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Systemic, Institutional, and Teaching Factors in the Delivery of Interprofessional Education Curriculum in Canada

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Abstract

The Canadian federal and several provincial governments are currently collaborating to establish 'team-based' primary healthcare—or interprofessional collaborative practice (IPCP), which can be effectively accomplished when interprofessional education (IPE) is sustainably delivered by health and social care (HASC) professional education programs. Indeed, achieving the intended patient/client-oriented outcomes of IPE and subsequent IPCP requires deliberate and purposeful considerations of several systemic, institutional, and teaching factors. Regrettably, the analyses of the extent to which these factors have influenced effective IPCP is currently under-researched. In this integrated-article dissertation, we took a purposeful and systematic approach to explore the extent to which these multi-tiered factors influence effective IPCP in the Canadian context. First, we conducted a systematic review (Chapter 2) to familiarize ourselves with and explore *when* and *where* IPE has been implemented over the past decade (2010–2020). Next, we conducted a comparative document analysis (Chapter 3) of Canadian HASC professional accreditation standards documents, through which we evaluated the *accountability* of interprofessional-relevant accreditation standards—to which accrediting organizations can hold their respective academic programs *accountable*. These two research studies revealed three major research gaps: (1) that most IPE initiatives lacked the use of theoretical/conceptual frameworks; (2) that the IPE-relevant accreditation standards overwhelmingly emphasized *Students* and *Educational Program* domains, thereby potentially compromising the sustainability of IPE; and (3) that longer IPE initiatives with greater intensity and more rigorous methodological and assessments methods are warranted. To address the first research gap, we present a conceptual paper (Chapter 4) in which we discussed the importance of curriculum and learning theories to HASC professional education processes and proposed a theoretical framework for productive engaged learning, through which IPE opportunities may be grounded. To address the second and third research gaps, we explored the integration of IPE curriculum models in the programmatic structures at four, large Canadian post-secondary institutions (Chapter 5). We further explored the enablers, barriers/challenges, limitations, and outcomes of these curriculum models, as perceived by IPE facilitators and preceptors and whether they truly lead to effective IPCP (Chapter 6). This research reinforces global and national efforts to promote sustainable IPE with aim to improve patient/client-centred care.

Keywords

Higher education, interprofessional education, interprofessional collaborative practice, health and social care professions, prelicensure education, accreditation, competency-oriented curriculum, systematic review, document analysis, embedded single-case study, Canada

Summary for Lay Audience

The Canadian federal and several provincial governments are currently collaborating to establish 'team-based' primary healthcare—or interprofessional collaborative practice (IPCP), which is evidenced, for instance, when a physician, nurse, physical therapist, and pharmacist collaboratively apply their interprofessional knowledge, skills, and dispositions to execute personalized plans to diagnose, treat, and manage a patient's illness or condition. Over the last few decades, this IPCP approach has increasingly become necessary to address the heavy demands on global HASC delivery systems due factors including evolving epidemiological profiles, growing ageing populations, climate change, health inequity, shifting migration (mobility) patterns, and rising healthcare costs. Optimally, HASC practitioners should be effectively trained and prepared for IPCP before they are licensed/certified to practice. As such, IPCP can be effective when students enrolled in health and social care (HASC) professional education programs are brought together to learn with, from, and about each other during interprofessional education (IPE). Indeed, achieving the intended patient/client-oriented outcomes of IPE and subsequent IPCP requires deliberate and purposeful considerations of several systemic (macro-level), institutional (meso-level), and teaching (micro-level) factors. Macro-level factors include adoption of common interprofessional language across HASC professions. Meso-level factors include fulfillment of interprofessional-relevant accreditation standards by respective HASC professional degree programs. Micro-level factors include the design, implementation, and continual evaluation of a theoretically informed and scaffolded IPE curriculum. Regrettably, the analyses of the extent to which these factors have collectively influenced effective IPCP is currently under-researched. In this dissertation, we aimed to understand the IPE milieu in Canada through an initial systematic review of IPE initiatives (Chapter 2), followed by a document analysis of Canadian HASC professional accreditation standards documents (Chapter 3), a conceptual paper that proposed a theoretical framework through which IPE initiatives may be grounded (Chapter 4), and explored the enablers, barriers/challenges, and outcomes of integrated IPE curriculum models at four post-secondary institutions in Canada (Chapters 5 and 6). This research has been prioritized by the Global Confederation for Interprofessional Education and Collaborative Practice and complements the promotion of IPE and IPCP by the World Health Organization and the Canadian federal and provincial governments with aim to improve patient/client-centred care.

Statement of Co-Authorship

This dissertation is submitted for the degree of Doctor of Philosophy at Western University in London, Ontario, Canada. The research described herein was conducted under the supervision of Dr. Anton Puvirajah in the Academic Research Cluster (ARC) of Curriculum Studies and Studies in Applied Linguistics in the Faculty of Education, between September 2019 and July 2023.

This dissertation is written in integrated-article format, in which the chapters (2 through 6) present discrete but related research studies. Collectively, these research studies achieve an integration of information. Further, these chapters include content that was result of joint research conduct and publication for which I was the principal contributor (see details below). Due to the repetitive nature of some of the content presented throughout this dissertation, please note that Background section of each chapter has been shortened to avoid redundancy. Lastly, all references are cited at the end of this dissertation.

Chapter 2 (systematic review) of this dissertation includes the outcome of publication which has the following other co-authors: Julia Ranieri and Anton Puvirajah. My contributions to the work (80%) include the key ideas, primary contributions, literature review, search of electronic databases, export of all articles for screening, data analysis, interpretation, creation of figures, overall design, and writing of this article. Anton contributed to the development of the inclusion and exclusion criteria, search strategy, and data extraction criteria. Julia contributed to screening of titles, abstracts, and full texts, negotiating final inclusion of studies, and extracting and analyzing data. All co-authors approved the final manuscript. This publication can be found here:

Azzam, M. B., Ranieri, J., & Puvirajah, A. (2022). Interprofessional education in prelicensure health and social care professions education: A systematic review. *Health, Interprofessional Practice and Education*, *4*(3), eP2186. https://doi.org/10.7710/2641-1148.2186

Chapter 3 (document analysis) of this dissertation includes the outcome of publication which has the following other co-authors: Anton Puvirajah, Marie-Andrée Girard, and Ruby E. Grymonpre. My contributions to the work (80%) include the key ideas, primary contributions, literature review, data analysis, interpretation, creation of figures, overall design, and writing of this article. Ruby and Marie-Andrée provided expertise in the fields of interprofessional education accreditation and regulation, respectively. Marie-Andrée also conducted the search of professions according to eligibility criteria. Anton and Ruby contributed to scanning of accreditation standards documents and extracting and analyzing data. All co-authors approved the final manuscript. This publication can be found here:

Azzam, M., Puvirajah, A., Girard, M.-A., & Grymonpre, R. E. (2021). Interprofessional education-relevant accreditation standards in Canada: A comparative document analysis. *Human Resources for Health*, *19*(1), 66–66. https://doi.org/10.1186/s12960-021-00611-1

Chapter 4 (conceptual paper) of this dissertation includes the outcome of publication which has the following other co-author: Anton Puvirajah. My contributions to the work (80%) include the key ideas, primary contributions, literature review, creation of figures, overall design, and writing of this article. Anton provided curriculum studies and curriculum theory expertise. Anton approved the final manuscript. This publication can be found here:

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Chapter 5 (comparative analysis) of this dissertation includes the outcome of publication which has the following other co-authors: Donna Drynan, Moni Fricke, Sylvia Langlois, Laura MacDonald, Marie-Claude Vanier, and Anton Puvirajah. My contributions to the work (80%) include the key ideas and conceptualization, primary contributions, literature review, methodology, data curation, data analysis, creation of figures, overall design, and writing, reviewing, and editing the manuscript. All other co-authors helped with conceptualization, methodology, and validation of data, and reviewed and edited the manuscript. All co-authors approved the final manuscript. This publication can be found here:

Azzam, M. B., Drynan, D., Fricke, M., Langlois, S., MacDonald, L., Vanier, M.-C., & Puvirajah, A. (In Press). A comparative analysis of integrated interprofessional education curriculum models at four Canadian post-secondary institutions. *Journal of Research in Interprofessional Practice and Education*.

Chapter 6 (case study) of this dissertation will include the outcome of publication which will have the following other co-author: Anton Puvirajah. My contributions to the work (80%) include the key ideas and conceptualization, primary contributions, literature review, methodology, data collection, data analysis, overall design, and writing, reviewing, and editing the manuscript. Anton helped with conceptualization, methodology, and validation of data, and will review, edit, and approve the manuscript.

Lastly, I declare that, to the best of my knowledge, this work is original, except where acknowledgements and references are made to published work. I declare that, to the best of my knowledge, this dissertation does neither infringe upon anyone's copyright nor violate any proprietary rights. I declare that this a true copy of my dissertation, including any revisions, as approved by my Thesis Advisory Committee and the Graduate Programs Office and that neither this dissertation, nor any substantially similar dissertation, has been or is being submitted for any other degree, diploma, or other qualification at any other institution.

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List of Abbreviations

ABM	Agent-based modeling
ACFD	Association of Canadian Faculties of Dentistry
ACOTRO	Association of Canadian Occupational Therapy Regulatory Organizations
ACOTUP	Association of Canadian Occupational Therapy University Programs
AFMC	Association of Faculties of Medicine of Canada
AIPHE	Accreditation for Interprofessional Health Education
CACHE	Centre for Advancing Collaborative Healthcare and Education
CAIPE	Centre for the Advancement of Interprofessional Education
CAOT	Canadian Association of Occupational Therapists
CCSP	Clinical, Counselling, and School Psychology
CDAC	Commission on Dental Accreditation of Canada
CFCREAB	Canadian Federation of Chiropractic Regulatory and Education Accrediting Boards
CIHC	Canadian Interprofessional Health Collaborative
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CIO-UM	Interfaculty Operational Committee
CIPE	Centre for Interprofessional Education
CNP	Clinical Neuropsychology
CPA	Canadian Psychological Association
DCPP	Office of Collaboration and Patient Partnership
ehpic™	Educating Health Professionals in Interprofessional Care FDHRC
ERIC	Education Resources Information Center
FAIMER	Foundation for Advancement of International Medical Education and Research
FDHRC	Federation of Dental Hygiene Regulators of Canada
HASC	Health and Social Care
HHRS	Health Human Resources Strategy
HPCS	Health Professional Collaboration Scale
ICAR	Interprofessional Collaborator Assessment Rubric
ICCAS	Interprofessional Collaborative Competency Attainment Scale

ICDEP	Integrated Competencies for Dietetic Education and Practice
IECPCP	Interprofessional Education for Collaborative Patient-Centred Practice
IEPS	Interdisciplinary Education Perception Scale
IP.G	Global Confederation for Interprofessional Education and Collaborative Practice
IPCA	Interprofessional Collaborator Assessment
IPCP	Interprofessional Collaborative Practice
IPE	Interprofessional Education
IRPbc	Interprofessional Rural Program of British Columbia
ISVS	Interprofessional Socialization and Valuing Scale
NCCIH	National Collaborating Centre for Indigenous Health
NEC	National Expert Committee
NHWA	National Health Workforce Accounts
NPAG	National Physiotherapy Advisory Group
OIPC	Office of Interprofessional Collaboration
PDEP	Partnership for Dietetic Education and Practice
PICOS	Population, Intervention, Comparison, Outcomes, and Study Design
PRISMA	Preferred Reporting Items for Systematic Review and Meta-Analysis
PRISMA-P	Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols
PROSPERO	International Prospective Register of Systematic Reviews
RCPSC	Royal College of Physicians and Surgeons of Canada
RIPLS	Readiness for Interprofessional Learning Scale
UBC	University of British Columbia
UdeM	Université de Montréal
UofM	University of Manitoba
UofT	University of Toronto
UWE-IPQ	University of West of England Interprofessional Questionnaire
WHO	World Health Organization

List of Nomenclature

Accreditation	"Formal process by which a recognized body … assesses and recognizes that a [HASC] organization meets applicable pre-determined and published standards. Accreditation standards are usually regarded as optimal and achievable and are designed to encourage continuous improvement efforts within accredited organizations" (World Health Organization, 2011, p. 1).
Case study	"An empirical method that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (Yin, 2018, p. 50).
Classification	"The degree of boundary maintenance between [disciplines]" (Bernstein, 1996 p. 158).
Competency	"An observable ability of a [HASC] professional, integrating multiple components such as knowledge, skills, values, and attitudes" (Frank et al., 2010, p. 641).
Conceptual framework	"The justification for why a given study should be conducted. The conceptual framework (1) describes the state of known knowledge, usually through a literature review; (2) identifies gaps in our understanding of a phenomenon or problem; and (3) outlines the methodological underpinnings of the research project" (Varpio et al., 2020, p. 990).
Curriculum	"All the activities, experiences and learning opportunities for which an institution or a teacher takes responsibility--either deliberately or by default" (Fish & Coles, 2005). "What is successfully conveyed to differing degrees to different students, by committed teachers using appropriate materials and actions, of legitimated bodies of knowledge, skill, taste, and propensity to act and react, which are chosen for instruction after serious reflection and communal decision by representatives of those involved in the teaching of a specified group of students who are known to the decision makers" (Schwab, 1983, p. 240). "An attempt to communicate the essential principles and features of an educational proposal in such a form that it is open to critical scrutiny and capable of effective translation into practice" (Stenhouse, 1975, p. 4).
Health and social care professions	The health and social care professions comprise those professions that are mainly involved with treating and improving individuals' physical health, mental health, dental health, and ocular health (World Health Organization, 2006b).
Interprofessional education	"Occasions when members or students of two or more professions learn with, from and about each other to improve collaboration and the quality of care and services" (Centre for the Advancement of Interprofessional Education, 2016, p. 1).

Interprofessional collaborative practice	"[Occasions when] multiple [HASC] workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across settings" (WHO, 2010, p. 13).
Learning theory	"[A] coherent framework of integrated constructs and principles that describe, explain or predict how people learn" (Braungart et al., 2014, p. 71).
Paradigm	"The net that contains the researcher's ontological, epistemological, and methodological premises" (Guba, 1990, p. 13).
Psychological Safety	"[When team members] "feel comfortable sharing concerns and mistakes without fear of embarrassment or retribution. They are confident that they can speak up and won't be humiliated, ignored, or blamed. They know they can ask questions when they are unsure about something. They tend to trust and respect their colleagues" (Edmondson, 2019).
Theoretical framework	A "logically developed and connected set of concepts and premises—developed from one or more theories—that a researcher creates to scaffold a study" (Varpio et al., 2020, p. 990).

Chapter 1

1 Introduction

This integrated-article dissertation presents several research studies that collectively aimed to understand the interprofessional education within health and social care (HASC)[1] professional degree programs in Canada. During the early 1960s, the vision to implement interprofessional education with aim to lead to effective interprofessional collaborative practice and ultimately improved patient/client-centred emerged. This sentiment was first proposed in 1964 by Dr. John McCreary—Dean of Medical School at the University of British Columbia—who stated that students from diverse HASC professional backgrounds "should be brought together during their undergraduate training years, taught by the same teachers, in the same classrooms and on the same patients" so that it would be possible that these students "be welded into a true team such that each can contribute, with full respect for what the other has to offer, [their] share of the [HASC] services" (p. 1220). Since and over the last six decades, McCreary's sentiment has increasingly been shared by many HASC practitioners, academics, and scholars—including myself.

1.1 Positionality and Philosophical Assumptions

Human. Non-disabled. Straight. Male. Young adult. Arab. Muslim. Immigrant. Naturalized Canadian. Upper-middle class citizen. Anatomist. Educational researcher. Each of these identities, among many others, constitutes one reality. There is no doubt that these

[1] The World Health Organization (2006b) posits that the *health and social care professions* comprise those professions that are mainly involved with treating and improving individuals' physical health (e.g., medicine, nursing, physical therapy, occupational therapy, pharmacy), mental health (e.g., social work, psychology), dental health (e.g., dentistry, dental hygiene), and ocular health (e.g., optometry).

realities, which intersect and collectively embody what constitutes 'Mo,' manifest themselves in my conduct, actions, personality, intellectual processes, and view of the world.

My multiple realities, which I have outlined above, have influenced the trajectory I have chosen during my doctoral research study. I come from a family which most of its members have careers in the HASC professions. This influenced me to focus my undergraduate education in the sciences and consider medicine as a career path. It was not until my graduate education that I changed my focus from clinical practice to academia. Moreover, I come from a Science Education background with an emphasis on Anatomical Education. This provided me with the opportunities to deliver guest lectures and facilitate laboratory sessions for undergraduate, graduate, and professional students enrolled in Anatomy courses. Additionally, these opportunities provided me with the platform to interact with students of several HASC professions. I have had conversations, on numerous occasions, with these students and concluded that they had an underdeveloped understanding of their professional roles and those of other HASC professions. Some of them also had no respect or trust for other professions. These dispositions struck me, as I knew that these students participate in interprofessional team-based sessions where they learned with, from, and about each other, as mandated by their programs' accrediting organizations. It appeared to me, through discussions with these students, that they were not learning with, from, and about each other—a personal bias based on previous observations, which I attempted to minimize to the extent that it doesn't interfere with my research. For the reasons described above, I decided to embark on this scholarly journey to investigate the impacts of interprofessional education initiatives on the student preparedness for interprofessional collaborative practice in the clinical workplace.

To conduct the *mostly* qualitative research presented in this dissertation, I situated myself within the constructivist paradigm (Dewey, 1916, 1938; Piaget, 1936; Vygotsky,

1978)—through which we, as humans, create meaning of both our social experiences (e.g., relationships and events) and the physical world (e.g., biological and natural) around us. It is *meaning-making* that allows us to view the meta-patterns exhibited in this world; these meaning-making processes are crucial, for such phenomena are insignificant to us unless we observe them, understand them, and make meaning of them (Bateson, 1979). Such meaning-making processes usually occur simultaneously; hence, the world is *multilayered* (Kreitler & Kreitler, 1972). For example, someone who encounters a devastating earthquake at home will definitely make meaning of such an event; concurrently, they make meaning of the death of their loved ones and the destruction of their house. Another person undergoing a different experience during the same event may make different meaning of the earthquake and its aftermath. A third person who lives halfway across the Earth may not make meaning of it at all—after all, they were not there, and it probably did not affect them in any way.

The most popular paradigms which underlie qualitative and quantitative methods are constructivism and positivism, respectively (Lincoln et al., 2011). Guba (1990) defines a *paradigm* as "the net that contains the researcher's ontological, epistemological, and methodological premises," (p. 13). Positivism emphasizes a naive realist ontology—that there exists a single reality which can be fully understood as true (Lincoln et al., 2011) through empirical evidence. Thus, positivism adopts an objectivist epistemology, which asserts that knowledge is acquired through reason—the cognitive ability which allows us, as humans, to understand the world using abstraction and logical rationale (Rand, 1982). In addition, positivists believe in the scientific method and therefore employ quantitative approaches to research, usually in the form of experiments or surveys (Lincoln et al., 2011). In these ways, positivism relies on facts as opposed to values, where the facts are free of contamination (i.e., subjective interpretation; Durkeim, 1965). Hence, positivists deny that their biases, if any,

impose any implications on their research. In other words, in the positivists' view, the researcher is believed to be completely independent of the researched (e.g., participants).

Since the early 1900s, the implications of these propositions—neutrality, objectivity, and bias-free—led many researchers to reject the positivist paradigm. I, myself, draw on what I had learned in undergraduate physics courses to argue against positivism. Physics teaches us that the mere observation of a phenomenon can influence a change in that very phenomenon—what is known as the observer effect (de Bianchi, 2013). For example, when a tire pressure gauge (i.e., the observer) is used to measure the tire pressure (i.e., the observed) of a car, some air is released from the tire; therefore, the tire pressure is inevitably altered. This example demonstrates how a non-human entity affects, by necessity, another non-human entity. If this theory holds true, then how can emotional beings such as human educational researchers have no impact on other humans (the researched), especially when the interaction between them is usually much more than a mere presence (observation)?

Making use of the rhetorical question stated above, I subscribe to the post-positivist paradigm when conducting quantitative research. If I were to draw on my educational background in undergraduate physics once again, I would argue for Heisenberg's (1958) principle of indeterminacy, which asserts that we cannot determine the true meaning of any single phenomenon—a positivist proclamation. Nonetheless, positivism continued to be the "gold standard of educational research" (Wright, 2006, p. 800) within the scientific community until post-positivism gained recognition in the 1970s. Post-positivist researchers believe that their participants have multiple perspectives (Creswell & Poth, 2018); thus, they emphasize a critical realist ontology as well as an objectivist epistemology—that reality can be understood only imperfectly and probabilistically (Lincoln et al., 2011). In addition, post-positivists believe in the scientific method, but unlike positivists, they can use both quantitative and qualitative approaches to research (Lincoln et al., 2011). Hence, post-positivists acknowledge that

although some of their biases can be minimized, some are inevitable, and therefore attempt to limit their interactions with their participants (Denzin & Lincoln, 2011).

It was not until the paradigm war during the 1980s that qualitative approaches to education, underlaid within the constructivist paradigm (Lincoln et al., 2011), gained recognition. This war eventually resulted in "the serious crippling of quantitative research in education," (Denzin & Lincoln, 2011, p. 1). Constructivism emphasizes a relativist ontology—that there exist *local*, *specific*, *constructed* realities," (Lincoln et al., 2011), which can be studied using an emergent research design and an inductive reasoning process (Merriam & Tisdell, 2016). Thus, constructivism adopts a subjectivist epistemology, which maintains that such constructs can neither be quantified nor generalizable (Coe, 2017). This is why qualitative researchers employ methods which provide rich, thick descriptions of the localized and situated researched. Furthermore, qualitative researchers acknowledge their subjectivity in interpreting the findings and in formulating their conclusions (Holmes, 2014) because they are, indeed, the primary instruments for data collection and analysis (Patton, 2015). In this way, qualitative research is hermeneutic and dialectic (Lincoln et al., 2011), whereby findings are allowed to unfold naturally (Merriam & Tisdell, 2016).

Thus far, I've discussed how qualitative and quantitative approaches to educational research are inherently distinct. Nonetheless, with each group bringing distinctive qualities to the research process, I believe that these two approaches complement one another. In so doing, I infer that quantitative statistically significant results found in an initial focus on generalizability and outcomes can draw attention to the development of a new focus for an in-depth qualitative description of the meaning-making processes (i.e., explanatory sequential), and vice versa (i.e., exploratory sequential). Indeed, "no single method can grasp the subtle variations in ongoing human experience," (Denzin & Lincoln, 2011, p. 12). The interplay which results from the integration of both qualitative and quantitative approaches

"can bring accounts of social phenomena to progressively greater levels of clarity," (Cupchik, 2001, para. 33). As a result, I find no incompatibility between qualitative and quantitative research methods and therefore reject the *incompatibility thesis* (Teddlie & Tashakkori, 2003), which visualizes that quantitative and qualitative approaches in terms of polarity and being incompatible, rather than being complementary and compatible.

As implied above, I am generally a mixed-methods researcher. Thus, neither post-positivism nor constructivism on its own completely informs all my research. Hence, I subscribe to the constructivist realism ontology (Cupchik, 2001) to justify my pragmatic epistemology (Murphy, 1990) and emergent methodology (Koro-Ljungberg et al., 2009). Constructivist realism integrates the best of post-positivism and constructivism, and therefore acknowledges that social phenomena exist independent of my scholarly discipline. This paradigm can be further supported by social constructivism, symbolic interactionism, and phenomenology.

Constructivism can be divided into two main components: cognitive constructivism and social constructivism, both of which are important when researching in the interprofessional collaboration context. Cognitive constructivism, on one hand, interprets how learning occurs from a neurodevelopmental perspective (Dewey, 1966; Piaget & Cook, 1952). Social constructivism, on the other hand, interprets how learning occurs within one's social environment, where social interactions help shape one's knowledge base (Vygotsky, 1978, 1986). Furthermore, it is through these interactions with others that individuals engage in the meaning-making process (Creswell & Poth, 2018). Both theories are extremely important when attempting to understand how students engaged in interprofessional education make meaning of their experiences and dispositions.

The concept of meaning-making is particularly paramount to learning. Embedded within any HASC professional education program exist many dispositions and practices that are territorial, hierarchical, and stereotypical in nature (Braithwaite et al., 2016). Such habits are deeply rooted within the professionalization discourses and socialization processes in the HASC professions. Hence, how HASC professional students make meaning of their own professions and other professions, and how they make meaning of their interactions with students of their own professions and other professions, influences their own learning experiences and their dispositions towards team-based collaboration.

In addition, the meaning-making processes can further be explained using the sociological theory of symbolic interactionism, first alluded to by George Mead. Mead (1934) believed that people first assign meanings to their social and physical phenomena and then decide how to act. Mead focused his efforts on understanding collective (i.e., team) perceptions (Reeves et al., 2008). Herbert Blumer, who first coined the term *symbolic interactionism* (1969), proposed that it constitutes of three guiding assumptions. I'll explain these assumptions using the following example. Let's say that I got tired while hiking in the park and decided to rest under the shade of a tree. Blumer's first assumption is that "human beings act toward things on the basis of the meanings that the things have for them," (p. 2). To me, the tree resembles a peaceful shelter that shields me from the scorching sun; hence, I decided to lay in its shade. It is important to note that every one of us ascribes different meanings to trees. Therefore, "the meaning of such things is derived from, or arises out of, the social interaction that one has with one's fellows [in a society]," (p. 2). In retrospect, others may believe that the tree resembles fertility; a third group of people may believe that it symbolizes spiritual nourishment; and yet, a fourth group may feel disgust for trees as they are usually infested by insects (i.e., bees and ants). Carrying on with the example above, let's say that while sitting against the tree, I feel that I were stung by a bee. At this very moment, I

am likely to modify my original meaning of the tree to include 'with a chance of being stung.' This is summed up by Blumer's last assumption, that "these meanings are handled in, and modified through, an interpretative process used by the person in dealing with the things [they] encounters," (p. 2).

In addition to symbolic interactionism, I can use phenomenology in my research. Developed by Edmund Husserl, phenomenology is a philosophical theory that explores "the essence of [subjective] consciousness as experienced from the first-person point of view," (Smith, 2007). While symbolic interactionism focuses on collective perceptions, phenomenology focuses on individual perceptions.

Both phenomenology and symbolic interactionism inform my research in that I can use them to explore the meanings health professions students have for each other and for the social interactions with one another. Furthermore, I will explore whether interprofessional education experiences modify such meanings. To achieve this, I will conduct semi-structured interviews with faculty from several health professions and will analyse the data inductively. Conducting such interviews is not an easy task, as qualitative researchers need to work the *hyphen* (Fine, 1994). After all, the researcher-researched relationship is flexible and bilateral (Hsiung, 2010). I visualize the hyphen to symbolize a rope, where my participants and I are playing a game of tug-of-war. By that, I mean that I will have to keep my distance from the participants when conducting the research, even if I have personal relationships with them. In so doing, I hold myself accountable, whereby I loosen and tighten the rope, as needed. In addition, it is vital to acknowledge that my personal and educational backgrounds, as well as my subjective interpretations, indicate that I come from a "distinct interpretive community" (Denzin & Lincoln, 2011, p. 11). Hence, it is important that I situate myself and inform my participants of my positionality (Koro-Ljungberg et al., 2009). Furthermore, I will deploy multiple methods of data collection to triangulate my data and perhaps construct different

kinds of analyses (Weis & Fine, 2000). For example, I will ask my participants to read and approve their interview transcripts. Lastly, I will set speed bumps (Weis & Fine, 2000) that will make me pause and reflect on my ethical and methodological concerns and make any necessary corrective changes.

