceptable" and that they "feel they need to understand clinical practice to be totally effective," while others wrote that "the purpose of facilitating is not to know the answers but to guide the activities/discussion" and "knowledge and skills related to teaching/engagement are more important than clinical experience." One

participant went so far as to write,

> I think that it would be an advantage if the facilitator did not have any knowledge or skill in the fields of the participants - so, for a health-related IPE, having non-health professionals facilitate would be better than anyone who is a health professional - this would encourage participants to "educate" the facilitator, instead of expect the facilitator to teach.

Another participant pointed out that many gaps in knowledge that non-clinicians may have could be filled with training.

The next most oft-cited domain in this framework was ***Professional Roles***. Codes in this domain were used 23 times (11 for non-clinicians; 12 for librarians) and consisted of *Differs from clinician role*, *Not a clinician*, *Lack of student buy-in*, *Facilitator-student match*, *Awareness of own role*, and *Clear roles*. Some participants noted that non-clinicians could contribute to IPE in ways that reflected their support roles in clinical practice. Other comments falling into this area included participants pointing out that they themselves were non-clinicians who facilitate IPE, and as such feel confident that other non-clinicians could carry out the same work. Some participants noted that students may lack buy-in when working with non-clinician facilitators, and it may be necessary for clinical students to work with clinician facilitators while non-clinical students work with non-clinician facilitators. Several responses noted the necessity for all roles to be clear and all facilitators to be self-aware.

The ***Collaboration*** domain accounted for 19 instances of coding (8 for non-clinicians; 11 for librarians). Codes in this domain included *Part of interprofessional team*, *Collaborate with non-clinicians/librarians*, *Collaboration experience,* and

Librarianship is collaborative. Participants wrote about the fact that non-clinicians are part of the interprofessional team and thus should be included in IPE. One mentioned advocating for "big tent inclusion" of non-clinician professionals in IPE, while another stated that it simulates the "real world" where they collaborate with non-clinicians frequently. Additionally, non-clinicians were lauded for their robust experience with collaboration and librarianship in particular for the collaborative nature of the field.

Finally, the least-cited domain was ***Need for Interprofessional Mix***, with 16 combined uses (10 for non-clinicians; 6 for librarians) of the codes *Enriched by diversity* and *Need more help*. One participant focused on the idea that "the more diversity of skills, ideas, backgrounds, the better!" with another stating "We need all the help we can get!!!" It was stated that librarians particularly "bring a broader perspective across different health care entities" and "a different perspective that clinicians do not have."

This framework demonstrated the value of the diversity of knowledge and skills held by individuals from different professions. Out of 93 code instances in this framework, the ***Knowledge/Skills*** domain accounted for 35 (37.63%). Overall the responses largely showed support for non-clinician and librarian future involvement in IPE, although they included some mixed opinions on the level of necessity for clinical experience, again making the case that non-clinician facilitators may not be appropriate in all roles and/or all types of IPE activities. Figure 25 displays a complete listing of this framework's domains, individual codes, and their frequencies.

Figure 25

Willingness to Collaborate With Non-Clinicians/Librarians on IPE Coding Framework

Question	Please share the rationale for your level of willingness to collaborate with **non-clinicians** on the facilitation of in-person and online IPE activities in the future.	Please share the rationale for your level of willingness to collaborate with **librarians** in particular on the facilitation of in-person and online IPE activities in the future.
Domain	**Knowledge/Skills (14)**	**Knowledge/Skills (21)**
Codes	Clinical experience necessary/beneficial (4) Facilitation skills (4) Clinical experience unnecessary/insufficient (2) Interpersonal skills (2) Teaching skills (1) Training (1)	Expertise (6) Information gathering/assessment skills (5) Clinical experience necessary/beneficial (2) Facilitation skills (2) Teaching skills (2) Clinical experience unnecessary/insufficient (1) Interpersonal skills (1) Technology skills (1)
Domain	**Professional Roles (11)**	**Professional Roles (12)**
Codes	Not a clinician (3) Differs from clinician role (2) Facilitator-student match (2) Awareness of own role (2) Lack of student buy-in (2)	Differs from clinician role (6) Clear roles (2) Lack of student buy-in (2) Facilitator-student match (1) Not a clinician (1)
Domain	**Collaboration (8)**	**Collaboration (11)**
Codes	Part of interprofessional team (4) Collaborate with non-clinicians (2) Collaboration experience (2)	Part of interprofessional team (4) Collaborate with librarians (4) Librarianship is collaborative (3)
Domain	**Need for Interprofessional Mix (10)**	**Need for Interprofessional Mix (6)**
Codes	Enriched by diversity (8) Need more help (2)	Enriched by diversity (4) Need more help (2)

Participant Stories

This section contains a selection of the participants' stories provided with the added context of their backgrounds. In complement to the aggregated results provided previously in this chapter, this section serves to provide a more holistic and contextual view of the experiences and attitudes of the study participants. These stories were selected because of their richness of content as well as their distinction as being either

representative of the responses at large, or unique.

"**Struggle to Connect."** This participant was a medical doctor with a faculty rank and extensive experience with IPE, which included online IPE and in-person IPE with non-clinician facilitators. They described an online simulation activity including learners from medicine, nursing, dentistry, and public health. They highlighted the need for functioning technology, flexible students, competent planning, and not overcomplicating online IPE. This participant stated, "Our students greatly enjoy online IPE, and it gives us more flexibility, with less constraint due to room/space. They still have a similar experience with regard to teamwork and standardized patient interaction."

They also described their experience with non-clinician facilitators:

> We have included non-clinicians in our IPE both in person and online. Learning outcomes were mostly related to TeamSTEPPS. Learners were medical, dental, nursing, public health, and informatics students. Non-clinician facilitators ran debriefs after standardized patient simulations and during the mass casualty simulations.

When describing the factors that took away from the success of that activity, they stated the following:

> Non-clinicians struggle to connect with the clinical students. Their energy level and learning points don't always ring true for what is happening in the simulation (ie too enthusiastic during an MCI where patients didn't do well) or in real life (ie not reading the room when they are talking about who is the leader on a clinical team).

They felt that non-clinicians and librarians slightly possess the knowledge, skills,

and abilities to facilitate in-person and online IPE, but were willing to collaborate with both in the future as long as clinicians would also be involved and roles would be clear. They pointed out that they "don't have all the skills that I listed, as a doctor, because I don't know where the nursing and dental students are in their trajectory. IPE must be done as a team." Additionally, they brought up the idea of an IPE activity including medical and library students learning together.

"Student Led = Students Engaged." This participant did not provide much demographic information, but did indicate they had a moderate amount of IPE experience, including online IPE and IPE with non-clinician facilitators consisting of upper-class students. They described online IPE incorporating pharmacy, optometry, and medicine students, with a mix of synchronous and asynchronous activities. They called out the necessity of having "experienced and dedicated faculty leaders from each discipline" as well as enthusiastic students, a dedicated large block of time, and administrative support. They cited the potential for difficulties with getting students engaged in online IPE: "The students were more quiet… it was harder to get the more reserved ones involved in small or big group discussions." At the same time, they recognized that "the potential benefit of fully online is the ability to engage groups outside of your immediate location (e.g. from other disciplines outside your school)."

Their experience with non-clinician facilitators was unique in that it was led "by upper class students from each discipline," which lead to more engagement: "student led = students engaged."

They felt that non-clinicians and librarians possess a great deal of the characteristics needed to facilitate in-person and online IPE, and were willing to

collaborate with both in the future. Their justification for this was that "Just like in all teaching/learning, patient care… the more diversity of skills, ideas, backgrounds, the better!" and "Librarians bring a broader perspective across different health care entities, a strong knowledge of evidence based care, and excellent technology skills."

"**Not a Clinician."** This participant was a non-clinician staff member with a moderate amount of experience with IPE. That experience included online IPE and IPE with non-clinician facilitators consisting of administrative staff and instructional designers. They described taking part in an online TeamSTEPPS® Master Trainer course with diverse clinical and non-clinical learners and facilitators. They felt the activity was successful because of its highly interactive nature. When speaking to the potential for success of online IPE, they stated, "I think there is always higher-quality interaction in person, but if participants keep their cameras on and engage with others, and facilitators allow adequate time for discussion and avenues for learner engagement, then online sessions can be successful."

They felt that non-clinicians and librarians possess a great deal of the characteristics needed to facilitate in-person and online IPE, and were willing to collaborate with both in the future. The participant wrote, "I'm not a clinician, but I lead an IPE clinical program. I am confident that other non-clinicians are about to facilitate IPE activities just as I am." When speaking to willingness to work with librarians specifically, they wrote, "Librarians work with all disciplines, clinical and non-clinical, and are highly competent at their jobs. Why wouldn't I work with librarians?"

"Bridging the Clinician-Scientist Gap." This participant was a nurse faculty member with a moderate amount of experience with IPE, including with online IPE and

IPE incorporating non-clinician facilitators who were scientists. In fact, their highlighted experience was particularly relevant as its focus was "bridging the gap between clinicians and scientists." It included pairing nurse anesthesia residents with graduate students. They highlighted the need for a good mix of disciplines in small groups, having someone dedicated to online meeting platform controls, utilizing a flipped classroom model, and sufficient training of facilitators. When listing the needed skills for IPE facilitators, they focused on interpersonal skills and wrote, "Active listening skills. Ask open-ended questions. Draw in students who are not participating in discussion. Be as prepared as the students are with the subject matter. Resist the urge to teach or take over the conversation. Always turn it back to the students for discussion."

They felt that non-clinicians and librarians possess a great deal of the characteristics needed to facilitate in-person IPE and a considerable amount of the characteristics required for online IPE. They were willing to collaborate with both non-clinicians and librarians on IPE facilitation in the future. Their rationale for this was that "bringing in other disciplines has greatly enriched this IPE workshop. Again, the focus was bringing together clinicians and scientists. I found a challenge is to develop an activity that is of interest to all disciplines involved in the activity." They also highlighted their positive experiences with librarian experts at their institution.

"Non-Health Professional Advantage." This participant was a physical therapist with an academic rank and limited IPE experience. They did have experience with online IPE, but not with IPE with non-clinician facilitators. Their online IPE experience was another TeamSTEPPS® training that they praised for its interactivity. In discussing the potential for success of online IPE, they stated,

> If participants are encouraged to communicate and participate, I don't see a lot of difference between online and in-person (and this may provide a model for this same type of interaction professionally). Groups need to be small, though (4-5 people), and facilitated appropriately (encourage participation, not "taught" or "led").

They felt that non-clinicians possess a moderate amount to a great deal of the knowledge, skills, and abilities required for IPE facilitation, while librarians possess a great deal of these same characteristics. They were willing to collaborate with both non-clinicians and librarians on IPE facilitation in the future, and as described previously in this chapter, even stated the following:

> I think that it would be an advantage if the facilitator did not have any knowledge or skill in the fields of the participants - so, for a health-related IPE, having non-health professionals facilitate would be better than anyone who is a health professional - this would encourage participants to "educate" the facilitator, instead of expect the facilitator to teach

"**Clinical Experience Needed."** This participant was a dentist with an academic rank and a moderate amount of experience with IPE. They had experience with online IPE, but no experience with IPE that included non-clinician facilitators. They described an online poverty simulation that utilized a flipped classroom model and incorporated a case study and reflection exercise. They noted that "without face-to-face team practice, it's difficult to measure interpersonal communication skills."

They felt that non-clinicians possess some of the knowledge, skills, and abilities required to facilitate in-person and online IPE and were willing to collaborate with them

in the future. However, they felt that librarians do not possess those characteristics and were unwilling to collaborate with them in the future. They listed "clinical experience" and "cultural competence" as requirements for IPE facilitators. They stated that "a history of clinical experience is needed" and noted that "academic former clinicians are great," but "no history of clinical experience is not acceptable."

"Easier to Not Participate." This participant was a pharmacist with faculty rank and extensive experience with IPE. Their experience included online IPE but not IPE with non-clinician facilitators. They highlighted the potential for variation in student engagement from group to group and session to session. They noted that online IPE "seems to be most beneficial when students have had experience working with other professions daily and speaking to those interactions. We have discussed different strategies in our debriefs that have helped with engagement." When describing the benefits and drawbacks of online IPE, they wrote, "Poor interaction makes an IPE activity challenging. There have been instances where students will… remain silent when asked questions in a group or when called on directly" and:

> Online activities can be beneficial with simulations and offer ease of access. We can deliver the same type of information that we would in person as well. However, I think it is easier for students to not participate as well. In person engagement tends to be better with more interactive components.

They felt that non-clinicians and librarians possess the needed characteristics for in-person and online IPE to a considerable degree, and were willing to work with both in the future on IPE facilitation. Their rationale was that "non-clinicians can offer a wide range of experience and insight within an IPE setting depending on their backgrounds"

and “librarians can offer a strong knowledge base with IPE, particularly with information gathering and assessment. Disciplines from all healthcare fields can benefit from that skillset.”

Summary

The purpose of this study was to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. This chapter provided the results of this study, including the participant demographics and experiences, perceptions of and success factors for online IPE, skills required for IPE facilitation, success factors for and attitudes toward IPE with non-clinician facilitators, and a selection of representative and unique participant stories. Overall, the results focused heavily on the frameworks that emerged from the qualitative free-text question data. Chapter V provides a summary, evaluation, and interpretation of the results as they relate to the study’s research questions.

Chapter V

Discussion and Conclusion

This qualitative study was focused on assessing educator views on the knowledge, skills, and abilities needed by IPE facilitators, and exploring their experiences with and attitudes toward non-clinician facilitators of online IPE activities, particularly health sciences librarians. It provided a wealth of data that can inform how educators approach IPE at their institutions. Previous chapters laid out the study's purpose, foundation in the literature, methodology, and results. The first chapter consisted of a description of the purpose – to examine educators' experiences and attitudes in this area – in order to improve the problem – inadequate adoption of IPE – along with the research questions and a WHO conceptual model. Next, a review of the relevant literature provided an overview of IPE in the health sciences. This included librarian involvement in in-person IPE, including librarians as members of interprofessional teams and library space in support of IPE; and online IPE, including librarian involvement and the barriers and obstacles to in-person IPE that online IPE can solve. The literature review ended with an exploration of the literature as it related to the study's methodological factors. Next was a complete description and recounting of the methodology used. This was a qualitative study based in CIT, and included the development and deployment of a novel questionnaire consisting of multiple-choice and free-text entry questions, which was distributed to Texas educators with demonstrated interest in and experience with IPE. Finally, the fourth chapter described in detail the study's results, which included frequency distributions for the responses to multiple-choice questions and frameworks which emerged from the free-text data.