In conclusion, I can neither solely identify as a post-positivist nor as a constructivist, for I view them as complementary to one another. I continue to argue that these paradigms, and the research approaches which they underlie, are non-binary and do exist along a continuum. I do acknowledge, however, that my positionality is not static and is, indeed, constantly shifting. Perhaps, that in the future, my paradigm slightly changes with my research questions—after all, I am pragmatic. Nonetheless, today, I celebrate the many realities which define who I am, and which brought me to this very inquiry.

1.2 Interprofessional Collaborative Practice

The Canadian federal and several provincial governments are currently collaborating to establish 'team-based' primary healthcare—or *interprofessional collaborative practice* (IPCP), which is defined by the World Health Organization (WHO, 2010) as occasions when "multiple [HASC] workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across settings" (p. 13). IPCP is evidenced, for instance, when a physician, nurse, physical therapist, and pharmacist collaboratively apply their interprofessional knowledge, skills, and dispositions to execute personalized plans to diagnose, treat, and manage a patient's illness or condition.

Over the last few decades, this IPCP approach has increasingly become necessary to address the heavy demands on global HASC delivery systems due factors including evolving epidemiological profiles, growing ageing populations, climate change, health inequity, shifting

migration (mobility) patterns, and rising healthcare costs (Campbell et al., 2014; Cox et al., 2016; WHO, 2006a, 2006b, 2010). Recent global public health crises, such as the COVID-19 pandemic, have only further exposed HASC delivery systems worldwide for their weaknesses and deficiencies in effectively addressing the current needs of their patient populations (Tabish, 2020). These factors are also exacerbated by global shortages in HASC practitioners, with projections estimating a global deficit of approximately 15 million practitioners by 2030 (Liu et al., 2017).

Poor IPCP has been shown to adversely impact the provision of HASC (Reeves et al., 2017; Vestergaard & Nørgaard, 2018). Optimally, HASC practitioners should be effectively trained and prepared for IPCP before they are licensed/certified to practice. As such, coordinated planning and collaborative partnerships among the multi-tiered sectors comprising the HASC professional degree programs, HASC delivery systems, and health policymaking are warranted. One innovative pedagogical approach that has potential to lead to effective IPCP is through the sustainable delivery (development, implementation, and evaluation) of interprofessional education (Grymonpre et al., 2016a).

1.3 Interprofessional Education

Interprofessional education (IPE) is defined by the Centre for the Advancement of Interprofessional Education (CAIPE, 2016) as "occasions when students of two or more [HASC] professions learn with, from, and about each other to improve collaboration and the quality of care and services" (p. 19). As such, HASC professional students who engage in IPE learn *with* each other and *with* practitioners from diverse HASC professional backgrounds, *about* their different professions (e.g., profession-specific competencies, roles and responsibilities, etc.), and *from* each other through active participation and exchange of knowledge and skills. Thus, by stressing that the students learn *with*, *about,* and *from* each other, IPE embodies

constructivist and socio-constructivist principles (Dewey, 1916, 1938; Piaget, 1936, Vygotsky, 1978). These principles exemplify that learners' active engagement with their environment (the curriculum[2]) and with others (social experiences) is crucial in their acquisition of interprofessional knowledge, skills, and dispositions—leading to effective IPCP (Arenson et al., 2015; Cox & Naylor, 2013; Curran et al., 2010; Gunaldo et al., 2021; Reeves et al., 2015). For these reasons, the WHO and the Canadian federal government and associated organizations have progressively been promoting IPE and IPCP as effective approaches to improving HASC professional education and delivery systems (Figure 1).

[2] Fish and Coles (2005) postulate that the *curriculum* includes "all the activities, experiences and learning opportunities for which an institution or a teacher takes responsibility—either deliberately or by default."

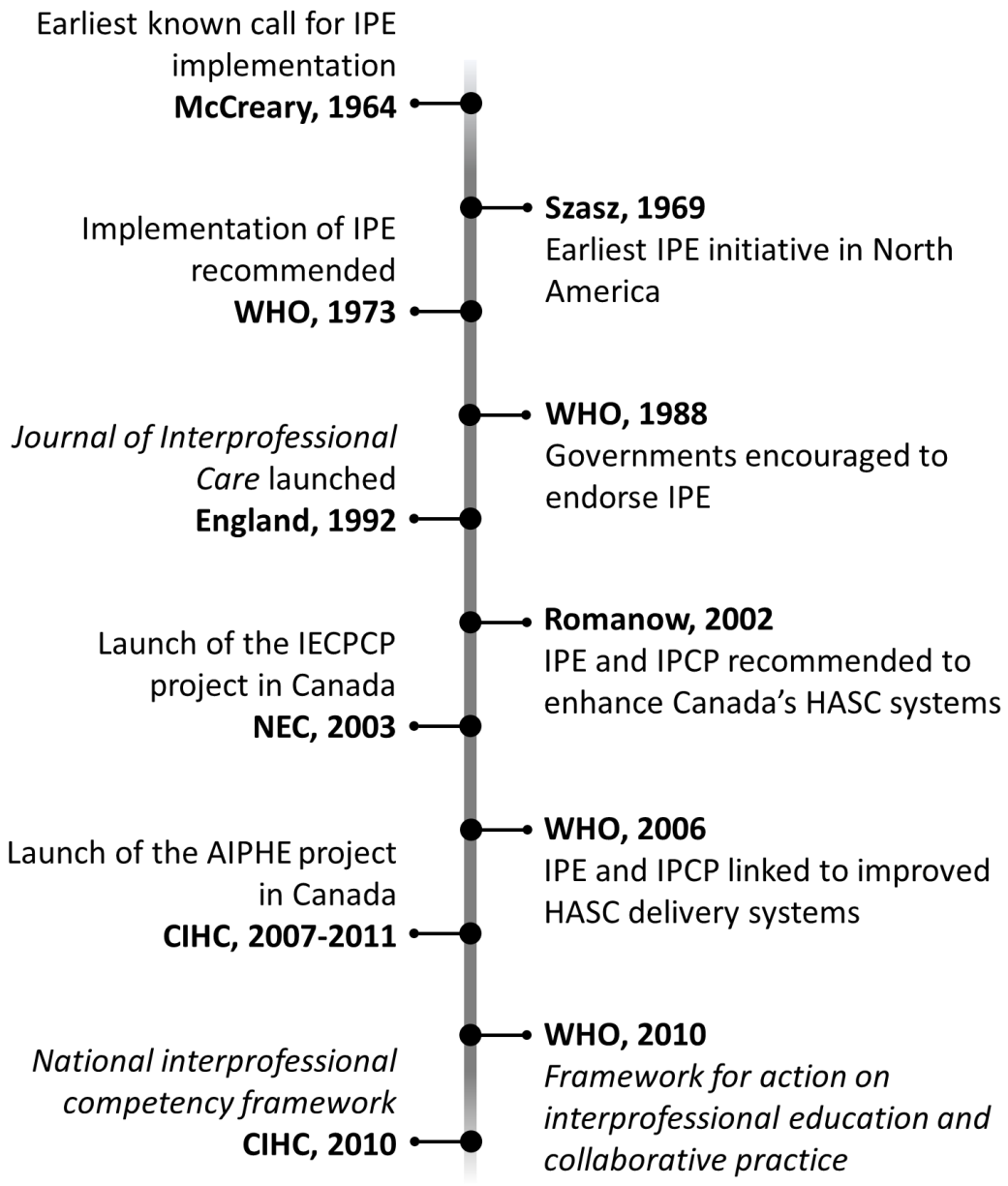

Figure 1 *A Timeline of the Most Prominent Advancements in Promoting IPE and IPCP as Effective Approaches to Improving HASC professional education and HASC Delivery Systems*. AIPHE, Accreditation for Interprofessional Health Education; CIHC, Canadian Interprofessional Health Collaborative; HASC, health and social care; IECPCP, Interprofessional Education for Collaborative Patient-Centred Practice; IPE, interprofessional education; IPCP, interprofessional collaborative practice; NEC, National Expert Committee; WHO, World Health Organization.

1.3.1 Endorsement by the World Health Organization

In 1973, the WHO Expert Committee on Continuing Education for Physicians revised the then-current situation of continuing medical degree programs worldwide and proposed recommendations on how pedagogical methods in medical education could be modernized. One of the educational activities which the committee had recommended was "The development of demonstration projects in interprofessional education" (WHO, 1973, p. 30).

During the International Conference on Primary Health Care in September 1978, the WHO (1978) recognized IPE and IPCP as critical elements of primary HASC. The WHO recommended that "governments give high priority to the … [development of] teams composed of community [HASC] workers, other development workers, intermediate personnel, nurses, midwives, physicians, and where applicable, traditional practitioners and traditional birth attendants" (p. 26).

In 1988, a WHO Study Group, which had met in October 1987, published its technical report citing its recommendations in promoting IPE. The report (WHO, 1988) recommended that post-secondary institutions should develop IPE activities. Further, the report recommended that provincial and national governments should endure commitment to the concepts of IPE and IPCP, as well as revise the organizational structures of their HASC delivery systems to comply with the provisions of employing IPCP approaches.

In April 2006, the WHO published a report entitled *The world health report 2006: Working together for health* (2006b), whereby the WHO outlined that the HASC workforces worldwide were not meeting the demands of the HASC labour markets, mainly due to increased urbanization and global population growth (Van Bavel, 2013), as well as intensified globalization and increased migration of HASC practitioners (Grignon et al., 2013). Further, the WHO proposed that strengthening the HASC workforce entails: (1) creating strong HASC

professional degree programs, where IPE is implemented; (2) assuring educational excellence through accreditation and regulation of high-quality standards; and (3) revitalizing recruitment resources, whereby social compatibility between competent HASC practitioners and their patients is achieved. In so doing, the WHO (2006b) assured that graduating HASC professional students would possess the "technical competencies [and] background, language and social attributes [that] make them accessible and able to reach diverse clients and populations" (p. xx). One month later in May 2006, during the 59th World Health Assembly in Geneva, Switzerland, the WHO addressed the global shrinking HASC workforce by adopting Resolution WHA59.23 (WHO, 2006a), which advocated for the use of "innovative approaches to teaching [such as IPE] in industrialized and developing countries" (p. 38).

In 2007, the WHO established the Study Group on Interprofessional Education and Collaborative Practice. This study group, which is comprised of leading experts in IPE from all over the world, conducted an international environmental scan (see Rodger & Hoffman, 2010) to identify where, how, and why IPE initiatives were being implemented at the time.

Three years later, the WHO (2010) issued its *Framework for action* on IPE and IPCP, whereby the WHO acknowledged that no two countries exhibit identical contexts within their local jurisdictions; thus, the WHO accentuates that IPE should be implemented using a flexible, population-based approach which meets the needs of each population, rather than in a *one size fits all* approach. Therefore, through this framework, the WHO provides to policymakers and curriculum developers with the "ideas on how to *contextualize* their existing [HASC] system, *commit* to implementing principles of interprofessional education and collaborative practice, and *champion* the benefits of interprofessional collaboration with their regional partners, educators and [HASC] workers" (p. 11, emphasis in original).

The *Framework for action* (WHO, 2010) identified several research-informed mechanisms that are required for the successful implementation of IPE. The WHO encouraged institutions to demonstrate commitment towards providing adequate funding, logistical and scheduling support, and faculty development and training (Hammick et al., 2007; Reeves, 2000; Stone, 2007). Indeed, faculty play pivotal roles in creating positive IPE-relevant experiences for their students. Lingard et al. (2002) exemplified this notion by illustrating that HASC professional students and recent graduates construct their professional identities by resonating their professional "community's prominent discourse patterns … as a way of advertising community membership: 'I walk and talk like you, therefore I am worthy of belonging [with you]'" (p. 733). Thus, the WHO stressed that faculty receive adequate training, whereby they would be able to develop appreciation, desire, and enthusiasm for facilitating IPE and collectively foster a common vision for its implementation (Freeth et al., 2008).

Furthermore, the WHO encouraged curriculum developers to utilize the problem-based learning strategies that are associated with adult learning theory (Knowles, 1968) and the principles associated with social constructivist theory (Vygotsky, 1978), and the creation of collaborative learning locales (Gilbert, 2005) during the development of IPE-incorporated curricula. Additionally, the WHO highlighted the need for identifying IPE-relevant competencies, incorporating IPE-relevant standards in accreditation mechanisms, and implementing IPE within the contexts of research-driven initiatives. This dissertation discusses many of these initiatives, especially in the Canadian context.

1.3.2 The Canadian Experience

In 2001, the Government of Canada entrusted Roy Romanow—the then-current Chair of the Royal Commission on the Future of Health Care in Canada—to propose recommendations aimed at enhancing Canada's HASC delivery systems. In 2002, Romanow

published his report, entitled *Building on values: The future of health care in Canada*, wherein he advised that "new approaches to education and training are needed in addition to a careful look at how the roles and responsibilities of various [HASC practitioners] are changing along with changing patterns of care" (p. 104). Furthermore, he considered that if IPCP were to be implemented, it should start when the HASC practitioners are still students, stating that "if [HASC practitioners] are expected to work together and share expertise in a team environment, it makes sense that their education and training should prepare them for this type of working arrangement" (p. 109).

Consequently, following the First Ministers' Accord on Health Care Renewal in 2003, Health Canada proclaimed that it would be devoting $21 million over the forthcoming six years to promote IPE and IPCP. These investments propagated the creation of the pan-Canadian Health Human Resources Strategy (HHRS), through which the National Expert Committee (NEC) devised and directed the Interprofessional Education for Collaborative Patient-Centred Practice (IECPCP) initiative (2004–2011). Through the IECPCP initiative, the NEC identified three main objectives (Herbert, 2005): (1) to "promote and demonstrate the benefits of interprofessional education for collaborative [patient/client-centred] practice;" (2) to "increase the number of [HASC practitioners] trained for patient-centred interprofessional team practice;" and (3) to "stimulate networking and sharing of best educative practices for collaborative [patient/client-centred] practice" (p. 2).

Further, the IECPCP initiative led to the establishment of the Canadian Interprofessional Health Collaborative (CIHC) in 2006, which among its many deliverables included the now globally recognized *National Interprofessional Competency Framework* (2010; see section 1.4). The IECPCP initiative further funded the two-phase Accreditation of Interprofessional Health Education (AIPHE) project (2010, 2011; see Section 1.5).

1.4 The Canadian National Interprofessional Competency Framework

A clear understanding of the knowledge, skills, and dispositions of a collaborative HASC practitioner, as described in a multitude of competencies, is necessary to inform IPE curriculum development (Gilbert, 2014). In its 2010 *Framework for action*, the WHO recommended that IPE-relevant competencies be identified. Concurrently, the CIHC (2010) developed *A National Interprofessional Competency Framework*. The framework is comprised of two, overarching *competency*[3] domains that are supported by four other domains: (1) Interprofessional Communication; (2) Patient/Client-Centred Care; (3) Role Clarification; (4) Team Functioning; (5) Interprofessional Conflict Resolution; and (6) Collaborative Leadership.

1.4.1 Interprofessional Communication

Students who engage in IPE initiatives should develop interprofessional communication skills, such as attentive listening, trust, mutual respect, and transparency. Ultimately, communicating clearly and sufficiently enables HASC practitioners to clarify their roles and responsibilities, function appropriately within the interprofessional team, and resolve any conflicts with the team (CIHC, 2010).

1.4.2 Patient/Client-Centred Care

In patient/client-centred care, the patient is deemed a valuable member of the interprofessional team, where they engage in the diagnosis, treatment, and management of their own disease. This approach to HASC provision centralizes the patient as the subject of attention (Gilbert, 2008a), whereby their voice is heard, and their preferences and needs are

[3] According to Frank et al. (2010), a *competency* is "an observable ability of a [HASC] professional, integrating multiple components such as knowledge, skills, values, and attitudes" (p. 641). Gruppen et al. (2012) posit that a competency involves measuring HASC professional students' performance at meeting minimal proficiency in several domains, including communication, clinical skills, ethics, problem-solving, and professionalism.

recognized, especially within the context of their home and work environments. Hence, HASC practitioners are required to provide the patient with the knowledge, skills, and resources that enable the patient to retain control over the design and implementation of the HASC services they receive. In this manner, the "patients are seen as experts in their own lived experiences" (CIHC, 2010, p. 13).

1.4.3 Role Clarification

HASC professional students develop their uniprofessional identities through their profession-specific activities. Furthermore, they also develop an interprofessional identity through IPE. Thus, these two identities may lead to role confusion among HASC professional students (DeMatteo & Reeves, 2013). Hence, clarifying each profession's roles and responsibilities through interprofessional socialization is crucial for the students to become effective collaborators (Khalili et al., 2013). By learning *with*, *from*, and *about* one another, the students understand that each HASC profession contributes its own, profession-specific set of knowledge and skills required for successful patient/client-oriented IPCP. Ultimately, the knowledge gained through IPE allows the HASC professional students to reduce the hierarchical, stereotypical, and mistrustful attitudes that are commonly exhibited in the HASC professions, thus enabling them to develop a dual professional and interprofessional identity (Khalili et al., 2013).

1.4.4 Team Functioning

An interprofessional team, comprised of several HASC practitioners and the patient, relies on the aforementioned interprofessional communication skills to function properly. When functioning as a cohesive unit, interprofessional collaborators are able to coordinate the diagnosis, treatment, and management of disease in an effective manner, whereby they

can eliminate redundant medical services, prevent delays, decrease medical errors, and reduce HASC costs.

1.4.5 Interprofessional Conflict Resolution

Like in any other system, power dynamics and hierarchical structures exist in HASC delivery systems. Therefore, HASC practitioners must know how to resolve any conflicts and disagreements that may arise among them, thereby transforming such affairs into constructive interactions. These conflicts usually arise due to differing philosophies and approaches towards the diagnosis, treatment, and management of disease, ambiguity of roles and responsibilities, and/or diverging, personal cultural values. Nonetheless, members of an interprofessional team must be committed to addressing disagreements and resolving conflicts with the aim to provide optimal, patient/client-centred care.

1.4.6 Collaborative Leadership

IPCP involves acknowledging that all members of the interprofessional team assume leadership roles, depending on the situation. For instance, when the interprofessional team discusses the discharge plan for the patient, the physician assumes leadership; when the team discusses the management of the patient's disease within the context of the patient's work environment, the occupational therapist assumes leadership; and so on. Other examples of leadership roles involve ensuring that the team remains on task, mentoring team members as required, and forming close, professional relationships with the patient.

Proficiency in these interprofessional competencies and their associated elements is essential for implementing IPCP successfully. Hence, it is critical that IPE-relevant accreditation standards be identified, whereby HASC professional degree programs are held responsible for cultivating these competencies in their students.

1.5 The Canadian 'Accreditation of Interprofessional Health Education' (AIPHE) Project

With support from both Accreditation Canada and the Association of Faculties of Medicine of Canada (AFMC) and through the AIPHE project, Canada became the first country in the world to use a collaborative approach to developing and embedding IPE language spanning five accreditation[4] standards domains into the accreditation standards of six HASC professions: medicine, nursing, occupational therapy, pharmacy, physiotherapy, and social work (Table 1). These domains were intended to ensure commitment towards the implementation of IPE. Generally, the IPE-relevant accreditation standards require institutions to dedicate resources as well as commitment to innovative and collaborative learning in support of IPE. Further, individual education programs are required to explicitly outline IPE-relevant learning objectives as well as assess IPE-relevant competencies for all their students. Lastly, faculty are required to share common IPE-relevant values that are reflected in both their teaching and clinical practice.

[4] The WHO (2011) defines *accreditation* as the "formal process by which a recognized body … assesses and recognizes that a [HASC] organization meets applicable pre-determined and published standards. Accreditation standards are usually regarded as optimal and achievable and are designed to encourage continuous improvement efforts within accredited organizations" (p. 1). Therefore, accreditation is the primary method by which HASC professional degree programs enhance and maintain the quality, values, and activities of education (Eaton, 2003).

Table 1 *The Accreditation Standards Domains Identified in the AIPHE Project (2010, 2011)*

Domain	Description
Organizational Commitment	*Organizational Commitment* refers to the administrative structures and processes, preferably at the level of the Vice President's Office and/or deanship, must foster the development, implementation, and evaluation of interprofessional education.
Faculty	Faculty members must be supported, encouraged, and prepared to facilitate the development, implementation, and evaluation of interprofessional education.
Students	Students must understand the significance of interprofessional education and demonstrate proficiency in interprofessional competencies.
Educational Program	Educational programs within and across faculties must share a common understanding of IPE and facilitate the development, implementation, and evaluation of interprofessional education throughout the learning continuum for all students.
Resources	The human, material, and financial resources that enable the development, implementation, and evaluation of interprofessional education must be supplied.

Note. AIPHE, Accreditation for Interprofessional Health Education.

The incorporation of IPE-relevant accreditation standards in the accreditation mechanisms of the HASC professional degree programs ultimately leads to enhanced HASC

outcomes (Gilbert, 2008b). Further, the WHO's (2017) National Health Workforce Accounts (NHWA) system, specifically Indicator 3-06, is a significant global driver of IPE accreditation. Through enabling IPCP, IPE accreditation is a small, albeit significant, step towards achieving several education and HASC-related Sustainable Development Goals (United Nations, 2015) aimed at ensuring inclusive learning opportunities and promoting well-being for all (WHO, 2020). IPCP also addresses two of the WHO's triple billion targets (2018): "1 billion more people better protected from health emergencies" and "1 billion more people enjoying better health and well-being" (p. 1).

1.6 Rationale for and Description of Present Research

In this Introduction thus far, we described initiatives that support the implementation of IPE in both global and Canadian contexts. Indeed, achieving the intended patient/client-oriented outcomes of IPE and subsequent IPCP is complex. Deliberate and purposeful considerations of several systemic (macro-level), institutional (meso-level), and teaching (micro-level) factors (D'Amour and Oandasan, 2005) must be addressed to ensure that IPE is delivered *sustainably* (Grymonpre et al., 2016a, 2016b; see Figure 2). Macro-level factors include (1) the adoption of common interprofessional language across the diverse HASC professions and (2) institutional commitment towards adequate resources for collaborative care. Meso-level factors include (3) fulfillment of interprofessional-relevant accreditation standards by respective HASC professional degree programs and (4) scholarship that informs decision-making and continuous quality improvement of collaborative care. Lastly, micro-level factors include (5) the design, implementation, and continual evaluation of a theoretically informed and scaffolded IPE curriculum.

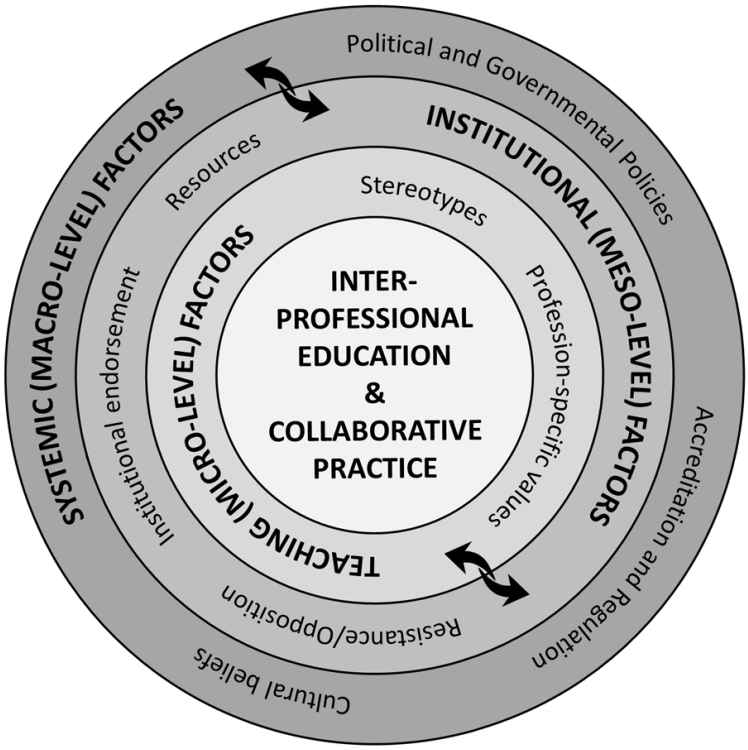

Figure 2 *A Visual Representation of the Factors That Influence Delivery of interprofessional Education.* Adapted from D'Amour & Oandasan's framework (2005).

Regrettably, the analyses of the extent to which these factors have collectively influenced effective IPCP leading to patient/client-oriented outcomes is currently under-researched. As such, we embarked on this research project to study and understand the IPE milieu within HASC professional degree programs in Canada. For this integrated-article dissertation, we first conducted a systematic review (Chapter 2; Azzam et al., 2022b) to familiarize ourselves with and explore *when* and *where* IPE has been implemented over the past decade (2010–2020). This study revealed that Canadian post-secondary institutions continue to be global pioneers in designing and implementing IPE curricula.

To further understand the influences of the systemic (macro-level) factors (e.g., IECPCP initiative and AIPHE project) on such implementation and to explore *how* these curricula are enacted, we conducted a comparative document analysis (Chapter 3; Azzam et

al., 2021), through which we evaluated the *accountability* of interprofessional-relevant accreditation standards embedded in Canadian HASC professional accreditation standards documents—to which accrediting organizations can hold their respective academic programs *accountable*.

These two research studies (systematic review and document analysis) revealed three major research gaps: (1) that most IPE initiatives lacked the use of theoretical and conceptual frameworks[5]; (2) that the IPE-relevant accreditation standards overwhelming emphasis on the *Students* and *Educational Program* domains alone potentially compromises the sustainability of IPE; and (3) that longer IPE initiatives with greater intensity and more rigorous methodological and assessments methods are warranted. To address the first research gap, we present a conceptual paper (Chapter 4; Azzam & Puvirajah, In Press) in which we discussed the importance of curriculum theory and learning to HASC professional education processes and proposed a theoretical framework for productive engaged learning in the professions through which IPE opportunities may be grounded.

To address the second and third research gaps, we explored the integration of IPE curriculum models (meso- and micro-level) in the programmatic structures at four, large Canadian post-secondary institutions (Chapter 5; Azzam et al., In Press). We further explored the enablers, barriers/challenges, limitations, and outcomes of these curriculum models, as perceived by classroom-based facilitators and practice-based preceptors of the IPE activities

[5] A *theoretical framework* can be defined as a "logically developed and connected set of concepts and premises—developed from one or more theories—that a researcher creates to scaffold a study" (Varpio et al., 2020, p. 990). Similarly, a *conceptual framework* can be defined as "the justification for why a given study should be conducted. The conceptual framework (1) describes the state of known knowledge, usually through a literature review; (2) identifies gaps in our understanding of a phenomenon or problem; and (3) outlines the methodological underpinnings of the research project" (p. 990).

and whether they truly lead to effective IPCP (Chapter 6). This study was approved by the by the Western University Non-Medical Research Ethics Board (#120360).