This chapter provides a discussion of the study's results and conclusions. It starts with an overview of the problem and methodological approach. Next, there is a discussion of the results of the research, focused on the answers to the four research questions that were laid out in the first chapter. This is followed by an examination of the study's limitations and implications for future research, practice, and education and training. Finally, it provides conclusions, a new conceptual framework, and a set of recommendations for more ubiquitous and successful adoption of IPE in the health sciences.

Overview of the Problem and the Methodological Approach

There has been a decades-long global push for IPE with the intent to improve collaborative practice and ultimately patient care. Health professions educators need to develop a stronger understanding of the factors that help and hinder the provision of IPE, particularly as they relate to facilitators. Such an understanding would enable them to better utilize the knowledge, skills, and abilities of the full complement of their institutions' talent resources, particularly in light of the paradigm shift from primarily in-person to more online formats for IPE activities brought about by the COVID-19 pandemic. Librarians have relevant experience in online health sciences education; however, they have typically not been deeply involved in IPE. There may be an opportunity for librarians to contribute more in this area by acting as planners and facilitators of IPE activities. The purpose of this study was to assess educator views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians.

The following research questions were intended to provide answers to the dilemma posed in the statement of the problem and guided this study:

1. What knowledge, skills, and abilities do health sciences educators deem necessary for facilitators of IPE activities?
2. What are health sciences educators' experiences with and attitudes toward non-clinician facilitators of IPE activities?
3. What are health sciences educators' experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities?
4. How do these factors differ for in-person as compared to online settings?

This research was carried out via a qualitative study utilizing a novel questionnaire consisting of multiple-choice and free-text questions grounded in CIT. Research participants were asked to recall and describe a time when the phenomenon of interest (online IPE and/or IPE with non-clinician facilitators) occurred. They were also asked to share their opinions on the success factors for IPE, skills required for IPE facilitation, and willingness to collaborate with non-clinicians on the facilitation of IPE. The multiple-choice questions were analyzed via frequency distributions while the free-text responses were analyzed via inductive thematic analysis principles.

Discussion of the Results of the Research

Participant responses to the novel questionnaire yielded data addressing the study's research questions. The results pertaining to each research question are summarized in this section.

Research Question 1

1. What knowledge, skills, and abilities do health sciences educators deem necessary

for facilitators of IPE activities?

Participants revealed through their responses to free-text questions that interpersonal skills for IPE facilitators were valued well above all other areas including technological skills. In fact, interpersonal skills dominated for both in-person and online modalities. These skills were focused on encouraging student participation, facilitating adeptly, being engaging, communicating effectively, debriefing appropriately, and having a team orientation. Knowledge was another important factor, with results focused primarily on the need for facilitators to have experience with interprofessional work and health professional roles. Participants also called out the need for facilitators to be well-trained. The results were mixed on whether clinical knowledge and experience were necessary. Specific systems and competencies as well as management skills were cited infrequently. Technological skills were deemed important for facilitating online IPE, but fell well below interpersonal skills in the responses.

The results on success factors for online IPE that mentioned facilitators reinforced the idea that they should be well-trained, diverse, and able to get students engaged in the activity. Participants were especially qualified to speak to the characteristics needed by IPE facilitators, as many of them described IPE experiences in which they were the learners as well as those in which they were the planners and facilitators. This connected to the literature review finding that IPE can play a role in continuing education (Babineau et al., 2018) and faculty development (Koffel & Reidt, 2015) and points to the idea that providing interprofessional learning opportunities to faculty may help IPE educators grow their facilitation skills.

Research Question 2

2. What are health sciences educators' experiences with and attitudes toward non-clinician facilitators of IPE activities?

More than half (55.88%) of participants indicated that they had taken part in IPE with non-clinician facilitators. Additionally, the large majority of study participants indicated that they felt non-clinicians at least *moderately* possessed the characteristics necessary to facilitate in-person (83.33%) and online (86.67%) IPE. An even higher percentage (93.55%) indicated that they were at least *somewhat willing* to collaborate with non-clinicians on IPE facilitation in the future.

Free-text responses addressing this research question revealed that engagement was the primary concern when planning and facilitating IPE with non-clinician facilitators. Additionally, it was demonstrated that participants found their IPE experiences including non-clinician facilitators to be predominantly successful.

When sharing success factors for IPE with non-clinician facilitators, participants indicated that designing engaging activities was the most important factor. They also highlighted the need for enthusiastic, well-trained facilitators from a variety of professions, as well as engaged students, effective planning, and successful technology. The top factor that detracted from success was problems with facilitators. These problems included the potential for non-clinician facilitators to have difficulty connecting with clinical students, as well as facilitators being unprepared or lacking skills. Other anti-success factors were lack of student engagement, which was at times related to students' lack of respect for non-clinician facilitators. Finally, ineffective planning and technical issues detracted from success to a smaller degree.

Participants had much more to say about pro-success than anti-success factors, indicating largely positive attitudes toward non-clinician facilitators of IPE. At the same time, the results also made the case that non-clinician facilitators may not be appropriate in all roles and/or all types of IPE activities.

When asked about the rationale for their level of willingness to collaborate with non-clinicians on the facilitation of IPE in the future, participants focused on the knowledge and skills that non-clinicians bring to the table in the areas of facilitation, interpersonal skills, teaching, and more. However, some participants pointed out non-clinicians' lack of clinical experience as a negative.

Other important factors affecting willingness to participate with non-clinicians related to professional roles, including the need for facilitator and student roles to match and the potential for a lack of student buy-in when working with non-clinician facilitators. The highly collaborative nature of IPE and the need for a diverse interprofessional mix when facilitating IPE were also factors in favor of participants' willingness to collaborate.

Results overall were positive and reflected the Likert question responses indicating participants were willing to collaborate with non-clinicians on the facilitation of IPE due to their possession of the needed knowledge, skills, and abilities.

Research Question 3

3. What are health sciences educators' experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities?

Only two (7.69%) participants reported experience with librarian IPE facilitators. This aligns with the limited documentation of direct librarian involvement with both in-

person and online IPE that was found in the literature. Despite this, the large majority of study participants indicated that they felt librarians at least *moderately* possessed the characteristics necessary to facilitate in-person (80.00%) and online (86.67%) IPE. A similar proportion (83.87% for in-person; 87.09% for online) indicated that they were at least *somewhat willing* to collaborate with librarians on IPE facilitation in the future.

When asked about the rationale for their level of willingness to collaborate with librarians on the facilitation of IPE in the future, participants focused on the expertise that librarians possess in the areas of information gathering and assessment, facilitation, teaching, and more. However, some participants pointed out librarians' lack of clinical experience as a negative.

Other important factors affecting willingness to participate with librarians were focused around professional roles, including the need for roles to be defined clearly and the fact that students may lack buy-in when working with librarian facilitators. The highly collaborative nature of IPE and the field of librarianship were factors in favor of participants' willingness. They also called out the need for an interprofessional mix when facilitating IPE. This connected to the findings in the literature review that showed that there is a growing consideration of librarians as members of interprofessional healthcare and/or education teams. Modeling typical interprofessional work with librarians while facilitating IPE activities seemed to make sense to participants.

Results overall were positive and in line with the Likert question responses that indicated participants felt librarians possessed the needed characteristics and thus were willing to collaborate with them.

Research Question 4

4. How do these factors differ for in-person as compared to online settings?

Perhaps due to the large-scale shift to online education that occurred as a result of the COVID-19 pandemic, participants were extremely experienced with IPE in online settings. More than three-quarters (86.96%) indicated that they had taken part in IPE in an online format. They also had positive attitudes toward online IPE, with nearly all (97.14%) participants feeling that online IPE can be at least *moderately* successful, and zero (0.00%) participants feeling that it can be *not at all* successful.

In line with these results, participants also indicated that there were more benefits than drawbacks of online IPE. Logistical ease and the capability for more and a wider range of people to participate in online IPE emerged as the top benefits. This focus on logistics mirrored what was shown in the literature: online IPE can ease the barriers and obstacles to in-person IPE. The potential for less engagement and the diminished capability to build interpersonal skills in online IPE were cited as drawbacks. Overall, results indicated that benefits outweighed drawbacks. This echoed the literature review finding that the *learning with others* component so fundamental to IPE does not have to equal students physically being in the same place at the same time (Bainbridge & Wood, 2012, p. 455).

Participants also provided rich responses on the factors that contributed to and detracted from the success of online IPE activities. The factors for success were designing engaging activities, utilizing strong facilitators, planning effectively, using technology successfully, and having engaged students. The factors detracting from success were a lack of student engagement, the inability to recreate the in-person

experience online, technical issues, problems with facilitators, and time constraints. Participants shared much more about the success factors than the anti-success factors for their online IPE experiences, again reinforcing the idea that this modality was viewed positively by educators. While there was agreement that online IPE cannot fully replace in-person interprofessional learning opportunities, it was seen as an appropriate complement to in-person IPE offerings.

When examining the responses related to the skills required for IPE facilitation, it was demonstrated that participants did not feel there was a significant difference between in-person and online IPE, beyond the need for online facilitators to possess a basic level of skill in technology and online teaching. Facilitator technology skills did not appear to be a major factor in online IPE success, contrasting with a suggestion in the literature that librarians were well-poised to contribute to IPE via technological support (Shipman et al., 2016, p. 72).

Limitations

The population for this study consisted of health sciences administrators, faculty, and staff in the state of Texas who were involved with IPE, with a study participant sample that was primarily drawn from the subpopulation of members of TX IPE. Since all participants were likely residents of the state of Texas, the study was not representative of other geographic regions. While it appeared that the pool of participants was somewhat diverse, there was a low response rate to demographic questions as compared to some later questions. It is possible that some participants refrained from answering these questions because they were concerned about the potential for re-identification based on demographics. This resulted in an incomplete view of participant

demographics in the categories that were included as questions. It also made some of the planned statistical analyses comparing the various categorical and ordinal variables unfeasible. Additionally, participants were not asked about other demographic categories such as race, ethnicity, gender, or socioeconomic status. As such, the diversity of the pool of participants in these areas could not be examined for representativeness of the population; thus, the results were not generalizable. Another limitation was the lack of a second coder for the free-text question responses, detracting from the study's reliability. Finally, the focus on attitudes and experiences rather than outcomes assessment means this study serves merely as a starting point to inform future research in that area.

Implications

The results of this study have implications for future research, practice, and education and training. This study can serve as a starting point for future research on online IPE and IPE facilitators that is more focused on learning outcomes and explorations of the potential for causal relationships between IPE, collaborative practice, and improved patient care. It can also inform how educators approach and design IPE activities, particularly those that occur online and involve non-clinician facilitators. Finally, it can impact the populations that are considered for and recruited from as IPE facilitators, potentially widening the pool and enabling institutions to provide more robust IPE programs, answering the calls of prestigious health organizations to make IPE a top priority in service of improved patient care.

Implications for Future Research

The results of this qualitative study on educator views and experiences with IPE showed that educators are extremely open to both online IPE and IPE that incorporates

non-clinician facilitators, including librarians. It was also found that educators consider interpersonal skills and engagement to be the top factors for success in IPE. Educators largely feel that online and non-clinician facilitated IPE can be successful, but it is unclear if these feelings are supported by evidence. Future research can go further to examine and compare student learning outcomes in various IPE settings and with facilitators of different backgrounds to determine if interpersonal skills and engagement are in fact the most important factors. Additionally, more research needs to be done to show causal links between IPE, collaborative practice, and improved patient care. Once those links are established, research examining how IPE modalities and facilitators affect them can be conducted.

Implications for Practice

In the near-term, this study's results can inform how educators approach and design IPE activities. Many recent IPE activities have been transitioned from in-person to online formats due to the COVID-19 pandemic. This transition may be permanent due to the logistical ease of online IPE and the potential for continued public health concerns precluding large group activities. The study results have shown that the most important factor for the success of IPE using online modalities is that it be engaging. The results have also shown that the most important factors for IPE facilitator success are interpersonal skills. Putting the bulk of an institution's time and budgetary resources toward designing engaging online IPE activities, as well as recruiting facilitators with strong interpersonal skills and/or providing training to facilitators to develop these skills can help to ensure that IPE programming will be of high quality and provide value to students.

Implications for Education and Training

Finally, the results of this study can impact which populations are considered for and recruited from as IPE facilitators. Instead of leaning largely – or exclusively – on clinicians, who are themselves a limited resource and who have limited time available for facilitation, institutions may want to widen the pool of potential facilitators to faculty without clinical backgrounds, administrative staff, instructional designers, librarians, and upper-level students. Individuals within these groups who possess strong interpersonal skills and the ability to make activities engaging are likely to be successful in the role of IPE facilitator, especially if they are provided with appropriate training on the roles of the professions involved in the activity and on the content of the activity itself. Having a larger group of facilitators available may enable institutions to provide more robust IPE programs, contributing to student success.

Conclusions

This qualitative study, grounded in CIT, provided an abundance of information that can inform how educators approach IPE at their institutions. After being unsure at the start that the participants would be experienced in the study's main focus areas, there was ultimately a vast amount of data from the research instrument's free-text entry questions. The researcher found that IPE educators had strong feelings about online IPE and IPE incorporating non-clinician facilitators. In fact, the results showed that nearly all participants had taken part in online IPE, and the majority had taken part in IPE with non-clinician facilitators. Encouragingly, the large majority of participants had positive attitudes toward non-clinicians and librarians as potential IPE facilitators, and were willing to collaborate with them in this area in the future.

One unexpected finding was an area in which participants did not have particularly strong feelings. Of surprise to the researcher, technology factors did not rank very highly among the success factors for online IPE. This may have been because the COVID-19 pandemic has prompted nearly everyone involved in education to gain familiarity with online meeting platforms, making it less of an issue than it would have been pre-pandemic. While it was clear that the technology must function properly and facilitators must possess the minimum skill level to actively facilitate online, the study participants did not seem to be particularly concerned with facilitator technology skills. Since librarians as a whole tend to have highly-developed technology skills, the researcher expected that a need for technical acumen would leave librarians well-positioned to contribute in this area. However, since technology did not emerge as a highly-important component of IPE, a strong connection could not be drawn there to librarians' skills.

Another unexpected finding was that two participants indicated that they have taken part in IPE that utilized upper-level students as IPE facilitators. This practice, while it does not appear to be widespread, was something the researcher had previously neither heard of nor considered. Students may be a facilitator resource that more institutions could tap, especially as one participant listed their use as a key factor for ensuring that the student learners were engaged in the IPE activity.