Addressing the research gaps described herein has been prioritized by the Global Confederation for Interprofessional Education and Collaborative Practice (IP.G); “Developing evidence of [IPE’s] impact along the continuum from interprofessional education to collaborative practice in person- and community-centred service delivery” (Khalili et al., 2019, p. 15). In Chapter 7, we summarize the findings of these research studies and describe any future directions. We postulate that our findings will complement the promotion of IPE and IPCP by the WHO and the federal and provincial governments with aim to improve patient/client-centred care, motivate curriculum developers worldwide to integrate IPE in their programmatic structures, and inform potential revisions and updates of IPE-relevant standards by HASC professional accrediting organizations in Canada.

Chapter 2

2 Interprofessional Education in Prelicensure Health and Social Care Professional Education: A Systematic Review

2.1 Abstract

There is growing evidence supporting the importance of interprofessional education (IPE) and interprofessional collaborative practice (IPCP) in improving patient/client-centred care and outcomes. The purpose of this review was to examine how recent studies (2010–2020) designed, implemented, and evaluated IPE initiatives and determine whether these initiatives were effective in preparing health and social care (HASC) professional students for IPCP. This review was guided by the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) checklist to filter the studies and extract and analyze the data. Eligible peer-reviewed studies required inclusion of two or more HASC professions in a prelicensure IPE context and description of student-centred learning outcomes. Thirty-seven studies were included in this review. Recent studies (2010–2020) are increasingly developing practice-based simulations, incorporating IPE into mandatory coursework, and employing qualitative and mixed methods to assess student experiences. Nonetheless, most interventions lacked the use of theoretical and conceptual frameworks, were generally non-representative of HASC professions other than medicine and nursing, and were short in duration. It is not known whether the positive impacts associated with IPE experiences in the short-term studies would remain with the students into their professional lives. Longer interventions with greater intensity and more rigorous methodological and assessment methods are warranted. Future studies should employ larger, more inclusive sample sizes from a wider range of HASC professions; survey IPE program coordinators and facilitators; include patients in IPE

development; and assess and report how their institutions are committed to fostering IPE and meeting IPE-relevant accreditation standards.

2.2 Background

Increasing evidence suggests that interprofessional collaborative practice (IPCP) has potential to lead to improved patient/client-oriented outcomes (Grymonpre et al., 2010, 2016a, 2016b; Khalili et al., 2019; Murphy et al., 2019). One approach that has potential to lead to effective IPCP is through the sustainable delivery of interprofessional education (IPE; Grymonpre et al., 2016a). According to D'Amour and Oandasan (2005), IPE is complex and therefore must be delivered through deliberate and purposeful considerations of several teaching, institutional, and systemic factors (see Figure 2).

It can be argued that systemic factors provide the impetus for enacting institutional factors, and in turn, institutional factors support the enactment of teaching factors. For example, institutional and teaching factors can be more easily addressed when the delivery of IPE is encouraged by regulatory bodies and mandated through accreditation standards. In turn, commitment by administrative structures and processes towards the development, implementation, and evaluation of IPE initiatives across several faculties and/or academic units that house the health and social care (HASC) professions results in the subsequent allocation of sufficient personnel, material, and financial resources for IPE. Such administrative undertakings ultimately include focusing not only on student-centredness, but also on various outcomes oriented at the facilitators and stakeholders of IPE initiatives, the patients, and the education programs themselves (Azzam et al., 2021; Grymonpre et al., 2021).

While the research literature on these outcomes is relatively plentiful and dates back to the emergence of IPE in the 1960s, only recently and especially over the past decade, have

IPE implementation and IPE research output accelerated in response to increasing emphasis on IPCP models by HASC delivery systems and other related stakeholders (Steketee & O'Keefe, 2020). It has been almost a decade, however, since a comprehensive review and synthesis of research literature on prelicensure IPE initiatives has been conducted. Such periodic review is important to identify, appraise, and synthesize various IPE research initiatives focusing on the preparation of HASC professional students for IPCP. This systematic review provides a summary of the latest research on IPE, especially the enablers and barriers for sustainable delivery of IPE, thus contributing to evidence-based IPE practices and eventually leading to improved patient/client-oriented outcomes.

2.2.1 The Present Study

The purpose of this systematic review was to examine how recent studies (2010–2020) designed, implemented, and evaluated IPE initiatives and determine whether these initiatives were effective in preparing HASC professional students for IPCP. Using the parameters delineated in the *Population, Intervention, Comparison, Outcomes, and Study Design (PICOS) framework* (Liberati et al., 2009), we developed the following research question, *What are the major trends and findings of IPE implementation studies conducted over the last decade (2010–2020)?*

Guided by this research question, our review scrutinized studies in a broad range of IPE factors including, but not limited to, curricular content and structure, student-centred interprofessional learning outcomes and competencies, recruitment strategies of participants, outcomes and assessment methods, strategies for faculty development, and organizational commitment and support. Examining these factors has potential to report innovative educational approaches and research methodologies, reveal prevailing challenges, inform best practices, and generate recommendations for future IPE studies. In so doing, we

believe that this review considerably contributes to the growing IPE literature and informs the global efforts of supporting the design, implementation, and evaluation of sustainable IPE initiatives.

2.3 Methods

This review was guided by the Cochrane Handbook for Systematic Reviews of Interventions (Higgins et al., 2019) and the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) checklist (Moher et al., 2015) and its accompanying document PRISMA-P 2015 Explanation and Elaboration (Shamseer et al., 2015) to demonstrate legitimacy, independence, and impartiality (Gupta et al, 2018). Further, the protocol for this review has been registered with the International Prospective Register of Systematic Reviews (PROSPERO; registration # CRD42021232141).

2.3.1 Establishing Inclusion and Exclusion Criteria

Studies that were not peer-reviewed, were written in a language other than English, and/or were published before 2010 were excluded from this review. Further, studies meeting the following criteria were included: (1) the study must involve HASC professions in a HASC professional education setting; (2) the study must focus on prelicensure HASC professional education, which can occur at either undergraduate or graduate level; and (3) the study must involve an intervention within an IPE context. The intervention can utilize any accepted methodological approach within the quantitative, qualitative, and mixed methods traditions. Further, in keeping with the CAIPE (2016) definition of IPE, it is necessary for the learning outcomes reported from the intervention to involve students from at least two HASC professions where they learned “about, from and with each other” (p. 1).

2.3.2 Conducting the Search

With guidance from two academic librarians at our institution, four electronic databases were identified as appropriate for conducting our review as their literature coverage included both areas of health and health education. These databases are: (1) Cumulative Index to Nursing and Allied Health Literature (CINAHL); (2) the Education Resources Information Center (ERIC); (3) Scopus; and (4) PubMed. We developed and applied our comprehensive search strategy using the inclusion criteria. Figure 3 illustrates our search strategy used in PubMed, as an example.

1	(interprofessional OR inter-professional)
2	(interdisciplinary OR inter-disciplinary)
3	1 OR 2
4	(pre-licensure OR prelicensure OR pre licensure)
5	(pre-licensed OR prelicensed OR pre licensed)
6	4 OR 5
7	(education)
8	(collaboration)
9	(communication)
10	(collaborative practice)
11	(practice)
12	(teamwork)
13	7 OR 8 OR 9 OR 10 OR 11 OR 12
14	3 AND 6 AND 13
15	(2010:2020[pdat])

Figure 3 *The Comprehensive Search Strategy for PubMed*

2.3.3 Filtering the Studies

Search results of articles were uploaded to Covidence (Veritas Health Innovation Ltd, 2021). Once duplicates were removed, two authors (MA and JR) used the exclusion and inclusion criteria to independently screen the articles according to the modified PRISMA flowchart (Moher et al., 2009) illustrated in Figure 4. During each round, screening results were compared between screeners, and any discrepancies and ambiguities were resolved through discussion.

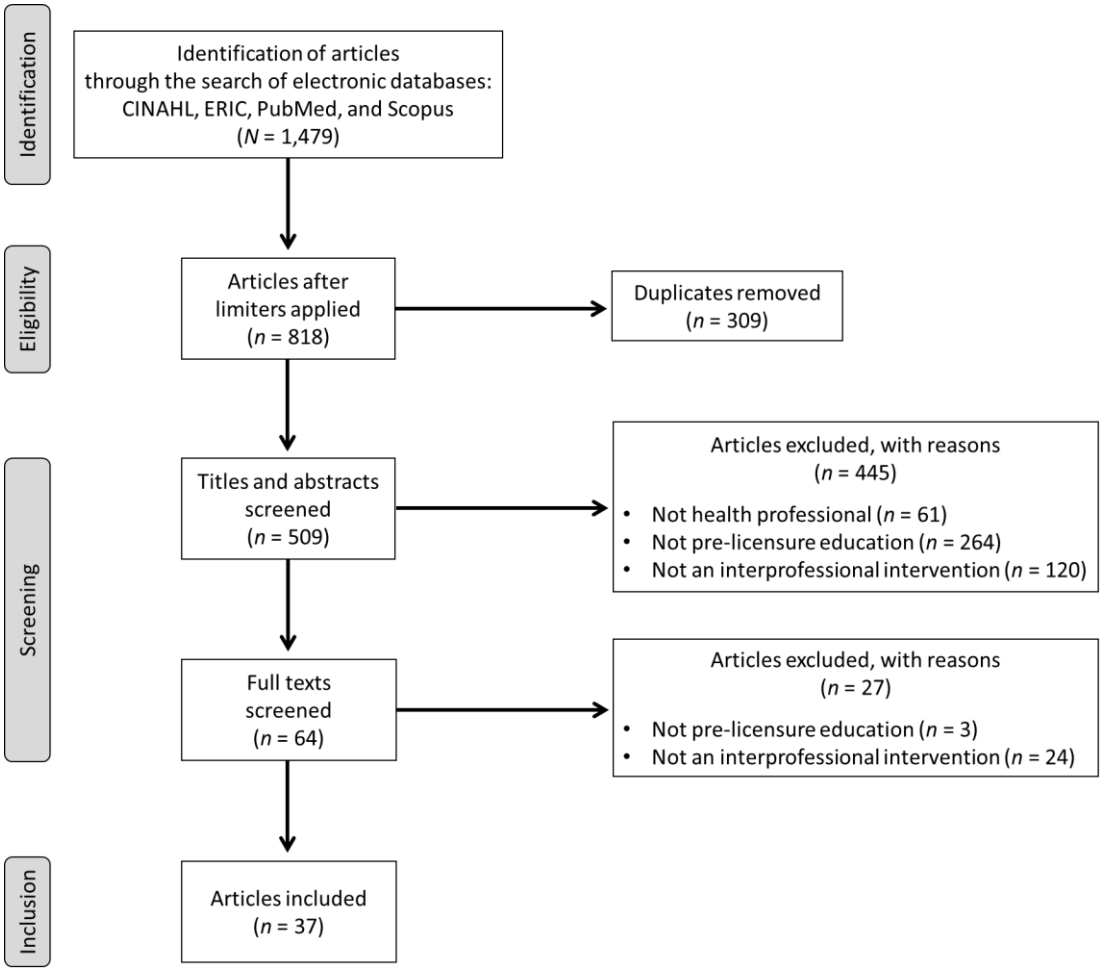

Figure 4 *A PRISMA flowchart illustrating the filtration of studies.* Adapted from Moher et al. (2009). CINAHL: Cumulative Index to Nursing and Allied Health Literature; ERIC: Education Resources Information Center.

2.3.4 Extracting the Data

We created a data extraction protocol, which we subsequently used, for the extraction of relevant elements, attributes, and procedures from the included studies. The data extraction protocol included a list of 44 items, which were categorized into five domains: (1) Details of Publication; (2) Study Profile; (3) Characteristics of Intervention; (4) Students/Participants; and (5) Educators/Facilitators (see Appendix 1). Any variations in data extraction were resolved through discussion. Study authors were contacted via email to collect any unspecified data and/or clarify any discrepancies using open-ended questions.

2.3.5 Analysis and Synthesis

Since the extracted studies were heterogeneous and diverse in methodology with respect to interventions, research approach, instrumentation, data collection and analysis, and outcomes, conducting a meta-analysis was not possible. Thus, we presented the results in narrative format (Ryan, 2013; Popay et al., 2006). Further stemming from our analysis, we illustrated the relationships within and between studies as well as their outcomes and the factors affecting those outcomes.

2.4 Results

2.4.1 Profiles of Included Studies

A total of 37 studies were analyzed in this systematic review (see Appendix 2). The majority of these studies were conducted in the United States (*n* = 20; 54%), followed by Canada (*n* = 13; 35%). Most of the studies were conducted across several HASC professional programs/faculties at a single institution (*n* = 31; 84%), whereas only six studies (16%), involving several HASC professions, were based on multi-institutional collaborations among up to seven institutions.

Further, more than half of the studies employed mixed methods approaches (*n* = 19; 51%) to report their findings, followed by quantitative methods (*n* = 13; 35%), which largely involved the use of well-established surveys with verified validity and reliability measures. Only three of these quantitative studies involved randomization of students to intervention and control groups, whereas others employed quasi-experimental designs with pre-intervention and/or post-intervention assessment tools. Only five of the studies (14%) employed qualitative approaches, which involved examining interview and/or focus group data using thematic analyses. Lastly, the majority of studies (*n* = 29; 78%) utilized non-probability, convenience sampling techniques to recruit participants, while only two (5%) mixed methods studies employed purposive sampling.

The majority of studies (*n* = 23; 62%) neither employed theoretical nor conceptual frameworks to lay foundation to or guide the research. Alternatively, 10 studies were supported by theories from social psychology and/or education, while six studies used conceptual frameworks (see Appendix 3). These 16 studies further described how these frameworks guided the development and implementation of their IPE interventions.

2.4.2 Description of Participants and Facilitators

A total of 6,904 students (μ = 187) participated across all IPE interventions, with significant variability in sample sizes among studies (range: 6–1,000; Figure 5). While some studies (*n* = 3; 8%) included students from up to 10 professions, approximately one-third of the studies (*n* = 12; 32%) included students from only two HASC professions—notably, medicine and nursing. Nursing represented the most common HASC profession included across all studies (*n* = 31; 84%), followed by medicine (*n* = 26; 70%), physiotherapy (*n* = 18; 49%), and pharmacy (*n* = 16; 43%). Almost half of all participants were identified as medical

students (*n* = 1,726; 25%) or nursing students (*n* = 1,312; 19%), while the professions of approximately 25% of all participants from eight different studies were not reported.

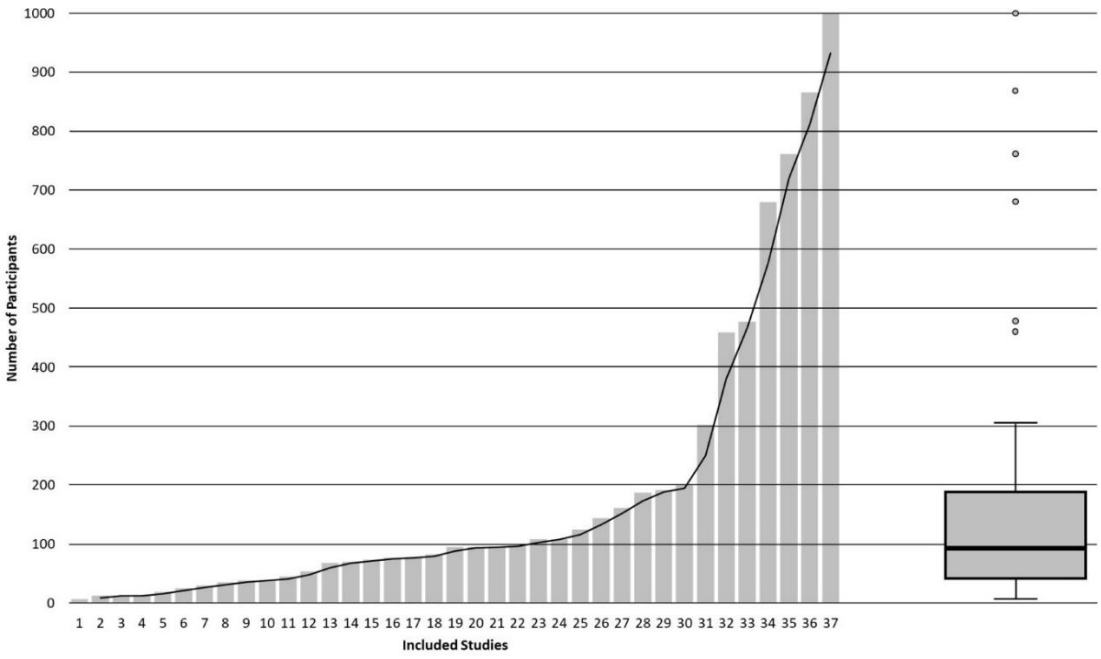

Figure 5 *Number of participants (N = 6,904; μ = 187; range: 6–1,000) in each of the reviewed interventions (n = 37*). The box and whiskers plot illustrates the median: 94; inter-quartile range: 151.

Twelve of the included studies (32%) incorporated their IPE interventions in the students' core coursework or practice-based placements; therefore, participation was mandatory and course credits were awarded. Other studies (*n* = 18; 49%) implemented their interventions either as elective courses, where course credits and/or certificates of participation (*n* = 4), gift cards (*n* = 2), or candy bars (*n* = 1) were awarded; six studies provided no incentives; and five studies did not report any incentives. Further, three studies (8%) involved mandatory participation from students of some professions but only voluntary participation from students of other professions, where either course credits (*n* = 2) or honoraria (*n* = 1) were rewarded. Four more studies neither reported the type of participation

(mandatory vs voluntary) nor the incentives to participants. None of the studies reported incentives to facilitators.

Further, 12 studies reported that the faculty involved in developing and facilitating the IPE interventions were from the same HASC professions that the student participants represented. Other information regarding participants and facilitators (e.g., age, gender, academic level, qualifications, and experience with IPE, etc.) was either inconsistently reported or unreported in the studies.

2.4.3 Characteristics of Interventions

More than one-third of the interventions (*n* = 14; 38%) were implemented as one-time workshops, lasting between two and 12 hours. Two interventions were implemented longitudinally over one or two years. Further, the majority of these interventions (*n* = 28; 76%) were mainly developed by faculty/researchers, whereas two studies reported contributions by students and/or alumni. None of the studies reported contributions by patients and/or their families.

Further, most studies (*n* = 23; 62%) utilized simulation-based approaches, four of which were implemented at practice-based placement sites, whereby interprofessional teams interacted with patients. Other studies (*n* = 13; 35%) utilized case-specific, problem-based learning strategies involving group discussions and reflections. Two of these studies incorporated online components, such as virtual discussions and e-learning modules. Lastly, all studies reported utilizing small-group learning; those that reported the sizes of these groups indicated two (*n* = 1), three to seven (*n* = 4), and eight to 12 (*n* = 5) participants per group.

In addition, most of the interventions focused on practice-based subject areas, with disease management (*n* = 10) being the most focused on subject area, followed by geriatric

care (*n* = 8), and pain management (*n* = 4). Some studies also implemented interventions that focused on anatomical gross dissection (*n* = 3) and/or classroom-based discussions regarding IPE competencies (*n* = 4; Figure 6).

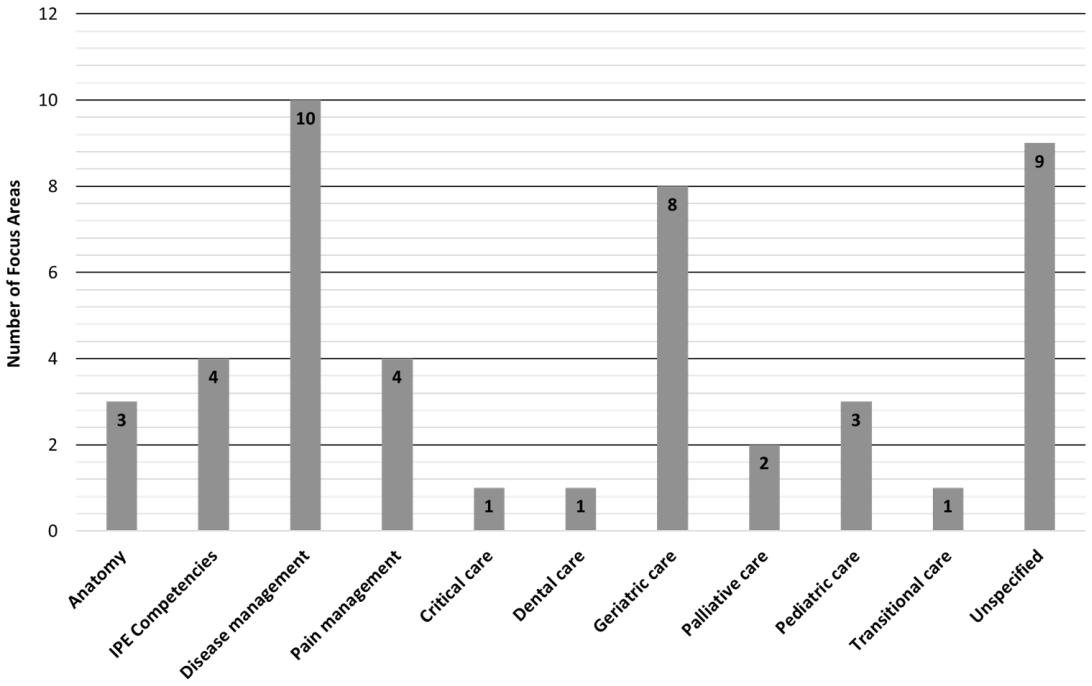

Figure 6 *Subject areas of the interprofessional education initiatives in included studies (n = 37)*

2.4.4 Outcomes and Assessment Methods

Among outcomes and assessment tools, student self-reporting surveys were most commonly used (*n* = 41), followed by semi-structured interviews and focus groups (*n* = 9), open-ended questions (*n* = 8), and observations (*n* = 3). Other assessment methods included the use of audio-recordings of group discussions; knowledge tests; and agent-based modeling (ABM) to create sociograms—visual representations of intragroup networking (see Appendix 4).

The response rates to the surveys varied between 23% and 100%, with 13 of the studies not reporting response rates. The majority of surveys administered were well-known

in the field with established validity and reliability, with the most commonly employed survey being the Revised Readiness for Interprofessional Learning Scale (RIPLS, McFadyen et al., 2006; *n* = 6), followed by the University of West of England Interprofessional Questionnaire (UWE-IPQ, Pollard et al., 2004; *n* = 4) and the revised Interdisciplinary Education Perception Scale (IEPS; McFadyen et al., 2007; *n* = 4). Further, nine studies employed unspecified, in-house surveys, which reported one or more of the following: student attitudes towards IPE, actual need for cooperation, knowledge gains, and effectiveness of the workshop. Five of these studies did not report validity and/or reliability.

2.4.5 Student-centred Outcomes

All studies reported student-centred interprofessional learning outcomes and competencies, with observed statistically significant increases for all quantitative survey subscales, which were substantiated with analyses of the qualitative data. We found three broad themes related to student-centred outcomes: (1) Positive Attitudes Towards Interprofessional Learning; (2) Formation of Interprofessional Identities; and (3) Positive Impacts of Facilitators.

2.4.5.1 Positive Attitudes Towards Interprofessional Learning

In pre-intervention and retrospective post-intervention surveys, students largely noted how the *perceived need for interprofessional collaboration* had been hindered by mono-professional education, which mainly contributed to their lack of awareness of other HASC professions and the professions' interconnectivity in the health delivery system. Following participation, the students generally reported having more positive perspectives towards interprofessional learning. Nonetheless, the students stated that they would prefer a more versatile curriculum that encompasses a multitude of teaching and learning methods, including both lecture-based profession-specific learning and group-based interprofessional

learning. Additionally, it was noted that experiential learning in IPE directly enriched student learning by enabling them to gain content knowledge in relevant disciplines such as anatomy and physiology as well as enhance their skills and confidence with identifying and understanding key practice-based elements associated with disease assessment, patient management, and administration of medication.

2.4.5.2 Formation of Interprofessional Identities

Both facilitators and students indicated that the interprofessional learning sessions helped the students form their interprofessional identities. Most of these students were upper-year students, who had already formulated their own professional identities and therefore possessed greater ability to focus on their interprofessional interactions. Nonetheless, first-year students indicated that participation enabled them to increase the understanding of their and others' professional identities and clarify the *roles and responsibilities* expected of each HASC profession. Further, some students appreciated that their IPE experiences lasted for weeks (as opposed to shorter experiences), thereby enabling them to have more meaningful and in-depth professional interactions with those from other HASC professions and opportunities to interrogate, reflect, and reframe stereotypical, misconceived, and outdated views of other professions and foster more meaningful relationships and long-lasting friendships with their peers from other professions.

2.4.5.3 Positive Impacts of Facilitators

Most studies (*n* = 32) neither reported providing administrative support nor faculty development. Those that did report such resources stated that one-time training was provided to faculty, without any explicit strategies or examples. Nonetheless, students appreciated when their sessions were facilitated by adequately trained faculty facilitators—identified as influential role models who provided extensive feedback and

guidance, successfully demonstrated interprofessional collaborative skills, and reinforced positive attitudes towards IPE and IPCP.

2.4.6 Challenges

The examined studies reported several challenges to sustainable delivery of IPE. We classified these challenges into two themes: (1) Logistical Difficulties; and (2) Differences in Students' Level of Learning.

2.4.6.1 Logistical Difficulties

Scheduling was identified as one of the most frequently reported challenges to IPE implementation. The HASC professions are usually housed in different departments and/or faculties. Thus, lack of alignment in class schedules and practice-based rotations across professions hindered interdepartmental collaboration and created logistical barriers when attempting to find time that worked well for all participating professions. Further, due to the variations in programmatic requirements of the disparate HASC professional education programs, recruitment of student participants was reported as a challenge.

2.4.6.2 Differences in Students' Level of Learning

Students in some professions, such as nursing and psychology, usually participated in their senior year and therefore had already formed their professional identities and had more practice-based experiences, compared to students in professions such as medicine, occupational therapy, and physiotherapy. Further, junior students were generally frustrated by some IPE activities that occurred too early in their training, when authentic collaboration was limited.

2.5 Discussion

The major trends and findings in IPE research conducted over the last decade (2010–2020) were explored through this systematic review of 37 eligible studies. Our findings illustrated inconclusive evidence that the reviewed initiatives unquestionably lead to effective IPCP. The lack of ample evidence of IPE long-term positive outcomes, however, does not necessarily equate to evidence of IPE's futility. It was encouraging to observe that IPE studies in the last decade have increasingly employed qualitative and mixed methods approaches, as these diverse methodologies allow researchers to report a greater range of findings (Olson & Bialocerkowski, 2014; Reeves et al., 2013). It was also reassuring to observe that some IPE interventions implemented practice-based IPE—a practice deemed exemplary and innovative (Azzam et al., 2021). Further, students who participated in these IPE initiatives enhanced their understanding and proficiency in interprofessional knowledge, skills, and competencies, developed more positive attitudes and increased appreciation towards IPE and IPCP, and augmented their professional and interprofessional identities.