One secondary finding that was not surprising, but also not encouraging, was that several participants provided free-text answers underscoring their lack of familiarity with the role and functions of librarianship. While many of the participants did express a clear understanding and respect for the librarian role, a few did not. Most librarians are familiar

with this lack of understanding from colleagues and the general public. This small number of unfamiliar responses underscored the need for librarians to continue to be proactive in communicating their expertise and value at their institutions.

This study began with a librarian researcher questioning their professional role in the health sciences and seeking to leverage the collaborative and inclusive nature of librarianship for the benefit of health professions education. While a few responses reinforced the idea that there is a lack of understanding of the librarian role among our colleagues in academia, the results overall were extremely encouraging. IPE educators view non-clinicians and librarians as skilled colleagues who possess many of the needed characteristics of IPE facilitators, and want to collaborate with them on IPE. The researcher feels empowered to seek out and take on a stronger role in support of IPE, and encourages others with similar non-clinical roles to do so as well.

New Conceptual Framework

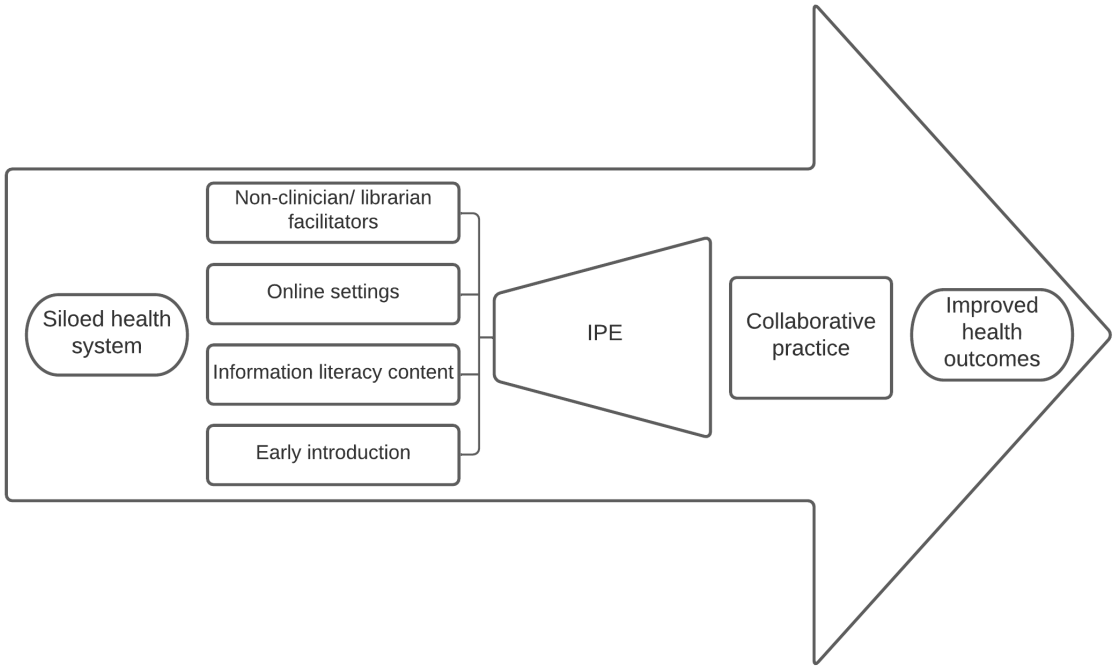
Many IPE activities continue to take the form of high-stakes simulations which are heavily focused on clinical content. Reflecting on the results of this study, the researcher posits that a partial realignment of this focus could enable institutions to provide more robust IPE programs in order to better prepare their students for real-world collaborative practice. This study's participants showed through their responses that building interpersonal skills for interprofessional communication is the most important goal of IPE. Additionally, they made it clear that engagement is the most important factor contributing to IPE's success. IPE does not need to be limited to high-stakes simulations of clinical scenarios. Engaging activities can help students build interpersonal skills outside of the clinical simulation or case-based IPE paradigm.

The researcher envisions IPE programs that are based on incorporating non-clinician and librarian facilitators, utilizing online settings for learning activities, teaching information literacy content, and introducing IPE experiences early in the curriculum. These factors would enable institutions to provide more robust IPE programs, allowing students to build solid foundations of interpersonal skills for collaborative practice, working up to the clinical simulations necessary for clinical learning later in the curriculum. It is possible to build interpersonal skills through engaging IPE activities that do not lean on clinical simulations. The researcher has had success with game-based team learning activities such as escape rooms when teaching information literacy skills. If designed thoughtfully, conducting these learning activities with interprofessional student teams would provide opportunities for students to build interprofessional communication skills in engaging formats. This strategy would introduce efficiencies while overcoming the barriers to large-scale clinical simulation-based IPE, allowing institutions to increase the number of IPE activities offered.

The WHO framework introduced in Figure 1 served as an inspiration for a new conceptual framework developed by the researcher and motivated by this vision and the results of the study. The framework begins with the currently siloed health system. Utilizing non-clinician/librarian facilitators and online settings, incorporating lower-stakes learning content such as information literacy skills, and introducing interprofessional experiences early in the curriculum are all factors that can contribute to institutions increasing their offerings of IPE activities for students. In turn, these more robust IPE programs can lead to stronger collaborative practice skills and ultimately improve health outcomes. Figure 26 displays this conceptual framework visually.

Figure 26

Strategies to Increase IPE Conceptual Framework



Recommendations

This final section provides a list of recommendations for IPE educators based on the results of this study. These recommendations highlight the strong potential for success with both online IPE and IPE that incorporates involvement from non-clinicians.

Educators Should Continue Providing Opportunities for IPE in Online Formats

Online IPE should continue because educators experienced in this modality feel that it can be successful. Additionally, it removes many of the barriers to in-person IPE, allows for a wider range and larger number of participants, and mirrors the interprofessional work that occurs online. Use it to expand IPE offerings and as a complement to in-person opportunities. Do not be overly concerned about everyone involved having strong technology skills. Having one skilled person running the controls may be enough.

Educators Should Focus on Making Online IPE as Engaging as Possible

An engaging IPE activity is one that holds students' interest and inspires them to participate. One way to ensure engagement is to have a good interprofessional mix of facilitators and students. Some strategies to ensure this mix are to require attendance and to invite participants from outside one's own institution. Another factor in favor of engagement is to choose a case or scenario that is interesting to all participants. Including scenarios that reflect the largely online coordinative care that takes place in non-acute settings (Dow, A. W. et al., 2016) is one way to help ensure online IPE activities translate effectively to real-life professional practice. Use facilitators who are skilled at eliciting participation, and/or train facilitators to improve these skills. Facilitators are one of the major factors contributing to engagement in an online IPE activity. Incorporate active learning, such as game-based learning activities, and appropriately utilize online engagement tools, such as breakout rooms and polls. Since interpersonal skills are some of the most important learning outcomes of IPE, find ways to build and assess interpersonal skills online. One strategy to accomplish this is to require everyone to turn their cameras on. Finally, designating one or more individuals with appropriate expertise to run the online meeting/classroom software controls can also contribute to engagement. This will ensure a smooth experience while freeing up facilitators to focus on eliciting engagement. Remember that engagement is a much more important factor for facilitator success than technology skills.

Health Sciences Programs Should Consider Utilizing Non-Clinician IPE Facilitators

In utilizing non-clinicians, they should recruit people who possess strong interpersonal skills, regardless of their professional backgrounds. Potential facilitators

include non-clinical faculty, administrative staff, instructional designers, librarians, and upper-level students. It is important to provide training to ensure they are familiar with the roles of the involved professions and the planned activity in order to help secure their success.

If it is deemed inappropriate for non-clinicians to act as facilitators of a clinically-focused activity, whether due to the institutional culture or the nature of the activity, find other ways for them to contribute. The literature review showed that librarians have a history of supporting IPE by creating web-based information guides on the topic and subscribing to journals and purchasing books on IPE (Young et al., 2016). Some other potential roles non-clinicians could fill include running the online meeting/classroom software controls or searching the literature to find resources or cases to be used in the activity. It may also be possible to consider incorporating less clinically-focused activities into the institution's IPE portfolio, such as information literacy/EBP workshops. As mentioned in the literature, these workshops would help to ensure that students from different programs have similar baseline levels of skills (Aronoff et al., 2017, p. 382) while enabling them to interact interprofessionally. Another option is interprofessional book clubs. Both of these possibilities would allow for IPE to be introduced early in the curriculum while enabling a wider range of individuals to participate as facilitators.

Non-Clinicians Should Initiate Involvement in IPE

Non-clinicians working in health sciences educational programs should consider approaching the team in charge of IPE at their institutions and offering to get involved. Educators largely feel that non-clinicians possess the needed characteristics for successful IPE facilitation and are willing to collaborate with them in this area. Make the case that

interpersonal skills and eliciting engagement are more important than a clinical background. Request appropriate training to ensure familiarity with the roles of the involved professions and the planned activity in order to help ensure success. Participating in the provision of IPE can also benefit the non-clinicians or librarians in terms of the opportunities for outreach and connections, widening and strengthening the understanding of their professional roles.

This qualitative study showed that educators recognized a wide range of knowledge, skills, and abilities needed by IPE facilitators, but viewed interpersonal skills as the most important. Participants had substantial experience with online IPE, recognizing the importance of engagement when utilizing that format. They also had considerable experience with non-clinician facilitators of IPE activities, but less with health sciences librarians. Their attitudes toward online IPE and non-clinician facilitators of IPE, including librarians, were positive, paving the way for increased involvement by non-clinicians in this area.

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Appendix A

Questionnaire Questions Mapped to Research Questions

Question Number	Questionnaire Text	Research Question Addressed
1	Which of the following most closely describes your rank?	Not applicable; Demographics only
2	Are you currently, or have you ever been, a practicing clinician (dentist, nurse, occupational therapist, optometrist, pharmacist, physical therapist, physician, physician assistant, etc.)?	Not applicable; Demographics only
3	In which clinical field did/do you primarily specialize?	Not applicable; Demographics only
4	Interprofessional education, or IPE, is defined as education that "occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes" (World Health Organization, 2010, *Framework for action on interprofessional education and collaborative practice*, p. 7). How many combined years of experience do you have with IPE, both as a learner and/or a planner/facilitator?	Not applicable; Demographics only
5	Do you recall ever participating in an IPE activity that took place fully or partially online?	4
6	You answered "Yes" to the previous question, indicating that you have participated in an IPE activity that took place fully or partially online. Think back to that experience, and please describe it, including the intended learning outcomes, learners, facilitators, and setting.	1, 4
7	Please consider the instance you described in the previous question, and describe any factors that contributed to it being a **successful** IPE activity.	1, 4
8	Please consider the same instance and describe any factors that contributed to it being an **unsuccessful** IPE activity.	1, 4

9	To what degree do you feel IPE activities that take place fully or partially online can be successful?	4
10	Please share the reasoning for your answer to the previous question.	4
11	Do you recall ever participating in an IPE activity that included non-clinician facilitator(s)? Examples of non-clinician facilitators could include, but are not limited to, administrative staff, instructional designers, or librarians.	2, 3
12	You answered "Yes" to the previous question, indicating that you have participated in an IPE activity that included non-clinician facilitator(s). Which type(s) of position(s) did they hold?	2, 3
13	In what format was the IPE activity that included non-clinician facilitator(s) held?	4
14	Think back to a time you participated in an IPE activity that included non-clinician facilitator(s). Please describe that experience, including the intended learning outcomes, learners, facilitators, and setting.	2, 3, 4
15	Please consider the instance you described in the previous question, and describe any factors that contributed to it being a **successful** IPE activity.	1, 2, 3, 4
16	Please consider the same instance and describe any factors that contributed to it being an **unsuccessful** IPE activity.	1, 2, 3, 4
17	What knowledge, skills, and abilities do you think are necessary for facilitators of **in-person** IPE activities?	1, 4

18	To what degree do you feel non-clinicians, and librarians in particular, possess the knowledge, skills, and abilities you described in the previous question?	2, 3, 4
19	What knowledge, skills, and abilities do you think are necessary for facilitators of **online** IPE activities?	1, 4
20	To what degree do you feel non-clinicians, and librarians in particular, possess the knowledge, skills, and abilities you described in the previous question?	2, 3, 4
21	Please rate your willingness to collaborate with **non-clinicians** on the facilitation of in-person and online IPE activities in the future.	2, 4
22	Please share the rationale for your level of willingness to collaborate with **non-clinicians** on the facilitation of in-person and online IPE activities in the future.	2, 4
23	Please rate your willingness to collaborate with **librarians** in particular on the facilitation of in-person and online IPE activities in the future.	3, 4
24	Please share the rationale for your level of willingness to collaborate with **librarians** in particular on the facilitation of in-person and online IPE activities in the future.	3, 4

1. What knowledge, skills, and abilities do health sciences educators deem necessary for facilitators of IPE activities?

2. What are health sciences educator experiences with and attitudes toward non-clinician facilitators of IPE activities?

3. What are health sciences educator experiences with and attitudes toward health sciences librarians in particular as facilitators of IPE activities?

4. How do these factors differ for in-person as compared to online settings?

Appendix B

Complete Questionnaire

Question Number	Question Text	Sub-question Text	Question Type	Answer Choices	Questionnaire Flow
1	Which of the following options most closely describes your rank?		Multiple choice	Assistant Professor Associate Professor Full Professor Adjunct Instructor Staff Member Librarian Administrator (Chair, Assistant/Associate Dean, Dean, etc.) Other + optional text entry	Advance to next question
2	Are you currently, or have you ever been, a practicing clinician (dentist, nurse, occupational therapist, optometrist, pharmacist, physical therapist, physician, physician assistant, etc.)?		Multiple choice	Yes No	Advance to next question Advance to question 4
3	In which clinical field did/do you primarily specialize?		Multiple choice	Dentistry Medicine Nursing Occupational Therapy Optometry Pharmacy Physical Therapy Physician Assistant Other + optional text entry	Advance to next question
4	Interprofessional education, or IPE, is defined as education that "occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes" (World Health Organization, 2010, *Framework for action on interprofessional education and collaborative practice*, p. 7). How many combined years of experience do you have with IPE, both as a learner and/or a planner/facilitator?		Multiple choice	No experience Less than 1 year of experience 1-5 years of experience 6-10 years of experience More than 10 years of experience	Advance to next question
5	Do you recall ever participating in an IPE activity that took place fully or partially online?			Yes No Not sure	Advance to next question Advance to question 9
6	You answered "Yes" to the previous question, indicating that you have participated in an IPE activity that took place fully or partially online. Think back to that experience, and please describe it, including the intended learning outcomes, learners, facilitators, and setting.		Free-text entry		Advance to next question
7	Please consider the instance you described in the previous question, and describe any factors that contributed to it being a **successful** IPE activity.		Free-text entry		Advance to next question
8	Please consider the same instance and describe any factors that contributed to it being an **unsuccessful** IPE activity.		Free-text entry		Advance to next question