Nonetheless, most studies utilized self-reporting surveys, some of which were non-validated, to report these findings. Thus, the observed positive changes in students' knowledge, skills, and attitudes towards interprofessional learning and practice may have been influenced by self-reporting bias and confounding variables (Pollard et al., 2005) including age, gender, and personality traits—data that was neither collected nor evaluated. Hence, it would be difficult to verify whether the observed positive changes in students' knowledge, skills, and attitudes towards interprofessional learning and practice can be directly attributed to the curriculum (Reeves et al., 2015). More importantly, these self-reporting surveys are typically centred on *perceived* attitudes, where IPE's impact on the students' skills, behaviors, and dispositions are not assessed. Lastly, compared to longer and more sustained IPE interventions, evaluating the behavioural changes resulting from events lasting between

a few hours to several weeks—which was the case for most of these interventions—raises concerns that the claimed effectiveness of these initiatives may be only temporary and thus cannot substantiate the sought-after, long-lasting influence of IPE on HASC professional students in preparing them for sustainable IPCP (Hammick et al., 2007; Lawn, 2016). Hence, it is in the best interest of the field for researchers to implement longitudinal IPE initiatives and more rigorous methodological and assessment methods (e.g., observational studies), through which they could more objectively evaluate IPE's long-term effects on student preparedness for IPCP throughout their education and as they transition into licensed HASC practitioners during the first few years of their careers (Lawn, 2016). That being said, concurrently administering validated self-reporting surveys may be valuable in collecting attitudinal data; researchers should, however, try to minimize respondent bias by having proper research design including a sufficiently large sample size.

Further, most studies in this review were neither theoretically nor conceptually guided—a finding that has regrettably been consistent over the past two decades (Abu-Rish et al., 2012; Lapkin et al., 2013; Zhang et al., 2011), indicating an overall absence of relationships between theory and its application to practice. The use of theoretical and/or conceptual frameworks in HASC professional education programs, curricula, and syllabi is imperative for the effective development of IPE initiatives, helping identify the scope and objectives of the initiative and facilitating the evaluation of student-centred learning outcomes and competencies (Clark, 2006; Lawn, 2016). Those studies that were either theoretically and/or conceptually guided had appropriately utilized and thoroughly described social psychology and educational/learning theoretical and conceptual frameworks. These frameworks had been developed using a social constructivist lens, through which students interact and learn "with, from and about each other" (CAIPE, 2016, p. 1), make meaning of such experiences (Creswell & Poth, 2018), and form their own interprofessional attitudes,

skills, and dispositions. Future studies are recommended to employ and test new frameworks and other frameworks used in previously published studies, with the long-term intention of converging onto unifying theories to frame IPE.

Most of the interventions were implemented in the form of elective coursework, which may result in selection bias due to the potential increased baseline interest of participating students in IPE, the subject area in which IPE is implemented, or both. This bias may influence the interpretation of results and lead to inaccurate conclusions. Further, the implementation of IPE with discrepant participatory expectations across professions—which was the case in several reviewed studies—can also be problematic. Grouping students who are obligated to participate in IPE with other students whose participation is non-mandatory may result in unreliable data as a result of mixing different participant groups. Students who voluntarily participate may lose interest and/or commitment throughout the intervention. This was also identified as a challenge by the Canadian Interprofessional Health Collaborative's (CIHC) Accreditation Standards Committee in a recent survey of education programs (Azzam et al., 2022a). In addition to making participation in IPE compulsory for all education programs, future studies should also be cautious to group students who are at dissimilar stages of their respective professional training. This is because students can effectively participate in IPE activities and reciprocally contribute to discussions only when they possess comparable practice-based knowledge and skills (van Diggele et al., 2020).

Further, similar to previously reviewed studies (see Abu-Rish et al., 2012; Lapkin et al., 2013; Zhang et al., 2011), we observed minimal to no participation among HASC professions other than medicine and nursing. Approximately one-third of all interventions were comprised of a homogenous population of medical and nursing students *alone*. Although this high proportion of physicians and nurses is representative of the HASC workforce, it is important that IPE initiatives include and represent the broader HASC professions that would

be typically expected to work together and are part of a patient's multidisciplinary HASC team. For example, an initiative that implements IPE in a post-operative care setting requires pain management, drug administration, and consultations regarding diet, lifestyle, and mental health. Therefore, such an initiative should typically involve students from medicine, nursing, pharmacy, dietetics, physiotherapy, occupational therapy, and social work. Further, the disproportionate recruitment of participants from different HASC professions results in the potential exclusion of important, diverse professional perspectives and undermines generalizability and transferability of findings. The findings of this study should accordingly be interpreted with the understanding of the limitations of the studies reviewed, including the number and variety of HASC professions represented within the IPE interventions.

Lastly, future studies should survey IPE program coordinators, facilitators, and preceptors to gain insights on their own perspectives; include patients in IPE development and explore their perspectives to emphasize and further improve patient/client-centred care; and, assess and report how their institutions are committed to fostering IPE, including how they address challenges associated with faculty development, scheduling, and resource allocation, in addition to meeting IPE-relevant accreditation standards.

2.5.1 Limitations

There are two major limitations to this systematic review. First, we created a non-exhaustive protocol to extract data from the eligible studies. An addition of an independent expert panel to review the protocol would have added rigor to the study. We may have overlooked valuable IPE elements that may have otherwise influenced the interpretation of our findings. We addressed this limitation by evaluating the research literature to identify the types of data that have been extracted in previously published systematic reviews. Second, similar to other reviews (see Abu-Rish et al., 2012), we did not formally assess the quality of

included articles because we pursued to describe a comprehensive range of IPE activities. Our inclusion criteria that articles needed to be peer-reviewed acted as proxy for article quality.

2.6 Conclusions

This systematic review has shown that researchers in the IPE field are increasingly developing practice-based simulations, incorporating IPE into mandatory coursework, and employing qualitative methods to assess student experiences—indicating that, to some extent, the recommendations brought about in recent years have been effectuated. Nonetheless, these studies evaluated their initiatives neither for long-term impacts nor through patient/client-oriented approaches; therefore, we cannot validate whether their initiatives necessarily lead to improved patient/client-oriented outcomes. Even so, the students' perceived positive attitudes and behaviours towards IPE and IPCP following participation, as measured in these studies, are promising and show that IPE, at the very least, has potential to lead to effective IPCP and improved HASC outcomes.

Chapter 3

3 Interprofessional Education-Relevant Accreditation Standards in Canada: A Comparative Document Analysis

3.1 Abstract

Increasing evidence suggests that sustainable delivery of interprofessional education (IPE) has the potential to lead to interprofessional collaborative practice (IPCP), which in turn has the potential to lead to enhanced health and social care (HASC) systems and improved patient/client-oriented outcomes. To enhance IPE in Canada, the Accreditation of Interprofessional Health Education (AIPHE) project initiated collaborative efforts among accrediting organizations of six HASC professions to embed IPE language into their respective accreditation standards. To further understand the impact of the AIPHE project, this study evaluated the accountability of the IPE language currently embedded in Canadian HASC professions' accreditation standards documents and examined whether such language spanned the five accreditation standards domains identified in the AIPHE project. We conducted a comparative content analysis to identify and examine IPE language within the *accountable* statements in the current accreditation standards for 11 Canadian HASC professions that met our eligibility criteria. A total of 77 IPE-relevant accountable statements were identified across 13 accreditation standards documents for the 11 HASC professions. The chiropractic, pharmacy, and physiotherapy documents represented nearly 50% (38/77) of all accountable statements. The accountable statements for pharmacy, dentistry, dietetics, and nursing (registered) spanned across three-to-four accreditation standards domains. The remaining nine professions' statements referred mostly to *Students* and *Educational Program*. Furthermore, the majority of accreditation standards documents failed to provide a definition

of IPE, and those that did, were inconsistent across HASC professions. It was encouraging to see frequent reference to IPE within the accreditation standards of the HASC professions involved in this study. The qualitative findings, however, suggest that the emphasis of these accountable statements is mainly on the *Students* and *Educational Program*, potentially compromising the sustainability and development, implementation, and evaluation of this frequently misunderstood pedagogical approach. The findings and exemplary IPE-relevant accountable statements identified in this paper should be of interest to all relevant stakeholders including those countries, where IPE accreditation is still emerging, as a means to accelerate and strengthen achieving desired educational and HASC outcomes.

3.2 Background

Incorporation of IPE-relevant accreditation standards in the accreditation mechanisms of the health and social care (HASC) professional education programs is recognized as a systemic (macro-level) factor that contributes to sustainable delivery of IPE and improved patient/client-oriented outcomes (D'Amour & Oandasan, 2005; see Figure 2). The presence of IPE language in the accreditation mechanisms can only be significant, however, if it ensures that the education programs are accountable and responsive to sustainable delivery of IPE (Frenk et al., 2010; Gilbert, 2008b). Despite this important role that accreditation can play towards sustainable IPE, the Foundation for Advancement of International Medical Education and Research (FAIMER, 2020) posits that the integration of IPE in the accreditation mechanisms of the HASC professions remains fragmented globally—even in countries where IPE accreditation is relatively sophisticated (e.g., Australia, Canada, and the United States).

Within the Canadian context, analyses of the accreditation standards documents for six Canadian HASC professions revealed that, in 2005, only pharmacy explicitly addressed IPE

in their accreditation standards. At the time, Curran et al. (2005, 2006) concluded that accreditation mechanisms in Canada neither promoted nor fostered IPE. A similar comparative analysis of ten HASC professions in the United States found that, with the exception of pharmacy, there was an inadequate emphasis on IPE culture as well as an overall lack of collaborative efforts by accrediting organizations in the United States to adopt common IPE language (Zorek & Raehl, 2013). Similarly, a recent review in Australia demonstrated inconsistencies and inadequacies in standards that held education programs accountable to providing evidence of IPE (Bogossian & Craven, 2020). The findings from these studies (Bogossian & Craven, 2020; Curran et al., 2005, 2006; Zorek & Raehl, 2013) raise concerns that even when IPE language exists within the accreditation standards, not holding education programs accountable to those standards may lead to minimal sustainable delivery of IPE and ultimately lead to graduating a HASC workforce that is inadequately prepared for interprofessional collaborative practice (IPCP).

In Canada, the Accreditation of Interprofessional Health Education (AIPHE) project (2010, 2011) aimed to influence the incorporation of IPE-relevant language in the accreditation standards documents of six HASC professions: medicine, nursing, occupational therapy, pharmacy, physiotherapy, and social work. Through AIPHE, five accreditation standards domains (see Table 1) were identified: *Organizational commitment*; *Faculty*; *Students*; *Educational program*; and *Resources*. Generally, the IPE-relevant accreditation standards require institutions to dedicate resources as well as commitment to innovative and collaborative learning in support of IPE. Further, individual education programs are required to explicitly outline IPE-relevant learning objectives and assess IPE-relevant competence for their students. Lastly, faculty are required to share common IPE-relevant values that are reflected in both their teaching and clinical practice.

Since the AIPHE project (2010, 2011), a more recent case study (Grymonpre et al., 2021) of the Canadian accreditation standards documents for the same six HASC professions involved in the AIPHE project found IPE language within the documents for all six professions. This case study, however, neither systematically evaluated the *accountability* of such IPE language nor examined the extent to which such language addressed the accreditation standards domains identified in the AIPHE project. Building on this case study, the intention of this study was to understand the quality and accountability of IPE-relevant accreditation standards across the HASC professions. It is expected that this research would be a significant step towards understanding the impacts of IPE on IPCP and ultimately improving patient/client-oriented outcomes.

3.3 Methods

The present study used comparative content analysis (Martin, 2018) to evaluate the accountability of the IPE language currently embedded in 11 Canadian HASC professions' accreditation standards documents and examine whether such language spanned the five accreditation standards domains (AIPHE, 2010, 2011).

3.3.1 Identification of Health and Social Care Professions

Initially, one author (MAG) researched for existing federal regulatory organizations in addition to laws that regulate the HASC professions in each provincial (local) jurisdiction. In so doing, we identified 42 HASC professions that are regulated in at least one province in Canada (see Appendix 5). Note that we excluded the three Canadian territories from this study as their regulations are linked to other jurisdictions.

Next, we focused our query on regulated HASC professions for feasibility of undertaking this study and consistency with existing practices and research literature on IPE and IPCP. In Canada, the regulation of the HASC professions is overseen and legally mandated

by provincial governments; as some regulated HASC professions are regulated in all ten provinces, the education programs of these regulated HASC professions undergo accreditation by federal organizations. This arrangement allows accreditation to be fully operationalized and applied consistently nationwide. To ensure consistency in selecting the HASC professions, we used the following three eligibility criteria: (1) the HASC profession must have at least one federal accrediting organization; (2) the HASC profession must be regulated across all provinces; and (3) accreditation must be mandatory for entry-to-practice or program recognition by all the provincial regulatory bodies.

Of the 42 HASC professions in Canada, only 11 met our eligibility criteria: chiropractic, dentistry, dietetics, medicine, nursing (registered), occupational therapy, optometry, pharmacy, physiotherapy, psychology, and social work. In addition, medicine itself can be further subdivided into undergraduate and specialty medicine, which includes family medicine and all other medical specialties. We addressed family medicine and other specialty medicine separately in our presentation here. Hereafter, we used the profession name, as opposed to the name of the profession's accrediting organization, for simplicity purposes.

3.3.2 Locating the Accreditation Standards Documents

Except for dentistry, we located and retrieved the current accreditation standards documents in October 2020 through an online search on their respective organizations' official websites. Dentistry's current accreditation standards document was obtained by directly contacting the Commission on Dental Accreditation of Canada (CDAC).

We identified 13 accreditation standards documents for the 11 HASC professions included in this study. Three of these documents were relevant to medicine. We also noted that the Canadian Psychological Association (CPA) independently discusses its two clinical

designation streams (Clinical, Counselling, and School Psychology [CCSP] and Clinical Neuropsychology [CNP]) in the same document (CPA, 2011).

In addition, if the accreditation standards documents referenced and required compliance and adherence by HASC professional education programs to separate, supporting documents, we analyzed those documents as well. One statement in the Partnership for Dietetic Education and Practice (PDEP) accreditation standards document (2014), for example, stated that, "The curriculum is student/intern centred and based on achieving the 'Integrated Competencies for Dietetic Education and Practice (ICDEP)'" (p. 9). If the ICDEP document (PDEP, 2013) discussed such *integrated competencies* in terms of IPE, we deemed the statement to be relevant.

3.3.3 Categorization of Eligible Statements

The unit of analysis in this study was comprised of all potential IPE-relevant statements in the 13 accreditation standards documents. Employing a categorization scheme used in previous studies (Bogossian & Craven, 2020; Zorek & Raehl, 2013), these statements were categorized into one of three categories: (1) non-applicable; (2) applicable, but non-accountable; and (3) applicable and accountable (Figure 7). A *non-applicable* statement refers to a statement that we identified as potentially being relevant to IPE but upon analysis was found to be not relevant; whereas an *applicable* statement encompasses an explicit IPE-relevant expression. Applicable statements were then further categorized as either non-accountable or accountable. An *accountable* statement was one to which the accrediting organizations held their respective education programs accountable. Accountable statements were typically located within IPE-relevant accreditation standards and criteria statements. Further, a *non-accountable* statement was one to which the accrediting organizations could not hold their education programs accountable. Non-accountable statements were typically

located in titles and section headings, introductory or summative sections, flowcharts, footnotes, glossaries, and appendices. Lastly, applicable statements that either made generic reference to *examples of evidence* or were noted to be *exemplary* or *desirable* (i.e., "should…," "try to…," and "strive for") were categorized as non-accountable as such statements were not mandatory and to which accrediting organizations cannot hold their respective education programs accountable.

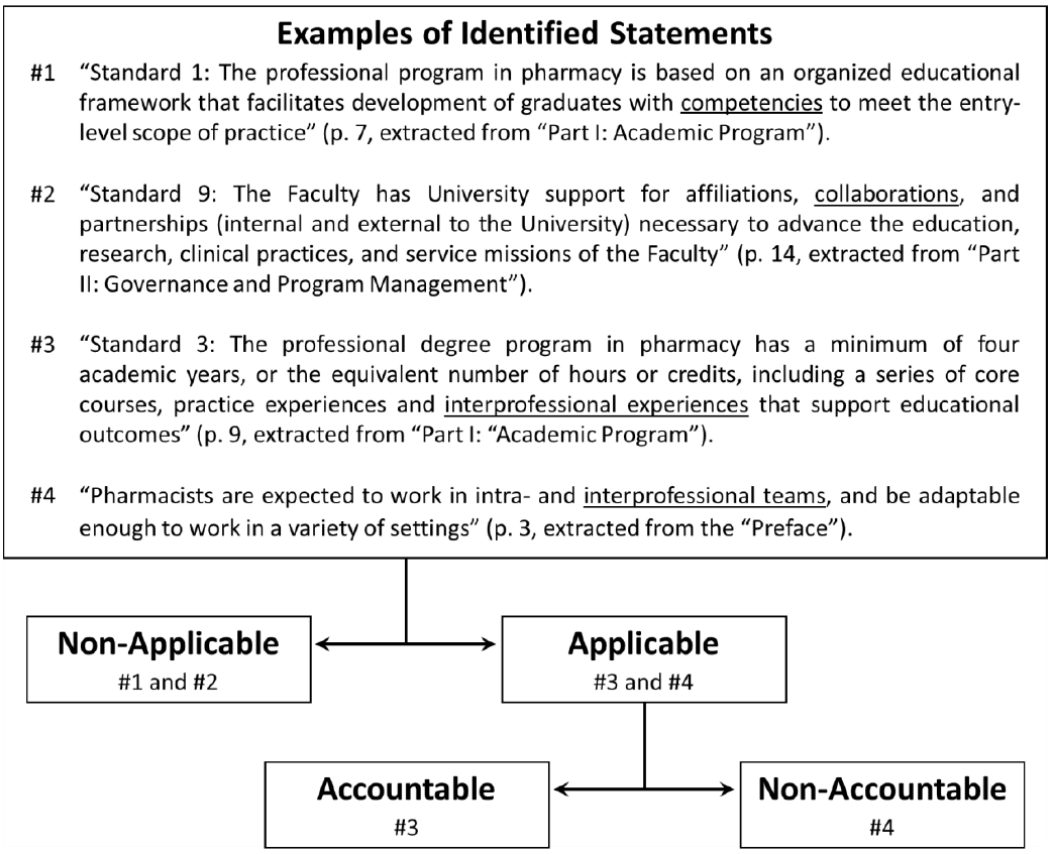

Figure 7 *Examples of the Categorization of Eligible Statements from the Pharmacy Accreditation Standards Document (2018)*. A non-applicable statement was one that may be potentially relevant to IPE but upon analysis was found to be not relevant. For instance, we cannot unquestionably determine that Statement #1 referred to interprofessional competencies. Similarly, Statement #2 described collaborative intra-institutional and inter-institutional endeavors, with no reference to IPE. An applicable statement encompassed an explicit IPE expression. An accountable statement (e.g., #3) was one to which the accrediting organizations held their respective education programs accountable. A non-accountable statement (e.g., #4) was one to which accrediting organizations could not hold their respective education programs accountable, which was located in the Preface.

3.3.4 Analysis Procedures

Initially, two authors (MA and AP) undertook a 75-minute training session, where they independently read and hand searched the pharmacy accreditation standards document (2018) and highlighted all statements containing potential IPE-relevant language. Next, they independently coded each identified statement according to the described categorization scheme. Further, using the keywords *collaboration*, *interprofessional*, and *interprofessional education*, one author (REG) and her research assistant (TP) both conducted an electronic search of the same document to confirm that no eligible statements were overlooked. Once comfortable with the coding process and the categorization scheme, we repeated this procedure for the remaining documents.

We ran Fleiss' κ to determine the inter-rater reliability of the categorization between MA and AP using IBM SPSS Statistics for Windows, Version 26 (IBM Corp., 2019). We reported mean estimations along with 95% confidence intervals (CI). Interpretation of inter-rater reliability was as follows: $x \leq .20$, poor; $.20 < x \leq 0.40$, fair, $.40 < x \leq .60$ moderate; $.60 < x \leq 0.80$, good; $.80 < x \leq 1.00$, very good (Altman, 1999). Afterwards, MA and AP compared and discussed the results of their coding process and negotiated and resolved any discrepancies that arose.

Further, MA and REG independently and deductively coded the accountable statements against the five accreditation standards domains identified in the AIPHE project (2010, 2011) and negotiated and resolved any discrepancies that arose. Lastly, we determined whether a definition of IPE was specified, or at a minimum was acknowledged, in the reviewed accreditation standards documents.

3.4 Results

For the 11 HASC professions included in this study, 13 accreditation standards documents and three supporting documents were retrieved. A total of 208 statements within these documents were deemed potentially IPE-relevant. Inter-rater reliability was substantial; concordance between the two raters was 90.38% (188/208). Fleiss' κ illustrated that there was very good agreement between the two raters, κ = .854 (95% CI, .757–.951), $p < 0.005$. Discrepancies in the remaining 20 statements were resolved through discussion until consensus was reached.

Final categorization of the 208 statements resulted in 77 (37.02%) non-applicable statements, 54 (25.96%) non-accountable statements, and 77 (37.02%) accountable statements. The non-accountable statements were found in the Introduction/Preface (*n* = 6), Table of Contents (*n* = 7), headings/subheadings (*n* = 1), within non-mandatory (e.g., examples, exemplary, and desirable) standards (*n* = 32), glossaries (*n* = 4), and appendices (*n* = 3). A perfunctory examination of the 13 accreditation standards documents revealed that chiropractic, pharmacy, and physiotherapy documents represented nearly 50% (38/77) of all accountable statements, whereas the optometry document contained no accountable statements. Table 2 illustrates the number of categorized statements for each HASC profession.

Table 2 *Categorization of Statements Potentially Relevant to Interprofessional Education*

Profession	Non-applicable	Non-accountable	Accountable
Chiropractic	0	1	11
Dentistry	3	1	6
Dietetics	2	0	9
Family medicine	14	3	4
Nursing (registered)	13	4	7
Occupational therapy	2	3	3
Optometry	0	0	0
Pharmacy	10	29	13
Physiotherapy	9	6	14
Psychology (CCSP)	5	3	0
Psychology (CNP)	4	2	1
Social work	2	0	1
Specialty medicine	12	1	7
Undergraduate medicine	1	1	1
Total of 208 (%)	77 (37.02%)	54 (25.96%)	77 (37.02%)

CCSP, Clinical, Counselling, and School Psychology; CNP, Clinical Neuropsychology; HASC, health and social care.

Figure 8 illustrates which of the five accreditation standards domains identified in the AIPHE project (2010, 2011) were addressed in the accountable statements for each HASC profession. The most common domains across HASC professions (*n* = 13) were *Educational Program* (*n* = 10; 76.92%) and *Students* (*n* = 9; 69.23%). The accountable statements for pharmacy alone spanned four of the five accreditation standards domains, whereas the accountable statements for dentistry, dietetics, and nursing (registered) spanned three of these domains. The domains covered by the other HASC professions spanned from zero to two domains. Further, it was noted that for eight of the HASC professions (dentistry, dietetics, medicine [family and specialty subdivisions], nursing [registered], occupational therapy, pharmacy, physiotherapy, and psychology [CNP]), the accountable statements that addressed *Educational Program* made reference to practice-based learning.

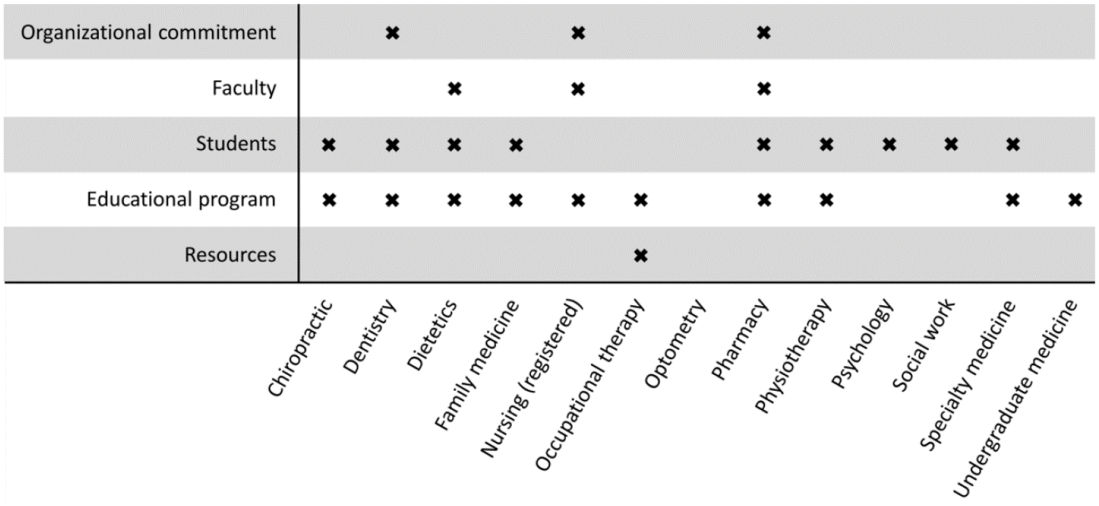

Figure 8 *Coding of Accountable Statements Across Accreditation Standards Domains (AIPHE, 2010, 2011)*

Table 3 illustrates a sampling of exemplary accountable statements extracted from the accreditation standards documents spanning the five accreditation standards domains identified in the AIPHE project (2010, 2011; see Appendix 6 for all accountable statements).

Table 3 *Exemplary Accountable Statements Across Accreditation Standards Domains*

Domain	Exemplary Accountable Statement
Organizational Commitment	"The University has integrated and endorsed the concept of interprofessional education and collaboration in practice" (Canadian Council for Accreditation of Pharmacy Programs, 2018, p. 16).
Faculty	"Preceptors are academically and experientially qualified for their role in assisting interns to achieve the ICDEP" (Partnership for Dietetic Education and Practice, 2014, p. 13).
Students	"Students should be exposed to the principles of interprofessional collaboration for the provision of patient care" (Commission on Dental Accreditation of Canada, 2013, p. 30).
Educational Program	"The program provides opportunities for learners to develop knowledge, skills, and attitudes in using relevant information, communication technology, critical thinking, and clinical reasoning, in the delivery of collaborative client-centered care" (Canadian Association of Schools of Nursing, 2014, p. 25).
Resources	"A report that documents the IPE activities and experiences integrated in the occupational therapy program. The report should describe the program offerings, and include considerations of space, human and learning resources required to deliver IPE" (Canadian Association of Occupational Therapists, 2019, p. 19).

ICDEP, Integrated Competencies for Dietetic Education and Practice; IPE, interprofessional education.

Lastly, only four of the 13 accreditation standards documents (for family medicine, occupational therapy, physiotherapy, and specialty medicine) included a definition of IPE. Family and specialty medicine cited their definitions from the CanMEDS framework (Frank et al., 2015; Shaw et al., 2017), which in turn cited the Royal College of Physicians and Surgeons of Canada (RCPSC, 2012). Further, the documents for both occupational therapy and physiotherapy cited adapted versions of the globally accepted definition from CAIPE (2016). Of significance, the definitions from family and specialty medicine excluded a key component for IPE—learning *with*, *from*, and *about* each other.