9	To what degree do you feel IPE activities that take place fully or partially online can be successful?		Multiple choice; 5-Point Likert scale	Not at all Slightly Moderately Considerably A great deal	Advance to next question
10	Please share the reasoning for your answer to the previous question.		Free-text entry		Advance to next question
11	Do you recall ever participating in an IPE activity that included non-clinician facilitator(s)? Examples of non-clinician facilitators could include, but are not limited to, administrative staff, instructional designers, or librarians.		Multiple choice	Yes No Not sure	Advance to next question Advance to question 17 Advance to question 17
12	You answered "Yes" to the previous question, indicating that you have participated in an IPE activity that included non-clinician facilitator(s). Which type(s) of position(s) did they hold?		Multiple choice; Allow multiple answers	Administrative Staff Instructional Designer Librarian Other + optional text entry Unsure	Advance to next question
13	In what format was the IPE activity that included non-clinician facilitator(s) held?		Multiple choice	Fully in person A mix of in person and online Fully online	Advance to next question
14	Think back to a time you participated in an IPE activity that included non-clinician facilitator(s). Please describe that experience, including the intended learning outcomes, learners, facilitators, and setting.		Free-text entry		Advance to next question
15	Please consider the instance you described in the previous question, and describe any factors that contributed to it being a **successful** IPE activity.		Free-text entry		Advance to next question
16	Please consider the same instance and describe any factors that contributed to it being an **unsuccessful** IPE activity.		Free-text entry		Advance to next question
17	What knowledge, skills, and abilities do you think are necessary for facilitators of **in-person** IPE activities?		Free-text entry		Advance to next question
18	To what degree do you feel non-clinicians, and librarians in particular, possess the knowledge, skills, and abilities you described in the previous question?	Non-clinicians	Multiple choice; 5-Point Likert scale	Not at all Slightly Moderately Considerably A great deal	Advance to next question
		Librarians	Multiple choice; 5-Point Likert scale	Not at all Slightly Moderately Considerably A great deal	

19	What knowledge, skills, and abilities do you think are necessary for facilitators of **online** IPE activities?		Free-text entry		Advance to next question
20	To what degree do you feel non-clinicians, and librarians in particular, possess the knowledge, skills, and abilities you described in the previous question?	Non-clinicians	Multiple choice; 5-Point Likert scale	Not at all Slightly Moderately Considerably A great deal	Advance to next question
		Librarians	Multiple choice; 5-Point Likert scale	Not at all Slightly Moderately Considerably A great deal	
21	Please rate your willingness to collaborate with **non-clinicians** on the facilitation of in-person and online IPE activities in the future.	In-person	Multiple choice; 5-Point Likert scale	Unwilling Somewhat unwilling Undecided Somewhat willing Willing	Advance to next question
		Online	Multiple choice; 5-Point Likert scale	Unwilling Somewhat unwilling Undecided Somewhat willing Willing	
22	Please share the rationale for your level of willingness to collaborate with **non-clinicians** on the facilitation of in-person and online IPE activities in the future.		Free-text entry		Advance to next question
23	Please rate your willingness to collaborate with **librarians** in particular on the facilitation of in-person and online IPE activities in the future.	In-person	Multiple choice; 5-Point Likert scale	Unwilling Somewhat unwilling Undecided Somewhat willing Willing	Advance to next question
		Online	Multiple choice; 5-Point Likert scale	Unwilling Somewhat unwilling Undecided Somewhat willing Willing	
24	Please share the rationale for your level of willingness to collaborate with **librarians** in particular on the facilitation of in-person and online IPE activities in the future.		Free-text entry		Complete questionnaire

Appendix C

Data Management Plan

Plan Overview

A Data Management Plan created using dmptool

Creator: Rachel Helbing

Affiliation: University of Houston (UH)

Template: University of Houston Research Data

ORCID iD: 0000-0001-6336-1119

Project abstract:

As health sciences education experienced a major shift from primarily in-person to primarily online formats due to the COVID-19 pandemic, the provision of interprofessional education (IPE) also needed to transition. Librarians have relevant experience in health sciences education, especially in online settings; however, they have typically not been deeply involved in IPE. Health professions educators need a better understanding of the factors that help and hinder the provision of IPE, particularly as they relate to facilitators. The purpose of this study is to assess faculty views on the knowledge, skills, and abilities needed by IPE facilitators, and to explore their attitudes toward and experiences with non-clinician facilitators of online IPE activities, particularly health sciences librarians. Data will be collected via an online questionnaire adapted from critical incident technique.

Last modified: 07-31-2021

Interprofessional Education in the Health Sciences: Librarian Involvement in Online Settings

Data Types

What type of data will be collected and stored?

The data input will consist of answers to multiple choice and free text entry questions collected via Qualtrics survey software, which is a web-based survey application hosted by the University of Houston. The data output will be in the format of Excel and/or SPSS files. It is anticipated that the scale of the data will be small.

It is not anticipated that the data will contain any sensitive information with compliance needs. However, since the data will be collected from a small population, the possibility for reidentification should be considered.

Data Storage Platform

Describe the appropriate platform for storage including security components.

The data will be captured using Qualtrics survey software, which is a web-based survey application hosted by the University of Houston. The data will be downloaded into Microsoft Excel spreadsheets and saved on the University of Houston network on the PI's M drive. Analysis will be performed using SPSS and NVivo data analytics tools, both provided and hosted by the University of Houston. Security components in place for these systems include required University of Houston accounts and logins to both computers and software in order to access data.

Roles and Responsibilities

Discuss the responsibilities of data owners, IT support, and information security.

Data Owner - The Principle Investigator is Rachel Helbing. The PI will also be the sole researcher and person with access to the data. The PI will serve as information custodian.

IT Support - Marcus Elizondo serves as Systems Administrator 3 for University of Houston University Libraries, maintaining the network servers and enterprise software and systems such as Qualtrics.

Information Security - The PI will monitor and maintain information security throughout the project as the sole researcher and person with access to the data.

Storage Location

What are the locations of the data storage?

Data will be stored on the University of Houston University Libraries servers, with backup on the researcher's standalone personal laptop. The data is at Security Level 2 as designated by University of Houston System Administrative Memorandum 07.A.08 and will require user ID and password to be accessed.

Access

How and by whom will access to data be controlled?

Access to the M drive is limited to the individual employee via a user ID and password. It can also be granted to Library Technology Services employees via remote login for the purpose of troubleshooting and assistance.

How will physical access to the system be controlled?

The University of Houston University Libraries servers are located in a locked room with card swipe access by Library Technology Services staff only.

Security and Back-ups

Describe the type of anti-virus controls the system will have.

This project will utilize the University of Houston's standard protection and anti-virus systems on the university network.

What is the process of digital back-ups for recovery purposes?

Backup will be completed on the PI's personal laptop at least weekly throughout the research project.

Non-Digital Storage

What is the process for storing materials that are not digital?

It is not anticipated that the data will include any materials that are not digital.

Preservation and Archiving

Describe the environment where data will be archived

Data will be archived in the Texas Data Repository through the UH Data Repostory. TDR provides basic, bit-level preservation and ensures ongoing access to research data, including associated metadata and documentation, for a minimum of ten years post deposit. All digital content is copied nightly with versioning and kept for one year (individual files); content from the entire service is copied nightly as a snapshot and kept for one month. TDR also provides access control, network monitoring and protection, encryption, and system updates.

Who will have access to archived data?

No restrictions will be placed on data access.

How long will data be archived?

Data will be archived for a period of at least three (3) years after submission of the final report on this study.

Data Sharing

What components of your data will you share?

The data outputs, minus any potential identifying data points such as participants' IP addresses, will be shared in aggregate, along with the data analysis outputs. This will help to prevent reidentification of the data.

How and when will you share?

Following consultation with Reid Boehm at University of Houston Libraries, I plan to deposit my research data in the Texas Data Repository (TDR). I will provide the necessary metadata and other resources to make those data accessible and to enable their reuse. TDR is a web-accessible and widely indexed Dataverse repository hosted by the Texas Digital Library and managed by the University of Houston. TDR provides persistent, citable URLs via Digital Object Identifiers (DOIs), searchable metadata, full-text indexing, and preservation of content.

Is there potential intellectual property to protect?

It is not anticipated that the data will include intellectual property to protect.

If any components of your data have sensitive information, what methods will you take to ensure compliance with policies as you share it?

It is not anticipated that the data will include sensitive information. However, participant IP addresses will be removed, and data will be shared in aggregate only in order to avoid the possibility for reidentification.

Planned Research Outputs

Dataset - "Interprofessional Education in the Health Sciences: Librarian Involvement in Online Settings"

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
Interprofessional Education in the Health Sciences ...	Dataset	2022-05-16	Open	Texas Data Repository		Creative Commons Attribution 4.0 International	None specified	No	No

Appendix D

Institutional Review Board Approval

UNIVERSITY of HOUSTON
DIVISION OF RESEARCH
Institutional Review Boards

APPROVAL OF SUBMISSION

October 14, 2021

Rachel Helbing
4333 University Drive
Room 108
Houston, TX 77204

713-743-5462
rrhelbing@uh.edu

Dear Rachel Helbing:

On October 14, 2021, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	Non-Clinician Facilitators of Interprofessional Health Sciences Education in Online Settings
Investigator:	Rachel Helbing
IRB ID:	STUDY00003316
Funding/ Proposed Funding:	Name: Curriculum & Instruction
Award ID:	
Award Title:	
IND, IDE, or HDE:	None
Documents Reviewed:	• HelbingRecruitmentEmail.pdf, Category: Recruitment Materials; • HelbingHRP-502e.pdf, Category: Consent Form; • Online IPE, Category: IRB Protocol; • HelbingQuestionnaire.pdf, Category: Study tools (ex: surveys, interview/focus group questions, data collection forms, etc.); • HelbingHRP-411.docx, Category: Completed Checklists;
Review Category:	Exempt
Committee Name:	Not Applicable
IRB Coordinator:	Sandra Arntz

The IRB approved the study on October 14, 2021 ; recruitment and procedures detailed within the approved protocol may now be initiated.

UNIVERSITY of HOUSTON
DIVISION OF RESEARCH
Institutional Review Boards

As this study was approved under an exempt or expedited process, recently revised regulatory requirements do not require the submission of annual continuing review documentation. However, it is critical that the following submissions are made to the IRB to ensure continued compliance:

- Modifications to the protocol prior to initiating any changes (for example, the addition of study personnel, updated recruitment materials, change in study design, requests for additional subjects)
- Reportable New Information/Unanticipated Problems Involving Risks to Subjects or Others
- Study Closure

Unless a waiver has been granted by the IRB, use the stamped consent form approved by the IRB to document consent. The approved version may be downloaded from the documents tab.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system.

Sincerely,

Research Integrity and Oversight (RIO) Office
University of Houston, Division of Research
713 743 9204
cphs@central.uh.edu
http://www.uh.edu/research/compliance/irb-cphs/

Appendix E

Consent Form

UNIVERSITY of HOUSTON
A CARNEGIE-DESIGNATED TIER ONE PUBLIC RESEARCH UNIVERSITY

Consent to Take Part in a Human Research Study

Title of research study: *Non-Clinician Facilitators of Interprofessional Health Sciences Education in Online Settings*

Investigator: Rachel Helbing. This project is part of a doctoral thesis being conducted under the supervision of Dr. Robert Hausmann.

Key Information:

The following focused information is being presented to assist you in understanding the key elements of this study, as well as the basic reasons why you may or may not wish to consider taking part. This section is only a summary; more detailed information, including how to contact the research team for additional information or questions, follows within the remainder of this document under the "Detailed Information" heading.

What should I know about a research study?

- Someone will explain this research study to you.
- Taking part in the research is voluntary; whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide, and can ask questions at any time during the study.

We invite you to take part in a research study about interprofessional education because you meet the following criteria: you have involvement and/or interest in interprofessional education, and you are 18 or older.

In general, your participation in the research involves completing a single online questionnaire.

There are no known risks for taking part in this study. There is no personal benefit for taking part, however the possible benefit to society may be an improved understanding of interprofessional education and strategies to increase its adoption. You will not receive compensation for participation.

Detailed Information:

The following is more detailed information about this study, in addition to the information listed above.

Why is this research being done?

This research is being done to learn more about views on the knowledge, skills, and abilities needed by the people who facilitate interprofessional education activities. It will also explore attitudes and

experiences with non-clinician and librarian facilitators of interprofessional education activities that take place online.

How long will the research last?

We expect that you will be in this research study for no more than 30 minutes.

How many people will be studied?

We expect to enroll about 40 people in this research study.

What happens if I say yes, I want to be in this research?

If you agree to take part in this research, you will complete an online questionnaire consisting of a mix of multiple choice and free-text entry questions. It should take no more than 30 minutes to complete.

What happens if I do not want to be in this research?

You can choose not to take part in the research and it will not be held against you. Choosing not to take part will involve no penalty or loss of benefit to which you are otherwise entitled.

What happens if I say yes, but I change my mind later?

You can leave the research at any time and it will not be held against you.

If you stop being in the research, already collected data will not be removed from the study record.

Is there any way being in this study could be bad for me?

There are no foreseeable risks related to the procedures conducted as part of this study. If you choose to take part and undergo a negative event you feel is related to the study, please inform your study team.

Will I get anything for being in this study?

You will not receive anything for being in this study.

Will being in this study help me in any way?

There are no known benefits to you from your taking part in this research. However, possible benefits to society may include an improved understanding of interprofessional education and strategies to increase its adoption.

What happens to the information collected for the research?

Your taking part in this project is anonymous, and information you provide cannot be linked to your identity.

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, you should talk to the research team at (713) 743-5462 or rrhelbin@central.uh.edu.

This research has been reviewed and approved by the University of Houston Institutional Review Board (IRB). You may also talk to them at (713) 743-9204 or cphs@central.uh.edu if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.

- You want to talk to someone besides the research team.
- You have questions about your rights as a research subject.
- You want to get information or provide input about this research.