3.5 Discussion

In this study, we undertook an assessment of IPE language embedded within the 13 current accreditation standards documents for 11 regulated HASC professions in Canada. Our analysis revealed that the number of accountable IPE-relevant accreditation standards contained in these documents ranged from zero (for optometry, psychology [CCSP program; CCSP internship; and CNP internship]) to over ten (for chiropractic, pharmacy, and physiotherapy). Nonetheless, we caution against judging the quality of IPE-relevant accreditation standards strictly by the number of accountable statements in each document. The AIPHE project (2010, 2011) was careful to not mandate a particular structure or content to the standards. Rather, guiding principles involved the adoption of a common lexicon, focusing on the common mandate of IPE as opposed to professional differences, and allowing for flexibility in how each accrediting organization developed their standards and collected their evidence.

That being said, the presence of IPE language contained within *accountable* statements in accreditation standards documents is critical as it provides the accrediting organizations the authority to look for evidence of IPE in the education programs they accredit

and hold those programs accountable and responsive to meeting these standards. The absence of IPE language in the accreditation standards documents for optometry and psychology (CCSP program; CCSP internship; CNP internship) implies a lack of incentive for these programs to deliver sustainable, evidence-based IPE.

Of greater significance than the absolute number of accountable statements, however, was our finding that the accountable standards for most professions spanned only two of the five accreditation standards domains (*Students* and *Educational Program*). Only the accountable statements for pharmacy spanned four domains (*Organizational Commitment*, *Faculty*, *Students*, and *Educational Program*). It was reassuring, however, to see that in addressing the *Educational Program* domain, eight of the 13 accreditation standards documents reviewed in this study referenced practice-based IPE in one or more accountable statements. To date, there has been limited global emphasis on advancing practice-based IPE compared to course-based IPE. The hypothesis is that practice-based accreditation standards would incentivize innovative practice-based IPE (Grymonpre et al., 2021).

While emphasis on *Educational Program* and *Students* is of obvious importance, a lack of emphasis on the other three domains potentially hinders sustainable delivery of IPE within post-secondary institutions (Grymonpre et al., 2016a). The D'Amour framework (D'Amour & Oandasan, 2005) illustrated the micro–, meso–, and macro–level factors (see Figure 2) that must be addressed when delivering IPE within the education system. In addition to emphasis on education programs and student learning, the framework identifies *Organizational Commitment* and the allocation of adequate *Resources* as essential meso-level factors that influence the sustainable delivery of IPE. Further, the framework emphasizes the key roles of *Faculty* and faculty development as critical to offering theoretically grounded and evidence-based IPE. At the micro-level, faculty are essential to fostering a culture that enables positive interprofessional learning interactions as opposed to a *hidden curriculum* that fuels

stereotypes, miscommunication, and mutual distrust among students of different HASC professions (Braithwaite et al., 2016; Thurston et al., 2017), which, in turn, generates HASC practitioners who are unable to effectively collaborate within an interprofessional team. Hence, incorporating IPE language across the five pillars of accreditation standards domains is imperative. That being said, data supporting the impact of accreditation on the quality of education programs and further the impact on graduates' performance in practice-based environments, and ultimately on the quality of patient/client-centred care is complex and our current understanding is limited. Blouin (2020) has recently proposed a framework of outcome markers to guide future research in this emerging area.

Further, it was noteworthy that inductive analyses of the accountable statements within ten HASC professions' accreditation standards documents in the United States (Zorek & Raehl, 2013) found that the IPE language also spanned five major domains (*IPE Inclusion in Mission and Goals*, *IPE Responsibilities of the Dean*, *Allocation of Budgetary and Fiscal Resources to IPE*, *IPE Inclusion in Curricular Programs and Defined Learning Outcomes*, and *Student Competencies*). These categories generally paralleled four of the five accreditation standards domains identified in the AIPHE project (2010, 2011), with only *Faculty* not addressed in the United States' analysis. Hence, it seems that the scope of IPE-relevant standards determined by both Canadian and the United States' collaborative efforts were closely aligned, in essence serving as a validation of the domain categories, and further underscoring the recommendation that implementation of sustainable, evidence-based IPE innovations requires accreditation standards that span all five domains.

It was also noteworthy that in this study, with the exception of family medicine, occupational therapy, physiotherapy, and specialty medicine, most accreditation standards documents failed to provide definitions for IPE—a finding similar to Bogossian & Craven's (2020) findings in Australian accreditation standards documents. The globally accepted

definition of IPE is that from CAIPE (2016). To ensure delivery of evidence-based and theoretically informed IPE, it is imperative to have a common understanding across all relevant stakeholders of what IPE is and what it is not (AIPHE, 2010, 2011). For example, an interprofessional panel presentation to a group of students from various HASC professions, is not IPE, as this activity comprises one-way exchange of knowledge with no interaction among learners from different professions and therefore no opportunities for them to learn *with*, *from*, and *about* each other. Therefore, the lack of a definition of IPE in most accreditation standards documents and the missing text "with, from and about" from the definitions from family and specialty medicine are concerning and need to be addressed.

The greatest limitation to this study was exclusion of the 31 HASC professions that did not meet our eligibility criteria. Our findings are limited to the 11 HASC professions reviewed and can neither be representative nor generalizable to other professions without further investigation. Further, most accreditation standards documents failed to provide definitions for IPE; thus, we could only assume that when they referenced IPE language, they were all referring to IPE as defined by CAIPE (2016). Lastly, this study examined the accreditation standards documents for IPE-relevant statements to which accrediting organizations can hold their respective education programs accountable, but did not examine types of evidence provided by the education programs in meeting these standards across all five accreditation standards domains (AIPHE, 2010, 2011). A team of CIHC researchers has subsequently conducted a national survey (Azzam et al., 2022a) to address this research goal.

3.6 Conclusions

This research provided an informative update on the incorporation of IPE into the accreditation standards of a large number of HASC professions in Canada. Though evidence of the real-world impact of such standards is scant, and measurement and attribution of team

performance is quite challenging, this study can be seen as providing early evidence of the relative value of IPE as judged by national leadership in a large number of HASC professions.

The AIPHE project's (2010, 2011) approach that aimed to embed IPE language into the accreditation standards for six Canadian HASC professional education programs appears to have directly or indirectly influenced several other Canadian HASC professions not involved in AIPHE. The standards for chiropractic and psychology are cited as having a publication year of 2011—the same year as the AIPHE guidelines, thereby suggesting that such professions may not have had the opportunity to review their guidelines and incorporate adequate IPE language before they last published an update to their standards. More interestingly, the professions with the least thematic coverage are among those that have more recently updated their standards (optometry and undergraduate medicine).

Further, this study found that IPE language in the accountable statements within a majority of HASC professions' accreditation standards documents were mostly relevant to *Students* and *Educational Program*. The emphasis within the *Educational Program* on practice-based IPE was especially noteworthy. The authors suggest these standards could be even more comprehensive and explicit. The lack of emphasis on *Resources* and *Organizational Commitment* raises concerns regarding sustainable delivery of IPE within any given institution. Further, the lack of emphasis on *Faculty* raises concerns about the quality of IPE being offered. To enable evidence-based IPE and IPCP, it is our recommendation that all relevant stakeholders including accrediting organizations and HASC professional education and delivery systems in Canada and elsewhere, adopt a common definition of IPE—the most widely accepted definition provided by CAIPE (2016). We assert that the adoption of the findings and exemplary IPE-relevant accountable statements highlighted in this article will be of global relevance, especially for those countries where accreditation and more specifically, accreditation of IPE, are still emerging.

Chapter 4

4 Situating Interprofessional Education Curriculum within a Theoretical Framework for Productive Engaged Learning: Integrating Epistemology, Theory, and Competencies

4.1 Abstract

Interprofessional education (IPE) has a longstanding presence in the health and social care (HASC) professions, by which its sustainable implementation in HASC professional education has potential to effectively prepare HASC professional students for interprofessional collaborative practice (IPCP). Implementation of IPE has increased over the last two decades with the emergence of a curriculum guided by constructivist epistemology and learning theories that emphasize demonstrating competence in practice. Nonetheless, most IPE initiatives since the early 1960s—when IPE first emerged—have been sporadic and lacked guidance through theoretical underpinnings. In this conceptual paper, we first discuss why it is important to have theory drive HASC professional education. We next explore what is meant by *curriculum*, followed by a discussion on the importance of curriculum theory to HASC professional education processes. We then illustrate the learning theories—arising from behaviourist and constructivist epistemologies—that inform curriculum theory in the HASC professions, with particular emphasis on how constructivist learning theories inform IPE. Lastly, we propose a theoretical framework for productive engaged learning in the professions through which IPE opportunities may be grounded—leading to student proficiency in interprofessional professional competencies (knowledge, skills, and dispositions), establishment of professional communities of practice, and eventual improvement of patient/client-oriented outcomes.

4.2 Background

Within the context of interprofessional education (IPE), theory-driven and informed educative practices are necessary to help guide educators develop and implement interprofessional opportunities through which student-centred and patient/client-oriented outcomes can be sustained over time and into practice (D'Amour, D., & Oandasan, 2005; Grymonpre et al., 2010). Health and social care (HASC) professional education, however, has traditionally overlooked using theory to inform its practices, resulting in the lack of epistemological cohesiveness between prevailing and contemporary educational theories and what is taught and done in HASC professional education and practice (Azzam et al., 2022b). This has been seen as a barrier towards promoting pedagogical approaches that lead to intended student learning outcomes. A recent systematic review (Chapter 2; Azzam et al., 2022b) has demonstrated that most IPE research literature (62%) pays minimal attention to employing theory—a consistent finding that has been observed for decades (Abu-Rish et al., 2012; Lapkin et al., 2013; Zhang et al., 2011). Realizing the dearth of intentional theory amalgamation in IPE practices, we propose here a theoretical framework for productive engaged learning for IPE that integrates epistemology, theory, and professional competencies.

We begin our presentation by first discussing why it is important to have theory drive HASC professional education and HASC professional education research. Since HASC professional education is manifested through interactions and experiences with HASC curriculum, we next explore what is meant by *curriculum*, followed by a discussion on the importance of curriculum theory to HASC professional education processes. We then illustrate the learning theories—arising from behaviourist and constructivist epistemologies—that inform curriculum theory in the HASC professions, with particular emphasis on how constructivist learning theories inform IPE. Lastly, we propose a theoretical framework for

productive engaged learning in the professions through which IPE opportunities may be grounded, whereby HASC professional students interact and learn with, from, and about each other, make meaning of such experiences, and employ their interprofessional knowledge, skills, and dispositions in practice.

4.3 Significance of Theory for Health and Social Care Professional Education

We identify three reasons why HASC professional educators and researchers have overlooked using theory to inform their practices (Reeves & Hean, 2013). First, HASC professional educators and researchers often trained in post-positivist experimental research traditions might view themselves as being atheoretical, having no affiliation or concern to theoretical perspectives. Second, they might have an underdeveloped or incomplete understanding of the breadth and depth of theories that inform their practices. Third, they might believe that theoretical assumptions informing their practices might already be known and thus unnecessary to present them in their research publications, presentations, and other forms of output.

We contend, however, that this notion—that HASC professional educators and researchers consider themselves to be pragmatic, clinically oriented individuals who assert that theory has little practical relevance to their practices—is misplaced. No matter how pragmatic or clinically oriented we are, our purposeful actions and practices are guided by certain conscious or subconscious assumptions about what constitutes reality (ontology) and how knowledge is created (epistemology). As such, theory guides us to make our assumptions about how the world works and is visible to us and others. In other words, theory offers transparency and anchoring of the assumptions that inform our practices and actions (e.g., related to research/teaching).

Theory and educative practices inform each other and are intricately tied, where theory is iteratively tested and modified in various learning contexts (i.e., theory testing). Additionally, theories can be used to develop and test different curricular and pedagogical approaches (Figure 9). For instance, a behaviorist theoretical perspective sees the learner as an *object* that can accommodate information and be trained when appropriate stimuli are provided. Behaviourism is an embodiment of materialism—the doctrine that denies that the mind is an independent entity of material processes (e.g., the biochemistry of the human brain and associated body systems). Therefore, practice might focus on providing external stimuli (positive/reward or negative/punishment) for learning and assessment. Meanwhile, a constructivist theoretical perspective sees the learner as a *subject* who has agency to make sense of their social and physical interactions by making cognitive connections to their existing knowledge, experiences, and assumptions about how the world works. In this instance, practice might focus on providing an environment that allows the learner to construct their own meaning from their experiences.

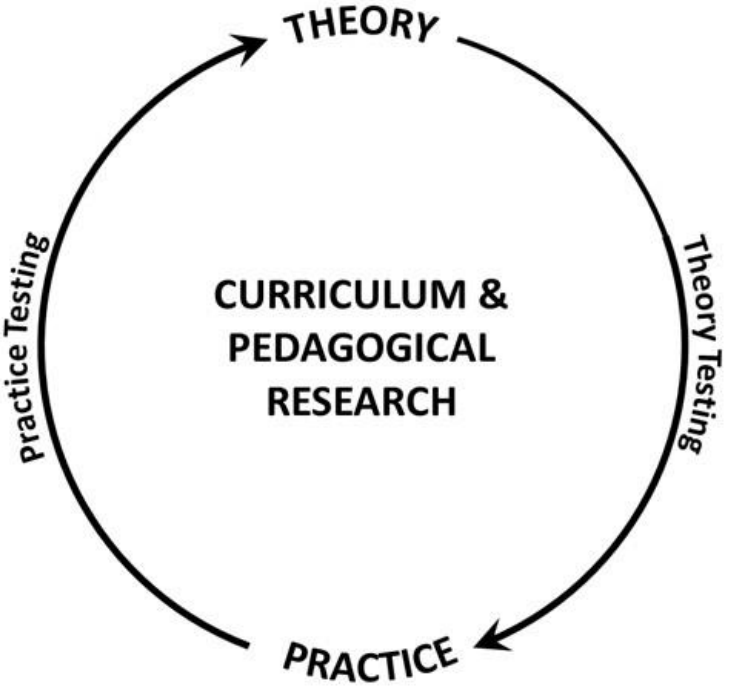

Figure 9 *Theory-Practice Iterative Cycle*

Additionally, theory helps us better understand presented research and allows us to have insights about the underlying assumptions of practice, action, beliefs, and worldviews. It also helps us as readers of research to interrogate, critique, evaluate, and possibly adopt research findings, practices, actions, and beliefs. Theory provides us with the necessary framework or scaffolding to improve and make modifications to presented findings, practices, etc. Theory helps with stability of interpretation of research. That is, reliable analysis and interpretation of research data is facilitated by the use of theory in that it helps hold fast and stabilize the assumptions that guided the research process, including the analysis and interpretation of research, and avoid spurious and extemporaneous attempts to analyze and interpret data. Moreover, the use of theory contextualizes and provides a boundary for the validity of the presented findings.

4.4 Curriculum in Health and Social Care Professional Education

More than a century ago, Abraham Flexner was petitioned by the Carnegie Foundation for the Advancement of Teaching to examine the state of North American medical schools, which were predominantly privately-owned institutions that mostly employed part-time instructors, offered non-standardized curricula, and were neither associated with hospital facilities nor universities. At the time, Flexner (1910) recommended that medical education undergo major curricular reforms, by which they become integrated into public universities and become associated with teaching hospitals, whereby physicians undertake primary roles in curriculum development, teaching, and research, in addition to their clinical responsibilities.

The term *curriculum* is a broad concept with multiple schools of thought. Its etymology comes from the Latin verb *currere*, which translates to “to run a course.” For Joseph Schwab (1983),

> Curriculum is what is successfully conveyed to differing degrees to different students, by committed teachers using appropriate materials and actions, of legitimated bodies of knowledge, skill, taste, and propensity to act and react, which are chosen for instruction after serious reflection and communal decision by representatives of those involved in the teaching of a specified group of students who are known to the decision makers. (p. 240)

Supporting Schwab's (1983) definition, Dillon (2009) argues that any definition of the term *curriculum* must describe: (1) its *nature* (e.g., What is its essence, substance, and properties?); (2) its *elements* (e.g., Who, whom, and what are involved? Where, when, why, and how does it take place?); and (3) its *practice* (e.g., How do we think about it? What actions should we take?). Curriculum researchers explore, examine, and revise contemporary curriculum through the field of Curriculum Studies. Studying historical and contemporary education programs through Dillon's questions involves an exploration of the interconnectedness among these components (nature, elements, and practice). Further analysis and critique of contemporary challenges, difficulties, and weaknesses allow us to be in line with society's evolving social, cultural, and political landscapes, potentially leading to improved curricula and learning opportunities. For instance, following Dillon's ideas on curriculum, our presentation examines the challenges in IPE curriculum in terms of its adherence to theoretical frameworks and the use of these frameworks in implementing IPE. Further, curriculum theorist Michael Young (2014) postulates that,

> It is such goals that give purpose to curriculum theory just as it is better treatment and better medicines that give purpose to medical science. … It is curriculum theory that should enable us to analyze and critique its different forms, and hopefully develop/propose better alternatives. (p. 197–198)

Hence, curriculum theorists have over the past several decades continuously and discursively defined, contextualized, and critiqued HASC professional curricula, thereby influencing an educational paradigm shift from behaviourist to constructivist *learning theories* (Table 4; Frank et al., 2010; Gilbert, 2008a; Morcke et al., 2013). While intricately connected, *curriculum theories* and *learning theories* are inherently different. While curriculum theory informs the development, enactment, and recontextualization of the curriculum, *learning theory* can be defined as a "coherent framework of integrated constructs and principles that describe, explain or predict how people learn" (Braungart et al., 2014, p. 71). In other words, curriculum developers and educators employ a variety of learning theories to enact their pedagogical strategies within their curriculum. Because learning theories are situated within diverse epistemological paradigms, it is important that curriculum developers ensure that their learning theories and curriculum theories are epistemologically aligned.

Table 4 *Curriculum Theories and Relevant Learning Theories in Health and Social Care Professional Education*

Epistemology	Curriculum theory	Relevant Learning theories
Behaviourism	"School as factory" analogy (Bobbitt, 1912); Tyler's Rationale (1949)	Behaviourist theory of learning (Thorndike, 1903)
Constructivism	Process model of education (Stenhouse, 1975)	Adult learning theory (Knowles, 1968); Theory of experiential learning (Dewey, 1916, 1938; Kolb, 1984); Theory of social constructivism (Vygotsky, 1978); Theory of situated learning (Lave & Wenger, 1991; Wenger, 1998)

4.4.1 Curriculum Theory and Behaviourism

Behaviourist theory of learning (Thorndike, 1903) posits that, much like Skinner's notion of operant conditioning (Skinner, 1938), learning is merely a response or reaction to an external, environmental stimulus (e.g., being taught by an instructor); in this manner, learning is essentially passive, where the learner is simply a *vessel* that is *filled* with information by the teacher (Hickey, 2014). John Franklin Bobbitt built on Thorndike's work and theorized that the curriculum must be based on pre-defined objectives. In his seminal paper, *The Elimination of Waste in Education*, Bobbitt (1912) applied Taylor's (1911) concepts

of scientific management in factory production to pedagogical and curricular design. Bobbitt describes students as raw materials, which should be processed by teachers (workers) in schools (factories), so that the students can be transformed into competent graduates (useful products). He argues that such transformation must occur according to pre-defined standards and objectives (quality control). Bobbitt (1920) suggests that,

> The objectives and the objectives alone … dictate the pupil experiences that make up the curriculum. It is then these in their turn that dictate the specific methods to be employed by the teachers and specific material helps and appliances and opportunities to be provided. … And, finally, it is the specific objectives that provide standards to be employed in the measurement of results. (as cited by Au, 2011, p. 26–27)

Further, Bobbitt postulates that the curriculum must be prescriptive (Heydon & Wang, 2006) in that teachers and learners alike should have no contribution to the creation of the curriculum. Instead, he stresses that determining what is learned and how it is learned rests solely within the jurisdiction of the administrators and government (the managers of the factories). He highlights that,

> The burden of finding the best methods is too large and too complicated to be laid on the shoulders of the teachers. … The ultimate worker, the teacher in our case, must be a specialist in the performance of the labor that will produce the product. (as cited by Au, 2011, p. 27)

Ralph Tyler (1949) advanced Bobbitt's approach to education by emphasizing that objectives must be specific and pre-determined, and these must be met within a specific time period (e.g., medical school in four years). Tyler's notion of curriculum was primarily focused on meeting pre-defined objectives with little consideration to the dynamic processes of

learning and students' experiences (Gruppen et al., 2012). By the end of the 20th century, this curriculum model contained within itself the seeds of its own destruction—among other factors—resulting in significant consequences that Flexner and others may have neither anticipated nor intended.

4.4.2 The Need for Curriculum Reconceptualization in Health and Social Care Professional Education

Towards the turn of the 21st century, reconceptualization of the above behaviourist-oriented, time-based curriculum model began to take place in HASC professional education in response to evolving global demographic and socioeconomic profiles, e.g., ageing populations, epidemics partly induced by poverty, conflict, and climate change, and rising HASC-associated costs (Campbell et al., 2014; Murphy et al., 2017, 2019; Towle et al., 2016). Further, the limitations of this curriculum model itself are embodied in its incapability to address individual learner needs and to mitigate the siloed nature of the HASC professions.

First, by emphasizing the behaviourist-oriented learning objectives, this curriculum model prioritizes often superficial memorization and good grades over developing deep and critical understanding, skills, and dispositions leading to clinical competence. These three competencies (knowledge, skills, and dispositions) must be interwoven throughout the HASC professional curriculum so that students are empowered to become critical and agentic practitioners of their professions (Brantley-Dias et al., 2021; Jacobs & Schalkwyk, 2022). Similarly, by undermining the processes of educational experiences, this curriculum also neglects context in which learning occurs, the needs of the individual learner, and the importance of learner-teacher and learner-learner interactions in the development of knowledge, skills, and dispositions (Gilbert, 2008b).

Second, this curriculum's emphasis on narrow, behaviorist-oriented outcomes led to strict profession-specific learning, where students of the same HASC profession learned together and minimally interacted with those from other professions. According to Bloom (2004), "[with] increased specialization and separation of disciplines, people are becoming increasingly disconnected from the broad connecting conceptions within disciplines [and] the patterns that bridge [these] disciplines" (p. 6). As such, students who learn together, whether consciously or subconsciously, ultimately create an often-stereotypical *classification*[6] that defines their collective identity as a distinct and exclusive professional group. For instance, when medical students learn only with other medical students, they classify themselves as *we*, and distinguish all other students as *them*. Such framing typically results in stereotypes and miscommunication, as well as a lack of mutual respect and trust between and across diverse HASC professions (Braithwaite et al., 2016; Thurston et al., 2017). This approach to learning typically generates individualistic and isolated practitioners who would not be able to successfully collaborate in clinical settings, resulting in interprofessional conflict and lack of patient/client-centredness in the diagnosis, treatment, and management of disease and illness (Gilbert, 2008b).

It is important to note that HASC professional education has not completely shifted from a time-based model focusing on meeting pre-defined objectives to a competency-oriented model; rather, these influences have been dynamic, where curriculum developers have increasingly adopted a hybrid approach that focuses on meeting specific objectives as well as individualized learning processes—influenced by constructivist learning theories.

[6] Bernstein (1996) defines a *classification* as "the degree of boundary maintenance between [disciplines]" (p. 158), where strong boundaries create strong classifications.

4.4.3 Curriculum Theory and Constructivism

Increased pressure for the reconceptualization of the time-based, behaviourist-oriented curriculum led to the development of constructivist-oriented curriculum models, in which the implementation of IPE would become an integral component. Many curriculum theorists (e.g., Apple, Bevis, Burton, Pinar, etc.) refused and counteracted Tyler's Rationale (1949) in attempt to *de-objectify* the curriculum (Pinar, 2017) and make the prescriptive curriculum more adaptable. Perhaps one of the most influential thinkers who contributed to the conceptualization of the competency-oriented curriculum is the British curriculum theorist, Lawrence Stenhouse.

In his *process model of education*, Stenhouse (1975) describes that any educational process should have four main components, which should be addressed in a rather cyclic and interactive manner: (1) Training; (2) Instruction; (3) Initiation; and (4) Induction. Further, he posits that the behaviorist-oriented model can be applied to *training* and *instruction*, but not to induction. He argues that *induction* involves the generation of unpredictable outcomes (e.g., the translation of knowledge into practice); therefore, induction requires, by necessity, that students apply their knowledge, skills, and dispositions in real world settings, rather than simply memorize and get good grades within contrived contexts (Petrina, 2004). According to Stenhouse, "education as induction into knowledge is successful to the extent that it makes behavioural outcomes of the students unpredictable" (p. 82). Hence, such unpredictable outcomes should not be pre-determined, for doing just that would distort the very nature of learning. This is not to say that Stenhouse calls for the elimination of intended learning goals; Bloom (2004) makes this distinction, stating that "teachers cannot necessarily predict the outcomes of instruction in terms of what is typically referred to as specific *learning outcomes*. On the other hand, learning goals, which describe general characteristics of student learning, can be described" (p. 19).

By understanding the sociocultural processes involved in the development of knowledge, skills, and dispositions, Stenhouse (1975) defines *curriculum* as “an attempt to communicate the essential principles and features of an educational proposal in such a form that it is open to critical scrutiny and capable of effective translation into practice” (p. 4). This definition of *curriculum* that emphasizes the educational processes rather than the outcomes, we argue, restores it to its very own etymology (*currere*—"to run a course”). Fundamentally, the curriculum must be *lived*. This narrative is made clear by Thomas Hopkins (1941), who argues that the curriculum “must be as flexible as life and living. It cannot be made beforehand and given to pupils and teachers to install” (p. 13). In this manner, the reconceptualization of the curriculum in the HASC professional education was founded upon constructivist approaches.

Constructivism (Piaget, 1936) employs the notion that learning should neither be static nor prescribed; rather, learning is an active and dynamic process, where students construct their own subjective, relational, and situational understandings (Tilley & Taylor, 2013) of taught course materials through the *lived* curriculum (Johnson-Mardones, 2018). Thus, learners “are not empty vessels waiting to be filled, but rather, active organisms seeking meaning” (Driscoll, 2005, p. 387). In this manner, “teaching is not merely instruction, but the systematic promotion of learning by whatever means” (Stenhouse, 1975, p. 24), with the focus on the *means* (educational processes) rather than the outcomes. Naturally, such learning should occur in safe learning environments, where students are permitted to voice their thoughts, opinions, and beliefs, as well as engage in *reflection-in-action* and *reflection-on-action* practices (Schön, 1987). In so doing, students of different HASC professions who participate in IPE contend with complex topics such as hierarchy and stereotypes, thus providing a mechanism for establishing norms for respectful collaboration and building trust within their interprofessional teams (Oandasan & Reeves, 2005). People who “can interact

without misunderstanding do so on the consensus of meanings … dependent upon a deeper consensus of values" (Stenhouse, 1975, p. 122), where such values accentuate mutual trust, reflectivity, and collaboration.

4.5 A Theoretical Framework for Productive Engaged Learning in Interprofessional Education

As a lead up to this section, in the previous sections we briefly presented a rationale for why HASC professional education and research should be theoretically driven. Additionally, we presented curriculum, the study of curriculum, and curriculum theory as they relate to HASC professional education. In our presentation, we emphasized the natural alignment among epistemology (how we know), curriculum theory, and learning theory and the movement away from behaviorist-oriented towards constructivist-oriented notions of learning. In this section, we present our theoretical framework for productive engaged learning for IPE. In presenting our theoretical framework, we underscore the idea of productive engaged learning. That is, we put forward the notion that learning experiences in IPE need to be authentic in that they need to be productive and engaging for the students (Verma et al., 2015). Productive engagement allows the learners to "understand and examine the architecture" of their learning experiences (p. 272). Hence, we believe that the theoretical framework presented here facilitates productive engaged learning in IPE.

The theoretical framework is represented through concentric circles, where moving from the outermost circle to the innermost circle we see *Epistemology, Curriculum theory, Learning theories,* and *Competencies.* As discussed earlier, we put forward a constructivist (Piaget, 1936) epistemology for describing how we come to know what we know within the HASC professional education context. Aligning with the constructivist paradigm, we also presented the process model of curriculum theory (Stenhouse, 1975). Again, in alignment with

the presented epistemology and curriculum theory, we put forward experiential learning, situated learning, and social constructivism as learning theories. In the next section, we discuss these learning theories. The innermost circles of the framework representation present the competencies that need to be developed as part of an IPE program. We also present a discussion of these competencies below.

While the framework presents a considerably comprehensive depiction of how HASC professional education ought to be epistemologically and theoretically grounded, we would also like to advance the idea that for HASC educators and students, the two inner circles of the framework, namely *Learning theories* and *Competencies*, should subsume the learning experiences and contexts. We adopt the view that HASC student experiences need to encompass the interplay of three learning theories—the theory of experiential learning (Dewey, 1916, 1938; Kolb, 1984), the theory of social constructivism (Vygotsky, 1978), and the theory of situated learning (Lave & Wenger, 1991; Wenger, 1998)—and professional competencies (knowledge, skills, and dispositions). When this occurs, authentic and meaningful learning is advanced, thereby leading to the establishment of communities of practice and the improvement of HASC delivery systems through the implementation of interprofessional collaborative practice (IPCP). The interplay of learning theories and professional competencies can be presented as an analogy of a woven cloth, where the three learning theories and the three competencies are represented by threads that are woven to make a cloth (an entire HASC learning experience; Figure 10).

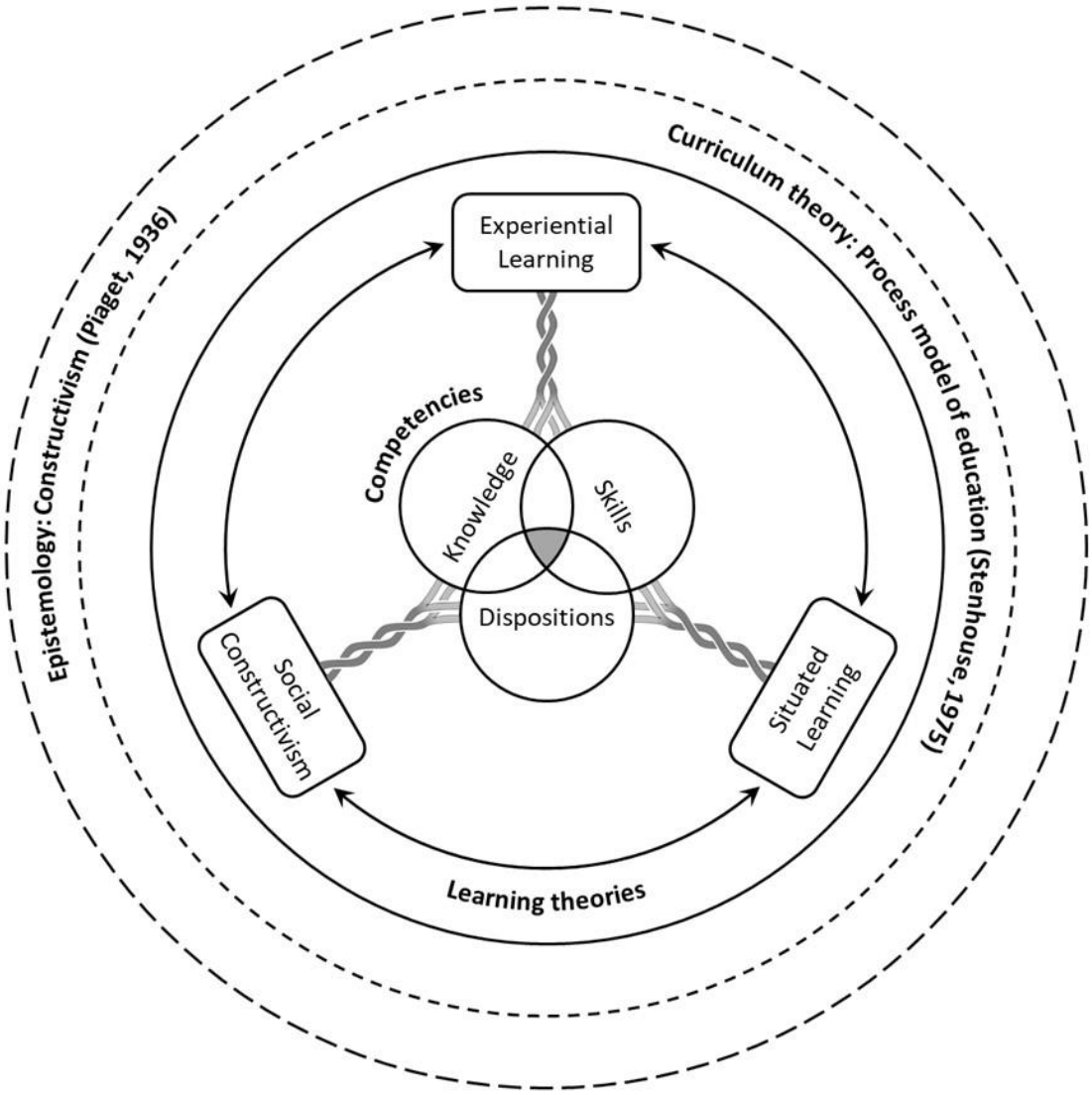

Figure 10 *A Visual Representation of the Theoretical Framework for Productive Engaged Learning for Interprofessional Education*

4.5.1 Generalized Learning Theories Supporting Health and Social Care Professional Education

In the previous section we advanced the idea that the constructivist-oriented curriculum paradigm best suits contemporary HASC professional educative practices. In line

with this, in this section we highlight three generalized and interrelated learning theories that support HASC professional education and IPE in particular.

4.5.1.1 Theory of Experiential Learning

The theory of experiential learning (Dewey, 1916, 1938; Kolb, 1984) describes the cyclical nature in which students engage in purposefully designed concrete learning experiences that are interrogated through reflection and subsequently conceptualized (learned) and enacted (tried)—a critical component of IPE. The theory of experiential learning is founded upon the construct that learning is not a means to an end, but rather a continuous process grounded in social interactions and experiences. In this respect, experiential learning can offer situations that are unpredictable and occur in authentic contexts. This offers a multidimensional learning experience for the students, where they are engaged in problem posing and solving, critical reflection and analysis, and interacting with others and the physical environment. As such, within the context of HASC professional education and IPE, experiential learning processes involve students who learn *with*, *about*, and *from* each other, where they interact collaboratively and reflect on diverse perspectives in a trustworthy, but an accountable, environment. For instance, these interactions allow students in medical, nursing, pharmacy, and physical therapy professional education programs to learn how to solve complex HASC problems, such as post-stroke care, and to make sound patient/client-centred decisions regarding diagnosis, treatment, and management of disease (Clark, 2009).

4.5.1.2 Theory of Social Constructivism

Both cognitive and social constructivism are pertinent for understanding the meaning-making processes involved in the implementation of IPE. Cognitive constructivism describes how learning occurs from a neurodevelopmental perspective (Piaget, 1936). Because it is through interactions with others and the environment, however, that individuals engage in

the meaning-making process (Creswell & Poth, 2018), social constructivism is, indeed, more relevant than cognitive constructivism within the context of IPE (Hean et al., 2009). Within the social constructivist paradigm, there is the notion of decentering the role of the teacher and an emphasis that the students are not passive learners; rather, that they are active constructors and re-constructors of their own knowledge and that their social experiences are key in such knowledge construction (Vygotsky, 1978). Certainly, recognizing the principles of social constructivism is crucial when implementing this contemporary curriculum model, where IPE is encouraged and students learn *with*, *about*, and *from* each other (Centre for the Advancement of Interprofessional Education, 2016). In our post-stroke care example above, the students socially construct their knowledge about diagnosis, treatment, and management plans through interactions with each other, mentors, and patients/clients.

4.5.1.3 Theory of Situated Learning

The theory of situated learning (Lave & Wenger, 1991; Wenger, 1998) is a social learning theory that posits that the experiential processes involved with IPE implementation are situational and localized. William Hanks (1991) states that *situated learning* signifies "the relationship between learning and the social situations in which it occurs" (p. 14). The situational context occurs through an apprenticeship model—where novices become experts via legitimate peripheral participation. Hence, IPE involves facilitation by faculty experts, whereby students (novices) learn, collaborate, and reflect together within the real-world context of clinical practice. This participation within an interactive community allows the students to develop shared interprofessional knowledge and skills. Further, this participation undermines the classifications and distinguishable identities which students of distinct HASC professions construct. In so doing, the students interact through interprofessional socialization (Khalili et al. 2013), through which they construct a dual professional-interprofessional identity, to which they all belong (Maddux et al., 1997). Ultimately, the

students form a community of practice, whereby they “share case management and provide better health services to patients and the community. The resulting strengthened HASC delivery system leads to improved health outcomes” (World Health Organization, 2010, p. 10).

4.5.2 Generalized Professional Competencies Supporting Health and Social Care Professional Education

The final piece in our presentation of the theoretical framework for productive engaged learning for IPE comprises professional competencies. Professional competencies are “disciplinary-specific knowledge, skills, and dispositions associated with effective professional practice” (Brantley-Dias et al., 2021, p. 191). Most, if not all, regulated professions are characterised and identified either implicitly or explicitly by their expected set of competencies. This is no different for HASC professions. Additionally, professional competencies guide many professional education programmatic curricula and student graduation outcomes. HASC professional education programs, like many other professional programs, are increasingly becoming competency-oriented, where knowledge, skills, and dispositions associated with the profession are expected to be developed and refined over a continuum that arcs over both the professional education program and professional practice (Brantley-Dias et al., 2021). Earlier, we highlighted that the more behaviourist-oriented educative practices of the past have given way to constructivist-oriented practices that incorporate and emphasize the sociocultural milieu of both the HASC practitioners and their patients/clients. That is, HASC professional educative practices are moving away from the more task and outcomes-oriented practices where the locus of control was with the instructor (narrow task/behavioral perspective) toward more collaborative and real-world-oriented practices where learning is diffused among the learners and the instructor, and where broad standards are used to facilitate learners to have agency for their own learning and to support

the development of competencies needed for their professional practice (broad attribute perspective). Indeed, a cursory examination of the various HASC standards reveals competency-oriented outcomes that focus on the development of appropriate professional and disciplinary specific knowledge, skills, and dispositions; e.g., the Canadian Interprofessional Health Collaborative (CIHC)'s National Interprofessional Competency Framework (2010) and possibly other HASC professional education standards. For instance, each of the framework's six competency domains (interprofessional communication, patient/client/family/community-centred care, role clarification, team functioning, collaborative leadership, and interprofessional conflict resolution), which describe desired outcomes, is constituted of, and integrates knowledge, skills, and dispositions; e.g., attitudes, values, and judgements (CIHC, 2010). While we know that the overarching goal of HASC professional education programs is the development of professional knowledge, skills, and dispositions, it needs to be emphasized that successful professional practice requires well-developed competencies in each of knowledge, skills, and dispositions. For professional practice, knowledge, skills, and dispositions are not discrete entities, but are complementary, yet cohesive and inseparable. Thus, for example, having only two of the three competencies well-developed is insufficient for successful professional practice. Simply, one must *know* the practice (knowledge—what resides in the mind but manifested in the real world in some observable form), be *able to* practice (skills—evidenced ability to do in the real world), and have the appropriate *temperament* to practice (dispositions—having a pattern of behavior driven by morals, values, ethics, etc., that is directed to a broad goal).

4.6 Conclusion

The call for the implementation of IPE initiatives in HASC professional education dates to the 1960s (McCreary, 1964; Szasz, 1969)—a consequence, in part, of Flexner's (1910) recommendations. Almost 60 years since the initial call for IPE—and more than 100 years after

the Flexner report—significant progress has been made in recognizing, understanding, and appreciating the value of constructivist-oriented curriculum theory and learning theory in HASC professional education and, more specifically, in IPE. Realizing the dearth of intentional theory amalgamation in IPE practices, this paper integrated epistemology, theory, and professional competencies (knowledge, skills, and dispositions) to propose a theoretical framework for productive engaged learning for IPE. The understanding, application, and presentation of philosophical and theoretical assumptions of IPE and IPCP research increases the validity, trustworthiness, and the stability of the research process and findings. In essence, a theoretical framework, such as the one presented here, provides firm foundation for conducting and communicating IPE and IPCP research. As we have done in this article, IPE practitioners and researchers are invited to apply Dillon's questioning of curriculum's nature, elements, and practice (Dillon, 2009) and leverage current theoretical understandings about interprofessional learning to guide their initiatives, improve the evaluation of intended student learning outcomes, and stimulate more sustainable IPE delivery. This has the potential to then lead to student proficiency in interprofessional competencies, establishment of professional communities of practice, and eventual improvement of patient/client-oriented outcomes.

Chapter 5

5 A Comparative Analysis of Integrated Interprofessional Education Curriculum Models at Four Canadian Post-Secondary Institutions

5.1 Abstract

In health and social care (HASC) professional education, interprofessional competencies are optimally developed by engaging in interprofessional education (IPE) activities that are delivered sustainably along a continuum. Ultimately, active engagement in IPE is meant to prepare future practitioners for interprofessional collaborative practice (IPCP), which leads to improved patient/client and community-oriented outcomes. This qualitative case study explored how four Canadian post-secondary institutions deliver IPE within their HASC professional education programmatic structures. Data were collected from institutional websites, publicly available IPE-relevant records and documents, and interviews with coordinators and faculty/facilitators of IPE curriculum. Data were inductively analyzed to generate relevant themes, followed by a deductive analysis guided by the five accreditation standards domains identified in the Accreditation of Interprofessional Health Education (AIPHE) project. Analyses of the data resulted in five attributes: (1) Central Administrative Unit; (2) Longitudinal and Integrate Program; (3) Theoretically Informed Curriculum Design; (4) Student-Centred Pedagogy; and (5) Patient/Client-Oriented Approach. Using these attributes and guided by AIPHE's accreditation standards domains, an organizational-curricular model for sustainable IPE is proposed, through which we assert that IPE reinforced through these organizational and curricular supports reflects successful programming, leading to patient/client-oriented outcomes.

5.2 Background

More than a century ago, the Flexner report (1910) recommended that medical schools in North America be reformed to ensure that their graduates are well trained for clinical practice. These reforms included requiring more comprehensive pre-medical education, establishing collaborative partnerships between education and practice settings, and engaging practitioners in both teaching and research. These recommendations, which were effectuated by medical and other health and social care (HASC) professional education programs, emphasized—perhaps indirectly—increased professionalization, through which members of one profession together formed a professional identity that is distinct from other HASC professions. This led to disconnected education and practice, through which students of diverse HASC professions graduated with minimal knowledge of other practitioners' roles and responsibilities.

Further, programs typically focused on the implementation of time-based models, where students completed their professional training for a pre-specified duration (e.g., undergraduate medical education is typically three or four years long). During this time, students were assessed and evaluated on their knowledge acquisition, but minimal emphasis was placed on assessing and evaluating students' translation of their acquired knowledge into practice (Thibault, 2013). Regrettably, this approach may have permitted some unqualified and underqualified students to graduate and enter the workplace (Frank et al., 2010), where they experienced difficulties providing patient/client-centred care. In response, the World Health Organization (WHO) has called for reforms of HASC professional education programs so that graduates of these programs are fit-for-practice, highlighting that traditional approaches to HASC professional education would not be able to address the evolving societal and patient population needs of the 21st century.

Consequently, accreditation and regulatory bodies of respective HASC professions required that post-secondary institutions provide adequate supports at both organizational and curricular levels so that students' competencies in problem-solving, decision-making, and effective communication and collaboration are demonstrated and evidenced in practice-based clinical settings (Frank et al., 2010; Gruppen et al., 2012). This approach places less emphasis on time-in-training and greater emphasis on individual learners' progression of competence to ensure that all graduates are prepared to effectively meet their patients'/clients' needs. In this modified approach, where professional competence in the field was prioritized, the curricular emphasis shifted to more student-centredness, and exhibited elements of social constructivism (Vygotsky, 1978), transformative learning (Mezirow, 1991), and adult learning theories (Knowles, 1968). Additionally, this enabled students to experientially develop their professional competencies along a novice to mastery continuum at their own pace and to recognize the importance of these competencies to their future patient/client-oriented provision of care and services (Frank et al., 2010; Gruppen et al., 2012).

Contemporary education programs in the HASC professions emphasize proficiency in several overarching competency domains as a requirement for graduation, licensure, and professional practice. In Canadian undergraduate medical education, for instance, the CanMEDS framework (Frank et al., 2015) specifies that graduating physicians are required to demonstrate proficiency in seven overarching competency domains: *Medical expert*; *Communicator*; *Collaborator*; *Leader*; *Health advocate*; *Scholar*; and *Professional*. While the majority of the competencies are profession-specific (e.g., *Medical expert*, *Leader*, *Health advocate*, *Scholar*, and *Professional*), a subset of these competencies involves interprofessional abilities (e.g., *Communicator and Collaborator*). The spirit of the CanMEDS framework is equivalently seen in other HASC professions; for example, in the Association of

Canadian Faculties of Dentistry's (ACFD) *Educational Framework for the Development of Competency in Dental Programs* (2016); the National Physiotherapy Advisory Group's (NPAG) *Competency Profile for Physiotherapists in Canada* (2017); the Federation of Dental Hygiene Regulators of Canada's (FDHRC) Entry-to-Practice Canadian Competencies for Dental Hygienists (2021); and the *Competencies for Occupational Therapists in Canada* (2021) collaboratively presented by the Association of Canadian Occupational Therapy Regulatory Organizations (ACOTRO), the Association of Canadian Occupational Therapy University Programs (ACOTUP), and the Canadian Association of Occupational Therapists (CAOT).

Interprofessional education (IPE) is defined by the Centre for the Advancement of Interprofessional Education (CAIPE) as "occasions when members or students of two or more professions learn with, from and about each other to improve collaboration and the quality of care and services" (2016, p. 1). The desired outcomes from learning *with*, *from*, and *about* each other are to emphasize a dedicated team-based approach to HASC whose members share the same patient/client-oriented goals and whose skills and abilities complement one another, rather than to protract the historical hierarchical and stereotypical roles of the HASC professions (Eichbaum, 2018; Gergerich et al., 2019). Ultimately, active engagement in IPE is meant to prepare graduating HASC professional students for interprofessional collaborative practice (IPCP), which in turn is believed to lead to improved patient/client and community-oriented outcomes (Gunaldo et al., 2021; Lee et al., 2021; Reeves et al., 2017; Vestergaard & Nørgaard, 2018; White-Williams et al., 2022).

According to the WHO's Fra*mework for Action on Interprofessional Education & Collaborative Practice* (2010) and the Canadian Interprofessional Health Collaborative's (CIHC) *National Interprofessional Competency Framework* (2010), IPE-induced and effective IPCP requires that novice HASC practitioners develop proficiencies in six interprofessional competency domains: *interprofessional communication*; *patient/client-centred care*; *role*

clarification; *team functioning*; *interprofessional conflict resolution*; and *collaborative leadership*. The development of capabilities in these domains is a complex task that requires systematic, purposeful, and collaborative efforts by post-secondary institutions, the HASC professional education programs, and the faculty affiliated with these programs (D'Amour & Oandasan, 2005).

According to the Accreditation of Interprofessional Health Education (AIPHE) project (2010, 2011) and the Health Professions Accreditors Collaborative (2019), IPE must be *sustainably* developed, implemented, and evaluated along a continuum. This involves addressing all five accreditation standards domains (Table 5) and thereby enabling students to effectively develop and translate their interprofessional capabilities over time and into practice (Lawn, 2016; Maneval et al., 2019; Zipp et al. 2021).

Table 5 *The Accreditation Standards Domains Identified in the Accreditation of Interprofessional Health Education Project (2010, 2011)*

Domain	Description
Organizational commitment	Organizational commitment refers to those administrative structures and processes, preferably at the level of the Vice President's Office and/or deanship, that must foster the development, implementation, and evaluation of IPE.
Faculty	Faculty members must be supported, encouraged, and prepared to facilitate the development, implementation, and evaluation of IPE.
Students	Students must understand the significance of IPE and demonstrate proficiency in interprofessional competencies.
Educational program	Educational programs within and across faculties must share a common understanding of IPE and facilitate the development, implementation, and evaluation of IPE throughout the learning continuum for all students.
Resources	The human, material, and financial resources that enable the development, implementation, and evaluation of IPE must be supplied.

Notes: IPE, interprofessional education. Adapted with permission from (Azzam et al., 2021).

Regrettably, Gilbert et al. (2022) recently showed that although the majority of Canadian post-secondary institutions deliver IPE, most of them implement IPE either through infrequent, non-mandatory opportunities within their curriculum or through optional, extra-curricular opportunities. Further, most institutions inadequately address key organizational and curricular attributes that facilitate effective IPE, including dedicated organizational support, provision of adequate resources, and multi-tiered relationships among post-secondary institutions, clinical environments, and patient/client partners. Comparable studies

in other countries have indicated similar findings; Bogossian et al. (2022) and Boshoff et al.'s (2020) reviews of IPE implementation components, outcomes, challenges, and lessons learned imply that often current IPE opportunities are not delivered sustainably, thus questioning the ability to ensure that all students graduate with interprofessional skills. Additionally, there is minimal research showing evidence-based delivery of IPE that is both student-centred and patient/client-oriented (Bogossian et al., 2022; Boshoff et al., 2020; Gilbert et al., 2022).

5.2.1 The Present Study

Identifying attributes that reflect successful IPE programming through which IPCP can be sustained over time and into practice may provide insight to curriculum developers when making their respective IPE opportunities more sustainable. As such, this study explored how Canadian post-secondary institutions address the five accreditation standards domains (AIPHE, 2010, 2011) and sustainably deliver IPE by embedding interprofessional opportunities within their HASC professional education programmatic structures and curricula. The study aimed to answer the research question, *What are the organizational and curricular attributes of interprofessional education delivery at four Canadian post-secondary institutions with sustainable IPE programs?*

5.3 Methods

This qualitative case study (Yin, 2018) explored how IPE (the phenomenon) is currently delivered at four Canadian post-secondary institutions self-identified as providing sustainable IPE program for the prelicensure HASC professional students. Data were collected from (1) institutional websites, (2) IPE-relevant records and documents that are publicly available through electronic databases, and (3) interviews with institution IPE leads and/or

coordinators and (4) interviews with faculty/facilitators of their respective institution's IPE curriculum. Data were analyzed using both inductive and deductive techniques.

5.3.1 Participating Institutions

All eight public Canadian institutions (including teaching hospitals), whose faculty leaders involved with IPE serve on CIHC committees, were invited to participate in this study at a CIHC Board Meeting. To be eligible to participate, institutions must have implemented IPE using a longitudinal approach, rather than through sporadic events. The institutions that agreed to participate are the University of British Columbia (UBC), University of Manitoba (UofM), University of Toronto (UofT), and Université de Montréal (UdeM). Collectively, more than 4,700 students in the same year level enrolled in 21 diverse HASC professional education programs (see Appendix 7) actively engage in the IPE opportunities offered at these four institutions. One-third of these professions (*n* = 7; dentistry, medicine, nursing, occupational therapy, pharmacy, physical therapy, and social work) were represented at all four institutions, with their students annually representing approximately 85% of all participants in the IPE curriculum.

5.3.2 Data Collection and Analysis

Data were collected between April and September 2022 from three sources—allowing for triangulation and rigorous, multi-informant evaluation of the findings (Patton, 2015). First, authors MA and AP studied the official websites of these institutions and IPE-relevant records and documents. This included examining policy documents, curriculum reports, and published peer-reviewed articles that are publicly available through electronic databases (see Appendix 8). This initial abstraction and analysis of these sources were completed to gain an overall understanding of how IPE programming is implemented at these institutions and to confirm whether that programming does indeed reflect a longitudinal

approach. Second, MBA conducted online, semi-structured, individual interviews (*n* = 4; lasting between 30 and 45 minutes; see Appendix 9 for interview guide) using Zoom Web Conferencing (Zoom Video Communications, Inc., 2011) with the coordinators of their respective office/centre for IPE (Table 6) to attain more accurate descriptions of how IPE opportunities are designed and evaluated, and how they are embedded into existing programmatic structures and curricula. These coordinators and other program leads (authors DD, MF, SL, LM, and MCV) are members of the CIHC and served as participant-researchers by co-authoring this paper and validating its contents. Third, MBA also conducted online, semi-structured, individual interviews (*n* = 7 including two from UBC, UofM, and UofT and one from UdeM; each lasting between 30 and 70 minutes) using Zoom Web Conferencing with faculty/facilitators of these IPE opportunities to attain further insights of the contexts, conditions, and implementation of IPE. Faculty participants must have had at least three years of experience facilitating IPE in the classroom and/or practice setting. Faculty were asked about their experiences with the IPE curriculum, including enablers, barriers/challenges, implications, and outcomes. All interviews were recorded and transcribed verbatim. Interview data were verified by the participants by member-checking their interview transcripts (Creswell & Creswell, 2018). MA and AP inductively analyzed the data (Bowen, 2009; Hsieh & Shannon, 2005) to generate relevant themes (Saldaña, 2021), and further deductively analyzed the data through the AIPHE project's (2010, 2011) five accreditation standards domains to reveal the extent to which IPE delivery at these institutions is addressed across these domains (see Table 5). Consensus on these analyses was reached during subsequent meetings with all co-authors. The identities of the facilitator interviewees have been anonymized through use of pseudonyms.

Table 6 *Offices/Centres for Interprofessional Education at Participating Institutions*

Institution	Office/Centre for Interprofessional Education
University of British Columbia	University of British Columbia (UBC) Health
University of Manitoba	Office of Interprofessional Collaboration (OIPC)
University of Toronto	Centre for Advancing Collaborative Healthcare and Education (CACHE)
Université de Montréal	Interfaculty Operational Committee (CIO-UM) and Office of Collaboration and Patient Partnership (DCPP)

Notes: CACHE was previously known as the Centre for Interprofessional Education (CIPE).

5.4 Results and Discussion

This case study's findings come from the analysis of the institutional websites and publicly available IPE-relevant records and documents and interviews of IPE office/centre coordinators (*n* = 4) and IPE facilitators (*n* = 8). We inductively analyzed the collected data to generate five common themes across all four institutions. We further arranged the inductive themes into two attributes (organizational and curricular) to make assertions (Saldaña, 2021) about the delivery of IPE at these post-secondary institutions (Figure 11). We report and discuss the deductive analyses and implications within each of the inductively generated themes.

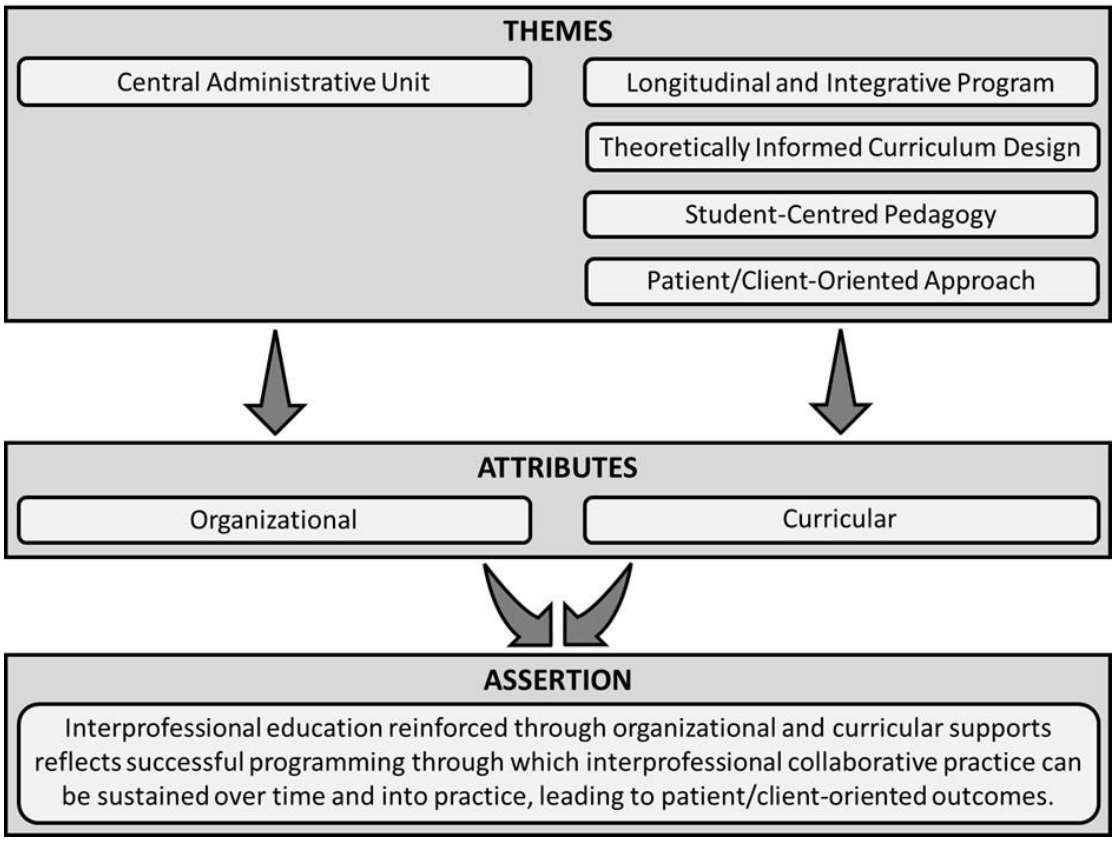

Figure 11 *Coding Scheme Highlighting our Inductive Themes, Attributes, and Assertion*

5.4.1 Central Administrative Unit

Central Administrative Unit emerged as an organizational attribute from our analysis of the data across all four institutions. This theme aligns well with the *Organizational Commitment*, *Faculty*, and *Resources* domains found in AIPHE (2010, 2011) and corresponds with the Black et al.'s (2022) emphasis on sustaining IPE programming through institutional infrastructure. The four institutions have established centralized administrative units (see Table 6) that coordinate the interfaculty/inter-collegiate and inter-program relationships, allocation of adequate human, material, and financial resources, delivery of distinct IPE opportunities, and provision of technical support—all of which are necessary for sustainable IPE development, implementation, and evaluation (AIPHE, 2010, 2011; D'Amour & Oandasan, 2005; Grymonpre et al., 2016a; Gunaldo et al., 2022).

These centralized administrative units are also responsible for leading professional development courses/programs, each lasting between a couple hours and a few days. At UofT, for instance, the Educating Health Professionals in Interprofessional Care (ehpic™) program, among other faculty professional development opportunities, is an annual four-day program through which faculty are trained to teach methods of effective team communication, define and overcome challenges during IPE sessions (e.g., poor student engagement and disruptions), and develop and effectively facilitate conceptually focused IPE sessions that stimulate productive discussions. Further, these centralized administrative units organize and hold topic-specific professional development workshops for their faculty to prepare them to facilitate prospective IPE opportunities, where each workshop is focused on a specific interprofessional concept/topic. During a typical workshop, “They'll go through the agenda. They'll go through what the objectives are and what we're hoping the students come away with. So, I think those are really helpful” [Mariam, UofT facilitator].

Further, a mechanism for formalized communication (e.g., the Interfaculty Curriculum Committee at UofT or the Health Professions Education Steering Committee at the UofM), external to the IPE office/centre, further facilitates the curriculum by enabling agreement on similar approaches across faculties/colleges/programs. Such a committee may include IPE facilitators and preceptors from all participating professions, in addition to representatives of student associations, the Faculty of Education, and patient/client partner groups, where these groups actively engage with faculty in curricular content-making, delivery, evaluation, and scholarship. For instance, students at UofT are appointed by the Interprofessional Healthcare Student Association to engage with decision-making alongside faculty as voting members of the Interfaculty Curriculum Committee. Similarly, student representatives in the Interfaculty Operational Committee and the Interprofessional Student Council at UdeM are regularly consulted to inform IPE curriculum evaluation and continuous quality improvement.

5.4.2 Longitudinal and Integrative Program

Longitudinal and Integrative Program was the first curricular attribute (and second emergent theme) from the analysis of the data. At the four participating institutions, IPE opportunities commence in the Fall (first) academic term of the first year and are integrated throughout much of or the entire duration of participating HASC professional education programs. At UBC, UofM, and UofT, these opportunities span over two years; at UdeM, these opportunities are implemented over three years. This longitudinal approach enables students to develop their capabilities of interprofessional competencies along a continuum and over time, enabling them to effectively practice and demonstrate their competency in further placements and later in the clinical workplace (Lawn, 2016).

Further, IPE opportunities are either incorporated into the curriculum as components of existing programmatic coursework (at UBC, UofM, and UofT) or as individual courses and internships/practicum placements (at UdeM). Through this integrative approach, IPE activities are infused within the curriculum, leading to professional enculturation (Maneval et al., 2019; Zipp et al., 2021). Further, the four institutions realize the fact that IPE should be offered as both mandatory and elective components. That was demonstrated in the facilitators' interviews.

> I think if the belief is that this is a key skill, […] it has to be mandatory. A certain level of it has to be required, otherwise you're communicating that, "This is non-essential." "It's an add-on." "It's a 'nice to have,' not 'a need to have'." So, I think there has to be a certain agreed upon proportion of teaching that is mandatory, and that everybody must do to an adequate level. But I think there is room to have elective opportunities where folks can go deeper. [Amelia, UofM facilitator]

> Electives? Students really like the electives. As a student, what a great opportunity to think about— "Do I love pediatrics?" "Am I really passionate about stroke care?" To have it so student-centred like that— I think it's a strength. … Sometimes, students are like, "Wow, I want to learn about this," and so they go above and beyond. So, I do think that electives have a place. … We have electives at our practice settings, and that's a huge thing. I think to be learning additional things when they're on placement is a really valuable opportunity. [Benjamin, UofT facilitator]

5.4.3 Theoretically Informed Curriculum Design

The second curricular attribute (and third emergent theme) present within the participating institutions was *Theoretically Informed Curriculum Design*. The interprofessional competency domains (CIHC, 2010; WHO, 2010, 2022) are systematically integrated into IPE activities, which are also considered within the context of profession-specific competencies. For medicine, for instance, the *interprofessional communication*, *team functioning*, and *collaborative leadership* domains are aligned with and considered within the *Collaborator* and *Communicator* roles identified in the CanMEDS framework (Frank et al., 2015). Further, the IPE opportunities are created using the guiding principles of several social constructivist learning theories and conceptual frameworks (Table 7). The social constructivist approach, through which these theoretical and conceptual frameworks were developed, acknowledges that students begin their educational training with varying degrees of experience and construct their learning differently (Lawn, 2016). Hence, this lens enables curriculum developers to design and implement opportunities for students to "learn with, from and about each other" (CAIPE, 2016, p. 1), where "they recognize that there's actually a lot of overlap in scope. So, people don't have to feel so territorial, but recognize that there are other people to help them" [Lucy, UBC facilitator]. In so doing, students expand their IPCP-oriented habits of mind through adaptive expertise—enabling them to "realize that by working together, their

lives will be easier, and their patients' outcomes will be better," [Lucy] leading to eventual formation of patient/client-oriented communities of practice (Hean et al., 2018).

Table 7 *Theoretical Foundations and Conceptual Frameworks Used*

Theoretical Foundations
Social constructivism (Vygotsky, 1978)
Transformative learning (Mezirow, 1991)
Adult learning theory (Knowles, 1968)
Contact theory (Allport, 1954)
Pragmatic complexity theory (Long et al., 2018)
NCCIH's Framework for Structural Competency (Metzl & Hansen, 2014)
Conceptual Frameworks
Framework for Action (WHO, 2010)
National Interprofessional Competency Framework (CIHC, 2010)
IECPCP (D'Amour & Oandasan, 2005)
Kirkpatrick's Model for Program Evaluation (1967), as adapted by Barr et al. (2000)
Competency Framework for Collaborative Practice and Patient Partnership in Health and Social Services (CIO-UM & DCPP, 2016, 2019)
Relationship-Centred Care Framework (Beach et al., 2006)
Population Health Promotion Framework (Hamilton & Bhatti, 1996)
Framework for Interprofessional Leadership (Drinka & Clark, 2016)
NCCIH's Framework for Anti-Racism (Greenwood, 2019)
Patient Safety Competencies (Canadian Patient Safety Institute, 2020)
Framework for Structured Reflection (Driscoll, 1994)

Notes: CIHC, Canadian Interprofessional Health Collaborative; CIO-UM, Interfaculty Operational Committee; DCPP, Office of Collaboration and Patient Partnership; IECPCP, Interprofessional Education for Collaborative Patient-Centred Practice; NCCIH, National Collaborating Centre for Indigenous Health; WHO, World Health Organization.

The IPE opportunities comprised of a series of structured, interactive IPE encompassing both classroom- and practice-based components. Whereas classroom-based IPE introduces students to interprofessional learning and immerses them in interprofessional discussions and simulations, practice-based IPE enables students to apply their interprofessional learning in "dedicated interprofessional team-based placements providing planned interprofessional interventions with [patients/clients]" (Barr & Brewer, 2012, p. 199). Classroom-based experiences are typically implemented earlier in the programmatic structure at these institutions, with practice-based components being offered subsequently. For instance, students in two-year programs (e.g., occupational therapy and physical therapy) may engage in this practice-based stage earlier than students in four-year programs (e.g., medicine and pharmacy). When asked about students' readiness for IPCP upon completing their classroom-based IPE, one facilitator stated that "I don't feel that most students [are] fully ready to collaborate. I think, often, that is something that they learn once they are in clinical practice" [Violet, UofM facilitator]. This cohesion between classroom and practice-based settings at these institutions indicates how important it is for the participating programs to implement IPE along an increasingly authentic/real-life continuum, which is emphasized under AIPHE's (2010, 2011) *Educational Program* domain and whereby both settings inform one another and formulate a common pedagogical understanding of how IPE should be implemented despite the different classroom and practice-based contexts. One facilitator stated that,

> They're being exposed to [IPE in the classroom], but if you don't do it [in practice]—So, the students that do field work and have the IPE matched with the field work, that is game changer stuff. But if we're just dabbling in it in courses and students don't apply it, it gets lost. [Amelia, UofM facilitator]

Moreover, the theoretical foundations that underpin IPE design and implementation are also linked to subsequent, robust programmatic evaluation methods, which are informed by Kirkpatrick's Model for Program Evaluation (Kirkpatrick, 1967), as adapted by Barr et al. (2000). This logical theoretical linkage between *what is designed* and *what is evaluated* is indicative of well-defined intended learning outcomes (Hean et al., 2018) and is also required to defend the efforts and resources expended on creating and sustaining the IPE curriculum. All four institutions collect input from their students and educators (including facilitators, program leads, and patient/client partners, wherever applicable) regarding the curriculum through a variety of methods, including course/year-end surveys, focus groups, and interviews. In addition, students at UofM complete pre-post-post surveys (before Year 1; after Year 1; after Year 2; see Fricke et al., 2019; Grymonpre et al., 2016b; MacDonald et al., 2018; Office of Interprofessional Collaboration, 2022; using, for instance, the Interprofessional Socialization and Valuing Scale [ISVS]; King et al., 2016). Longitudinal interprofessional student teams also self-assess their collaboration at every in-person meeting (four in total over two years) using a modified, team-based Interprofessional Collaborator Assessment Rubric (ICAR) (Curran et al., 2011). Lastly, UofT conducts realist evaluations of their curriculum (e.g., Raveendrakumar et al., 2021) and has students evaluate each core and elective IPE activity (e.g., Raveendrakumar et al., 2021; Dale et al., 2022). Other methods that inform programmatic evaluation include unsolicited practice stories from alumni who experienced the curriculum and external reviews of their respective offices/centres for IPE.

5.4.4 Student-Centred Pedagogy

The third curricular attribute (and fourth emergent theme) from the analysis of the data from all participating institutions was the presence of *Student-Centred Pedagogy* (see Appendices 10, 11, and 12 for detailed descriptions and examples). This theme aligns well with the *Students* domain identified through AIPHE (2010, 2011). The classroom-based and

practice-based components of the examined curriculum models are pedagogically developed to enable students to *first* explore their profession and attain appreciation for IPCP. At UofM, for instance, first-year learning teams explore *team functioning*, *interprofessional communication*, and *community-centred care* in the context of population health; second-year students build on their first-year exposure and explore their *roles and responsibilities*, *shared leadership*, and *interprofessional conflict resolution* within the context of patient/client safety. Similarly, the *Collaboration in Health Sciences I* course at UdeM focuses on discovering other HASC professions and the concepts of patient/client partnerships. *Second*, students continually and progressively develop competency in the six interprofessional competency domains (CIHC, 2010; WHO, 2010). At UofT, for instance, the *Inter-Faculty Pain Curriculum* (see Cioffi et al., 2021; Trouvin, 2022) is a 20-hour, three-day interprofessional symposium that incorporates small interprofessional group discussions and development of interprofessional pain assessment and management plans. *Third*, students apply their knowledge and skills in practical simulation-based and case-based learning activities. At UBC, for instance, students who participate in the iEthics curriculum (Wood et al., 2022) and the *Interprofessional Rural Program of British Columbia* (IRPbc) program are grouped into interprofessional teams and live and learn together in rural communities away from home.

This scaffolding of IPE opportunities leads to the direct student-centred outcomes described in the modified Kirkpatrick Model for Program Evaluation (Freeth et al., 2002). This model stresses using broad-ranging experiential and situated learning techniques in the form of interactive, small group, problem-based activities and challenging student groups with progressively complex tasks with real-world applications, upon which they can reflect and expand their interprofessional knowledge, skills, and dispositions towards IPCP (D'Eon, 2005; Reeves et al., 2015). In so doing, this approach employs adult learning theory (Knowles, 1968), contact theory (Allport, 1954), pragmatic complexity theory (Long et al., 2018), and

transformative learning (Mezirow, 1991). Further, note that these opportunities are not meant to be the only interprofessional learning opportunities to which HASC professional students are exposed. Other opportunities above and beyond these curriculum models are usually implemented through collaborative efforts between/among the HASC professional education programs (see Appendix 13).

Additionally, the four institutions utilize a multitude of formative and summative assessment methods. For instance, students at UofM are graded for their participation (e.g., frequency, length, and quality of posts) in all online discussions. Further, during the IPE workshops concluding the second and third courses at UdeM, IPE competencies manifested by the students are observed and graded using an assessment grid by two co-facilitators (a HASC professional and a patient/client partner). At UBC, UofM, and UofT, students are required to submit written reflections regarding their interprofessional competency development, e.g., in response to guiding questions based on Driscoll's *What? So what? Now what?* model of reflection (Driscoll, 2007). According to one facilitator,

> Students need to document and self-reflect, and they're graded on these self-reflections. … I think the active self-reflection is something that is of value for them, because at least it brings the subject to the forefront in their mind rather than something that is just background knowledge. [Isabella, UBC facilitator]

Similarly, students at UdeM individually complete the Interprofessional Collaborative Competencies Attainment Survey (ICCAS; Archibald et al., 2014) to assess their interprofessional competency development towards the end of each of the three courses. Lastly, students at UofT complete and are given feedback on the modified ICAR (Hayward et al., 2014) and the Interprofessional Collaborator Assessment (IPCA; Langlois et al., 2017), following completion of the three-day Interfaculty Pain Curriculum and their practice-based IPE activities, respectively.

Lastly, all aspects of student-centred pedagogy described above facilitate the creation of a psychologically safe environment for the students. *Psychological safety*[7] has been recognized to be one of the most important factors for effective teamwork (Lackie et al., 2022). More specifically within the context of IPE, psychologically safe environments are crucial to facilitating richer student participation and proficiency in interprofessional competency domains (CIHC, 2010) by diminishing the negative effects of power dynamics and hierarchical and stereotypical structures that are historically predominant in the HASC professional culture (Appelbaum et al., 2020; Newman et al., 2017; Roussin et al., 2018). The four curriculum models described exhibit features that promote a culture that enhances psychological safety. For example, at UofM, the synchronous virtual learning activities focus on enabling the interprofessional teams to enhance team communication and function to dismantle all forms of discrimination and racism. Although these examples are provided in Canadian contexts, these approaches can be transferred to other contexts where global health and cultural safety are of relevance to, for example, newcomer and refugee populations and other marginalized and/or racialized groups.

5.4.5 Patient/Client-Oriented Approach

The fourth curricular attribute (and fifth and last emergent theme) from the analysis of the data was the emphasis of a *Patient/Client-Oriented Approach*, which was exhibited at all four institutions. The curricular approaches described above collectively enable students to eventually form a community of practice (Lave & Wenger, 1991; Wenger, 1998), leading to improved patient/client-centred outcomes that can be sustained over time and into practice (Grymonpre et al., 2016b; Khalili et al., 2013). The formation of these communities of practice

[7] According to Edmondson (2019), a team demonstrates *psychological safety* when team members "feel comfortable sharing concerns and mistakes without fear of embarrassment or retribution. They are confident that they can speak up and won't be humiliated, ignored, or blamed. They know they can ask questions when they are unsure about something. They tend to trust and respect their colleagues."

are typically situated within the cultural identities of the local communities. For instance, UofM offers Indigenous, community-led IPE immersion programs (e.g., Mendez et al., 2021), guided by the National *Collaborating Centre* for Indigenous Health's (NCCIH) Framework for Anti-Racism (Greenwood, 2019), including "Home for the Summer" and *Ndinawemaaganag ("*All My Relations" in the Anishinaabemowin language).

Further, the examined institutions stress the importance of having patients/clients and their families involved as *essential* partners (see Abelson et al., 2022; Descôteaux et al., 2020; Langlois & Mehra, 2020; Raynault et al., 2021; Sehlbach & Rowland, 2022), who are deemed valuable members of the interprofessional team, where they engage in the diagnosis, treatment, and management of their own and/or their loved ones' disease and/or illness. Madeline, a facilitator from UdeM, stated that,

> I think having patient partners is a wonderful thing that has been integrated in the curriculum. When I was a student, we often had that paternal view of 'We know what's best for the patients.' Now, we know that the patients will not improve if they do not understand why they're doing the things we're asking them to do. With this integrated approach, the patient benefits because they are part of the treatment plan and are at the center of our decision-making.

This approach to HASC delivery centralizes the patient/client as the subject of attention (Gilbert, 2008a), whereby their voices are heard, and their preferences and needs are acknowledged. In this manner, patients/clients are "seen as experts in their own lived experiences" (CIHC, 2010, p. 13), whereby their experiential knowledge gained from living with a condition, disease, and/or illness is recognized to complement HASC practitioners' scientific knowledge and skills (Brault et al., 2016; Karazivan et al., 2015; Pomey et al., 2015; Raynault et al., 2021). For these reasons, HASC professional education curriculum developers

and HASC practitioners are required to provide patients/clients with the knowledge, skills, and resources that enable them to retain control over the care and services they receive.

5.4.6 Assertion: An Organizational-Curricular Model for Sustainable Interprofessional Education

The five common attributes showcased in this study are evidenced to address aspects spanning across the five accreditation standards domains identified by the AIPHE project (2010, 2011). In so doing, we assert that these attributes together reflect successful IPE programming through which IPCP can be sustained over time and into practice, leading to patient/client-oriented outcomes (Grymonpre et al., 2016b; Khalili et al., 2013). That being said, curriculum developers are encouraged not to equate these attributes with AIPHE's domains for they are distinct. Whereas AIPHE's domains delineate guiding principles for successful IPE programming, the attributes identified herein can be thought of as an enactment of those principles. For instance, developing a common philosophy for IPE delivery across *Educational programs* requires *Organizational Commitment* and can be enacted through the implementation of a *Longitudinal and Integrative Program* that exhibits a *Theoretically Informed Curriculum* and *Student-Centred Pedagogy*. This approach can purposely enable *Faculty* to successfully facilitate IPE and empower *Students* to develop their interprofessional competencies.

Further, the HASC professions at most post-secondary institutions are typically housed in several different faculties/colleges, and therefore each faculty/college is presided over by a dean. *Organizational Commitment* refers to support for the development, implementation, and evaluation of IPE by the deanship; however, it does not dictate the establishment of a centralized administrative unit that both serves as a platform for interfaculty/inter-collegiate relationships and sustainably coordinates the delivery and management of *Resources* and the curricular attributes that support *Educational programs*,

Faculty development, *Student*-centred learning. As such, it is this centralized administrative unit that forms the foundational base for all other attributes that together lead to successful IPE programming. As such, we propose a model leading to sustainable IPE that manifests the enactment of AIPHE's domains through the organizational and curricular attributes reflected in our findings (Figure 12).

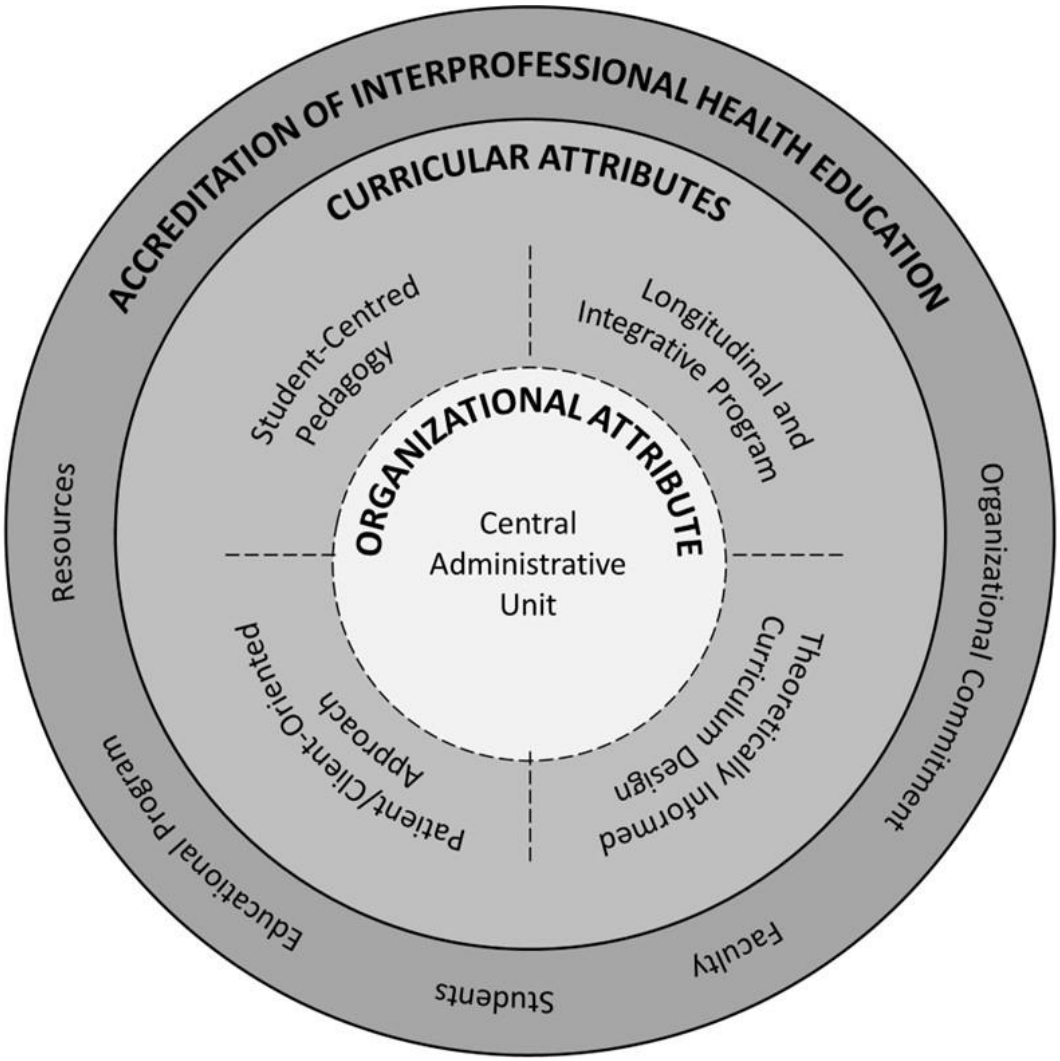

Figure 12 *An Organizational-Curricular Model for Sustainable Interprofessional Education*

5.4.7 Limitations

There are several limitations to this study. First, we used a convenience sample of participating institutions whose program leads are CIHC members and who have inherent

biases towards centralized structures. Second, no students were interviewed as part of this study, leading to potential misrepresentation of the student populations' perspectives regarding their curriculum. Lastly, the program evaluation methods at each of the four participating institutions may have their own biased results in terms of sample selection, student response rates, and data interpretation.

5.5 Conclusion

In this study, our exploration of how Canadian post-secondary institutions deliver IPE within their HASC professional education programmatic structures and curricula resulted in the identification of organizational and curricular attributes that together reflect successful IPE programming through which IPCP can be sustained over time and into practice. Establishing central IPE-specific offices/centres, integrating mandatory IPE within the curriculum, employing theoretical and conceptual frameworks, providing community-based and real-world (practice-based) IPE opportunities, and partnering with patient/client groups are all examples of how students' experiences with IPE can be augmented. Our findings are similar to those of Shrader et al.'s recently published mixed methods survey study, which examined organizational structures of IPE programs in the United States (Shrader et al., 2022). Future research examining the efficacy of one or more of these attributes is warranted, particularly from the perspectives of relevant stakeholders including faculty/facilitators, students, and recently graduated novice practitioners.

The five identified attributes evidenced in our data are also supported by the research literature as being essential for delivering sustainable IPE and attaining improved patient/client-oriented outcomes (Grymonpre et al., 2016b; Khalili et al., 2013). Further, these attributes complement the accreditation standards domains identified in the AIPHE project (2010, 2011) and can be thought of as an enactment of those guiding principles, where the attributes provide a foundation for both student-centred and patient/client-oriented learning.

As such, curriculum developers in HASC professional education programs are encouraged to use our proposed organizational-curricular model to assess their respective IPE programming and create more sustainable IPE curriculum. These common attributes—exhibited at the four participating institutions—might also be useful in HASC professional education programs that are trying to establish more robust IPE programming, especially in regions where IPE is still emerging.

Chapter 6

6 Facilitators and preceptors' experiences with integrated interprofessional education curriculum: A Canadian case study

6.1 Abstract

Changes in global health and social care (HASC) professional education systems are required to generate HASC workforces capable of interprofessional collaborative practice (IPCP) and enhancing patient/client-centred care. Effective IPCP can be generated through an integrated interprofessional education (IPE) curriculum, which involves using experiential and situated learning techniques to challenge students with progressively complex team-based learning opportunities with real-world applications upon which they can reflect and expand their interprofessional competencies. Despite a plethora of IPE literature, minimal research has evaluated the impacts of integrated IPE curricula leading to effective IPCP. This qualitative case study explored these impacts from the perspectives of classroom-based IPE facilitators and practice-based IPE preceptors in Canada. Data were collected through individual, semi-structured interviews with participants from four Canadian post-secondary institutions and deductively coded through thematic content analyses. Twenty-six facilitators and preceptors affiliated with one of twelve HASC professions were interviewed in this study. Our findings can be categorized into six main themes: (1) Gender Representation; (2) Availability of Facilitators and Preceptors; (3) Mode of Delivery; (4) Nature of Curriculum; (5) IPE Perceived as Extracurricular; and (6) Limited and Inequitable Practice-Based IPE. Participating institutions are recommended to provide substantial incentives to attract more faculty and clinicians to contribute to the IPE curriculum; implement IPE through both in-person activity-based sessions and virtual discussion-based sessions; establish inter-institutional partnerships that extend beyond the intra-institutional IPE curriculum; design for-credit and more comprehensive interprofessional learning opportunities; and equitably provide diverse

interprofessional learning to all students in primary care settings. By effectuating these recommendations, these institutions can have substantial influences on other IPE curriculum implementation programs in Canada and further reinforce Canada's global leadership in IPE and IPCP. Further, our findings reinforce the World Health Organization's efforts to promote sustainable integration of IPE in the programmatic structures of the HASC professional degree programs with aim to improve patient/client-centred care.

6.2 Background

Substantial research (e.g., Brandt et al., 2014; Cox et al., 2016; Grignon et al., 2013) demonstrates that improving patient/client-centred care and HASC delivery systems can be achieved through interprofessional collaborative practice (IPCP). According to the Canadian Interprofessional Health Collaborative (CIHC, 2010), effective IPCP requires that HASC practitioners be proficient in six interprofessional competency domains: interprofessional communication; patient/client-centred care; role clarification; team functioning; interprofessional conflict resolution; and collaborative leadership. Poor IPCP has been shown to adversely impact the provision of HASC (Reeves et al., 2017; Vestergaard & Nørgaard, 2018). Thus, approaches that address and enhance HASC practitioners' shortcomings in the six interprofessional competency domains have potential to lead to IPCP's intended patient/client-oriented outcomes. One approach that has been shown (e.g., Arenson et al., 2015; Cox & Naylor, 2013; Curran et al., 2010; Gunaldo et al., 2021; Reeves et al., 2015; Rotz et al., 2015; Ward et al., 2016) to lead to effective IPCP and its intended patient/client-oriented outcomes is that of an *integrated interprofessional education (IPE) curriculum*, which is characterized by four main elements.

First, the integrated IPE curriculum is typically comprised of a series of structured, interactive, interprofessional experiences encompassing both classroom-based and practice-based components. Whereas classroom-based IPE introduces students to interprofessional

learning and immerses them in interprofessional discussions, practice-based IPE enables students to apply their interprofessional learning in “dedicated interprofessional team-based placements providing planned interprofessional interventions with [patients]” (Barr & Brewer, 2012, p. 199).

Second, interprofessional opportunities through integrated IPE are dispersed throughout much of or the entire duration of participating health professional degree programs. Spanning over two or more years (depending on program duration), interprofessional opportunities can either be embedded into existing programmatic coursework or incorporated into programs as individual courses and internships/practicum placements.

Third, interprofessional opportunities through integrated IPE must be pedagogically effective to lead to direct student-centred outcomes, such as those described in the Kirkpatrick (1996) model adapted by Freeth et al. (2002). Like Vygotsky’s socio-constructivist principles (1978) and Verma et al.’s *acts of authentication* (2015), this model stresses using scaffolded experiential/situated learning in the form of interactive, small group, and problem-based activities and challenging student groups with progressively complex tasks and real-world applications upon which they can reflect and expand their interprofessional knowledge, skills, and dispositions (D’Eon, 2005).

Fourth, an integrated IPE curriculum model enables students to form a community of practice (Lave & Wenger, 1991; Wenger, 1998), leading to eventual improved patient/client-oriented outcomes that can be sustained over time and into practice (Grymonpre et al., 2010, 2016a, 2016b; Khalili et al., 2013). The intended patient/client-oriented outcomes of integrated IPE curriculum models and subsequent IPCP are that students form mutual trust and respect, develop proficiency in interprofessional competencies, and have shared

patient/client-oriented goals (Arenson et al., 2015; Curran et al., 2010; Lawn, 2016; McNaughton, 2018).

6.2.1 The Present Study

Incorporating team-based approaches in HASC professional education programs is meant to help prepare diverse HASC professional teams to effectively collaborate in primary care settings. Over the last two decades, a plethora of Canadian literature has demonstrated notable developments in the IPE and IPCP fields (e.g., Barr, 2005; Curran et al., 2005, 2006, 2010; D'Amour & Oandasan, 2005; Freeth, 2005; Gilbert, 2010; Grymonpre et al., 2010, 2016a, 2016b; Jones et al., 2015; Murphy et al., 2019; Reeves et al., 2010; Schmitt et al., 2013; Towle et al., 2016; Zwarenstein et al., 2005, 2009). Further, many post-secondary institutions in Canada implement integrated IPE curriculum in their programs. Nonetheless, very little research has examined the impacts of these models and whether these impacts are sustained over time and into practice (Lawn, 2016; McNaughton, 2018).

To begin to address these research gaps, this qualitative embedded single-case study (Yin, 2018), underpinned by the constructivist paradigm (Creswell & Creswell, 2018), explored the impacts of integrated IPE curriculum models on IPCP from the perspectives of classroom-based IPE facilitators and practice-based IPE preceptors at four Canadian post-secondary institutions. In so doing, this study addresses the following research question: *What are the health and social care academics and practitioners' experiences (e.g., enablers, barriers/challenges, implications, and outcomes) when delivering integrated interprofessional education curriculum?*

Addressing the research gaps associated with integrated IPE's impacts has been prioritized by the Global Confederation for Interprofessional Education and Collaborative Practice (Interprofessional.Global), which emphasizes "Developing evidence of [IPE and IPCP]

impact along the continuum from interprofessional education to collaborative practice in person- and community-centred service delivery" (Khalili et al., 2019, p. 15). Further, researchers, HASC leaders, and policymakers in countries where IPE and IPCP are still emerging, continue to look to Canada's global leadership in IPE and IPCP research, policymaking, and practice. More importantly, through this multi-institutional collaborative effort, the findings of this research will complement the promotion of IPE and IPCP by the WHO and the federal and provincial governments with aim to improve patient/client-centred care, motivate curriculum developers worldwide to integrate IPE in their programmatic structures, and inform potential revisions and updates to interprofessional-relevant standards by health professional accrediting organizations in Canada and elsewhere.

6.3 Methodology

This qualitative, embedded single-case study (Yin, 2018) explored the experiences of classroom-based IPE facilitators and practice-based IPE preceptors when delivering integrated IPE curriculum. Using individual, semi-structured interviews, data were collected from four Canadian post-secondary institutions: the University of British Columbia (UBC), University of Manitoba (UofM), University of Toronto (UofT), and Université de Montréal (UdeM). This study was approved by the Western University Non-Medical Research Ethics Board (#120360; see Appendix 14).

6.3.1 Theoretical and Conceptual Frameworks

This study is theoretically guided by the Framework for Productive Engaged Learning in the Professions (see Figure 10), which describes the interplay between the theories of experiential learning, social constructivism, and situated learning—leading to proficiency in interprofessional competencies (CIHC, 2010), establishment of communities of practice (Lave & Wenger, 1991; Wenger, 1998), and eventual improvement of HASC delivery systems through IPCP (Khalili et al., 2013). Further, this study is conceptually framed by Verma et al.'s

(2015) *acts of authentication.* In recent years, there has been a deliberate shift from rote knowledge acquisition and decontextualized skills development to more authentic, contextual, and situated learning experiences, where knowledge, skills, attitudes, and behaviors are developed in an inclusive and interconnected manner (Puvirajah et al., 2020). For example, underpinned by socio-constructivist/cultural and situated cognition theories, Verma et al. emphasize that meaningful learning experiences that work together to develop knowledge, skills, attitudes, and behaviors are *acts of authentication*. Acts of authentication are *in situ* learning experiences that incorporate productive disciplinary engagement (Engle & Conant, 2002), learner discourses, and work within a community of practice. Productive disciplinary engagement can be thought of as a progressive move towards substantive and involved learning experiences that underscore the knowledge, skills, attitudes, and behaviors of particular disciplines. Further, learner discourses and work within a community of practice not only support the learner in moving closer to productive disciplinary practices, but also cultivate certain norms of meaningful and authentic learning that can be extended to practices in academic, technical, and other work-related disciplines.

6.3.2 Defining the Case

Robert Yin (2018) defines a *case study* as "an empirical method that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (p. 50). Accordingly, the use of case study as a methodology for this study is suitable for three reasons. First, the case must be a phenomenon of interest; in this study, the explored social phenomenon pertains to how IPE is designed, implemented, and integrated in HASC professional education programmatic curricula. Second, the case must occur naturally in its real-life context and cannot be manipulated; the implementation of IPE occurs in its real-life context (the integrated IPE curriculum). Third, the case must be bounded within the contexts

of time, space, and activity; IPE is bounded by both classroom-based and practice-based components, whereby such activities are implemented at the four participating institutions at the time of this study.

6.3.3 Site Selection

Selecting the participating institutions was purposive in that these institutions had the necessary characteristics, including the implementation of integrated IPE curriculum that our research needed. Additionally, these four institutions all offer the seven largest HASC professions programs (dentistry, medicine, nursing, occupational therapy, pharmacy, physical therapy, and social work), from which participants were recruited. The four institutions also collectively represent a considerable proportion of HASC professional students in Canada (range: 700 to 1,600 students per institution; *N* = 4,700) and have significant influences on other IPE curriculum implementation programs in Canada and beyond. Further descriptions of these institutions' integrated IPE curriculum models can be found in Azzam et al. (In Press).

6.3.4 Participants

IPE facilitators and preceptors who were deemed most suitable for participation in this study were identified by their respective academic institutions' offices/centres for IPE (see Table 6). Participants had to meet three inclusion criteria: (1) must be affiliated with one of the prelicensure HASC professional degree programs at one of the four participating institutions; (2) must be comfortable participating in interviews using English; and (3) must have had a minimum of three years of experience facilitating interprofessional groups of learners in an integrated IPE curriculum. The three-year minimum criterion was necessary to exclude novice candidates who might be less knowledgeable of the definition and standards of IPE as well as less experienced in the strategies and challenges associated with IPE.

Twenty-six facilitators and preceptors affiliated with one of twelve HASC professions were interviewed for this study (Table 8). Approximately 77% of the participants were affiliated with one of the seven largest HASC professions programs at these institutions: dentistry (*n* = 2), medicine (*n* = 5), nursing (*n* = 2), occupational therapy (*n* = 3), pharmacy (*n* = 4), physical therapy (*n* = 3), and social work (*n* = 1). At the time of their interview, the participants had been HASC professionals for an average of 20 years (range: 5–46). Further, the participants had an average of eight years of experience facilitating IPE (range: 3–20), where approximately 58% (*n* = 15) of them facilitated classroom-based IPE, while 4% (*n* = 1) facilitated practice-based IPE and 38% (*n* = 10) facilitated IPE in both settings.

Table 8 *Participants' Demographics*

	Pseudonym	Gender	Primary Affiliation	Years in Profession	Role in IPE	Years in IPE
1	Aaliyah	Woman	Speech-language pathology	19	Classroom-based	7
2	Abigail	Woman	Dental Hygiene	28	Classroom-based	14
3	Amelia	Woman	Kinesiology	23	Classroom-based	15
4	Avery	Woman	Nursing	5	Classroom & Practice-based	4
5	Benjamin	Man	Physical Therapy	22	Classroom & Practice-based	8
6	Chloe	Woman	Medicine	20	Classroom-based	7
7	Darius	Man	Medicine	20	Classroom-based	3
8	Elizabeth	Woman	Dentistry	37	Classroom-based	15
9	Emily	Woman	Pharmacy	22	Classroom & Practice-based	4
10	Emma	Woman	Occupational Therapy	23	Classroom & Practice-based	5
11	Hannah	Woman	Pharmacy	46	Classroom-based	8
12	Isabella	Woman	Physical Therapy	20	Classroom-based	3
13	James	Man	Dentistry	22	Classroom & Practice-based	7

	Pseudonym	Gender	Primary Affiliation	Years in Profession	Role in IPE	Years in IPE
14	Jenna	Woman	Social Work	8	Classroom-based	6
15	Julia	Woman	Occupational Therapy	32	Classroom & Practice-based	6
16	Kim	Woman	Medicine	23	Classroom & Practice-based	10
17	Luna	Woman	Nursing	8	Classroom-based	5
18	Lucy	Woman	Pharmacy	5	Classroom-based	3
19	Madeline	Woman	Speech-language pathology	12	Classroom-based	6
20	Mariam	Woman	Occupational Therapy	10	Classroom-based	10
21	Noah	Man	Medicine	10	Practice-based	10
22	Sophia	Woman	Physical Therapy	25	Classroom & Practice-based	20
23	Violet	Woman	Clinical Psychology	13	Classroom & Practice-based	13
24	Victoria	Woman	Physician Assistant	24	Classroom-based	13
25	William	Man	Pharmacy	14	Classroom & Practice-based	6
26	Zoe	Woman	Medicine	15	Classroom-based	6

6.3.5 Data Collection and Analysis

Participants were recruited through convenience sampling via email, which was drafted by the researchers and distributed by the offices/centres for IPE. The recruitment email contained a link to three Qualtrics questionnaires (Qualtrics International, Inc, 2009) that collected (1) demographic information (primary affiliation, gender, years in profession, role in IPE, and number of years involved in IPE), (2) contact details (institutional email addresses) and Informed Consent, and (3) scheduling/availability preferences for interviews. Demographic data were tabulated and analyzed using IBM SPSS Statistics for Windows, Version 26 (IBM Corp., 2019).

Participants were individually interviewed using a semi-structured format (see Appendix 9 for interview guide). The use of semi-structured interviews allowed participants to describe their own unique perspectives yet permitted the use of a similar focus of topics across all interviews. The interviews, which lasted between 25 and 75 minutes, were conducted online via Zoom Web Conferencing (Zoom Video Communications, Inc., 2011), video-recorded, and transcribed verbatim. Transcripts were shared with and member-checked (Creswell & Creswell, 2018) by the participants to enhance the credibility and authenticity of the findings. Each participant was given as a token of appreciation for their time a $100 Amazon.ca eGift Card.

The qualitative data from the interviews were inductively coded and analyzed through thematic content analyses using NVivo 12 (QSR International, 2020). Several cycles of coding were employed until saturation was reached (Saldaña, 2021), where no more new themes emerged. Specifically, open coding was used first to analyze the transcripts to identify the IPE-specific enablers, barriers/challenges, implications and outcomes as experienced by the facilitators and preceptors. Next, we categorized the coded data based on common, emergent themes.

6.4 Results and Discussion

This qualitative study explored the experiences of classroom-based IPE facilitators and practice-based IPE preceptors when delivering integrated IPE curriculum. Our findings can be categorized into six main themes: (1) Gender Representation; (2) Availability of Facilitators and Preceptors; (3) Mode of Delivery; (4) Nature of Curriculum; (5) IPE Perceived as Extracurricular; and (6) Limited and Inequitable Practice-Based IPE.

6.4.1 Gender Representation

Approximately 81% of the participants (*n* = 21) were women. Participants reported that this gender discrepancy may reflect the many HASC professions that are female dominated. According to a recently published report by Statistics Canada (Khanam et al., 2022), approximately 75% of all care workers in Canada are women. Similarly, approximately 80% of all students enrolled in HASC professional degree programs in Canada are women (Statistics Canada, 2022). This is especially true of the professions (e.g., nursing, occupational therapy, pharmacy, physical therapy, social work, and speech-language pathology) with which approximately 58% of our participants are affiliated. The gender discrepancy of our participants seems to reflect the discrepancy observed in the HASC professions. One of our participants (Hannah) also observed this, stating that these discrepancies may have occurred "naturally."

Further, participants explained that most facilitators and preceptors, including patient partners, with whom they work are women. Participants explained that HASC practitioners who identify as men tend to assume more administrative roles and/or work in the private sector where they make more money and therefore find volunteering for IPE-related activities less appealing. The research literature illustrates that this is also true of patient partners who are facilitators and/or preceptors of interprofessional learning opportunities (Abelson et al., 2022; Dukhanin et al., 2020; Sayani et al., 2021). Participants reasoned that men tend to be

"drawn more to areas that involve more prestige and power" (Emma) and that those "who are motivated by status are less likely to become involved in these initiatives" (Violet).

6.4.2 Availability of Facilitators and Preceptors

Although most participants agreed that there are ample numbers of faculty and/or clinicians who can potentially be involved with facilitating IPE, finding individuals willing to facilitate remains a challenge. Participants attributed this difficulty to several reasons. First, many faculty and clinicians do not see the value of participation in IPE, either because they "assume that they collaborate well by virtue of their training and don't see the need for interprofessional training to do that better" (Violet) or because they "work in a remote community as sole practitioners and have little to do with other professions" (Isabella). Similarly, most facilitators and preceptors are driven by passion for IPE, especially when the topic is relevant to their professional practice; one participant indicated that, "I volunteer to facilitate IPE sessions that are on topics that are of interest to me or within my own professional experience and not in other areas" (Mariam). Additionally, faculty and clinicians may be interested to facilitate IPE but may not even know of that option. Mariam reports that "many new faculty members don't necessarily know about the [IPE] curriculum and the opportunities for involvement until they go looking for it or make a personal connection out of personal interest." These issues point to lack of awareness of the inherent obligations that HASC faculty and clinicians should have in preparing their students for effective IPCP. Therefore, it is recommended that the offices/centres for IPE initiate more regular and consistent outreach into individual faculties, departments, and hospitals to build relationships with all faculty members and clinicians.

Further, faculty and clinicians who know of the IPE opportunities may choose not to participate due to lack of sufficient incentives. For instance, whereas IPE facilitation may add value to teaching stream faculty's teaching dossiers and Progression Through the Ranks (PTR)

reports, research stream faculty “certainly don’t get enough recognition from our home departments” (Victoria). Further, IPE-related work “is much more onerous and requires a lot more preparation” (Violet) compared to uni-professional coursework, yet facilitators and preceptors generally “[receive] no extra payment for these activities” (Victoria). Further, even if financial compensation were provided, “remuneration in private practice is so much higher than what the university may offer. It isn’t a sufficient incentive” (Isabella). One participant further reported that,

> We rely on the good will of our clinical community to provide free service with nothing in return. If there was a budget, I think you could better recognize and show value and appreciation to the people who bring forth their expertise. (Julia)

Lastly, faculty who are also practicing clinicians may choose not to facilitate IPE due to scheduling conflicts and “constraints around having to maintain a clinical practice that always is going to supersede everything else. It makes sense that you choose things that are valued by those who employ you” (Violet). Similar findings were reported by Racine et al. (2013), who reported that issues like time constraints, lack of time, and lack of knowledge and skills influence faculty’s willingness and readiness to facilitate IPE activities. Similarly, engaging clinicians has been particularly challenging, especially over the last few years during the COVID-19 pandemic, as the IPE teaching load takes away from their clinical load. One participant added that,

> It means that I have to ask my employer if I can take that time off work to [facilitate IPE]. There’s no budget for it and the managers are not obliged to release those people to get engaged in those sessions. (Julia)

For these reasons, HASC professional degree programs and their respective administrative leadership are recommended to provide meaningful incentives to attract more

faculty and clinicians to contribute to the IPE curriculum. These incentives may range from simple recognition (e.g., parking validation) to modifying faculty and clinicians' contracts so that the time they spend preparing for and participating in IPE sessions are counted towards their work time and for promotion. Further, more comprehensive and philosophically aligned partnerships among the HASC professional degree programs and HASC delivery systems may help administrators understand the need for their clinicians to participate in the IPE curriculum and therefore consider the time needed for this participation when allocating clinical duties. Lastly, professional bodies may prepare future members of their profession by encouraging them to participate in professional development to maintain their membership.

6.4.3 Mode of Delivery

Use of online platforms during the COVID-19 pandemic encouraged more faculty and clinicians to facilitate IPE sessions as online facilitation offered more logistical flexibility and eliminated the challenges associated with geographical co-location, commuting, finding parking, and finding adequate educational spaces for in-person sessions. One participant noted that "You can hire people from all over the place. We have been able to hire people who are 10 hours away. It exposes our students to other realities" (Aaliyah). Students also enjoyed similar benefits as they had the opportunity to participate in IPE without having to travel across campus or between campuses to attend sessions in-person, thereby avoiding late arrivals "that break the rhythm of our discussions" (Luna). Another benefit relates to equitable opportunities, where students who participate in IPE on the smaller campuses did not feel "disenfranchised" because "they feel that they don't have the same access [other students have] to in-person activities" (Julia).

Nonetheless, participants indicated that IPE held virtually only works when appropriate technological infrastructure and technical support are provided. Further, facilitators, preceptors, and patient partners were reported to encounter difficulties

connecting and building working relationships with students online and providing support to student groups during simultaneous breakout room discussions. One participant noted that "you're not going to have those 'water cooler' conversations [online]. That's where those relationships build. They don't happen as naturally on Zoom as they would in-person" (Julia). Similarly, implementing IPE online limited the creation of a sense of community, as facilitators and preceptors noticed decreased interpersonal communication and limited eye contact online, perhaps due to inability to express and observe nonverbal cues and body language. Further, participants stated that some students turned their cameras off, were not as attentive, and passively engaged, compared to in-person sessions. We argue that these barriers/challenges, which have also been reported by other researchers (see Joseph et al., 2021; Mukherjee et al., 2021), compromise the interactive nature of the 'learn with, from, and about each other' component of IPE, especially during activity-based sessions.

That being said, the presence of these barriers/challenges does not warrant disregarding the use of virtual technologies for IPE. Participants stipulated that "there is a time and place for both. Hybrid learning has a lot of potential" (Victoria), where activities may be done during in-person sessions while discussion-based sessions may be held online. This hybrid approach has also been supported by HASC professional students, as the use of both virtual and in-person sessions creates a balance between feelings of isolation and those of a sense of community (McCleary-Gaddy et al., 2022). Students also reported that the hybrid approach's flexibility and use of online collaborative technologies improved their understandings the six interprofessional competency domains (CIHC, 2010) and how they may effectively implement IPCP (Lazinski et al., 2021).

6.4.4 Nature of Curriculum

The core, mandatory IPE sessions bring students together from all participating programs. Participants argued that this approach requires use of broad topics, which in turn

makes some students feel irrelevant and undervalued, generates less authentic learning experiences, and is unreflective of future practice. Rather, participants called for more focused topics with students from professions who will ultimately work together with aim to "mirror what happens in real practice" (Noah). In so doing, the participants would like to have formal inter-institutional partnerships established between their programs and other professional (e.g., dental hygiene, pharmacy technician, physical therapy assistant) programs offered elsewhere. This approach, where inter-institutional relationships extend beyond the intra-institutional IPE curriculum, has been deemed progressive and exemplary by the CIHC's Accreditation Standards Committee (Azzam et al., 2022a).

6.4.5 IPE Perceived as Extracurricular

Although IPE is *integrated* in the curriculum (see Azzam et al., In Press), participants argued that current practices of how IPE is integrated sends unintended messages (hidden curriculum) that, perhaps indirectly, lead students to perceive IPE as extracurricular and/or not as valued as the uni-professional components of their curriculum. For instance, many IPE sessions are held on Thursday and Friday evenings and/or weekends—times when students may be tired and hungry following a long day and/or week of uni-professional coursework. Further, many participants contended that if students were to be expected to understand that interprofessional competency is required of them to enact their professional roles, they must also be made aware of the value of the IPE to which they are exposed. Although some IPE sessions are mandatory, "IPE tends to be ad hoc curricular activities that are not for-credit courses. When IPE is not for-credit, that sends a very strong message to students that 'This is just extra.' 'This is not what you will be graded on.'" (William). These findings have also been illustrated elsewhere (see Voyce, 2020). For these reasons, many students "don't understand the value of why they're there and what to take away from it" and believe that "we have to just answer these questions for this activity and get out of here" (Mariam).

Moving forward, we posit that changes to the current IPE models are warranted, where “what we really need is a culture shift where IPE is more integrated in the curriculum” (Emma). The participants also indicated that this shift is needed and reported that,

> I think one of the key pitfalls is to think about the IPE curriculum as a stand-alone curriculum. I think educators should be challenging themselves to not think of it like that. I really think that that is detrimental and is a limitation to the scaffolding that IPE requires. So, IPE should be embedded throughout all aspects of the uni-professional curriculum, not as a stand-alone curriculum. I don't think we have accomplished that yet. I have yet to see an example where that exists. I also think teaching cases in isolation is also problematic. This is where you train the students to think uni-professionally and then have these additional activities that are labeled “IPE”, and they're sprinkled in throughout the curriculum. To me, that's not reflective of practice. (William)

> What I would love to see is more blended learning between the professional groups in their core activities. So, when you're doing a course in biomechanics, for example, then that course should have physical therapy, occupational therapy, and kinesiology students all together learning about biomechanics. They should be living and breathing it together, rather than “We've all done our biomechanics courses separately and then in the evening we're coming together from 7 PM to 9 PM.” (Julia)

HASC professional degree programs are recommended to offer for-credit and more comprehensive interprofessional learning opportunities that enable their students to better appreciate and value their exposure to and immersion in IPE. The programs are also recommended to collaborate to find common time earlier in the week (i.e., Monday or Tuesday) and earlier in the day (i.e., morning) that can be dedicated to IPE; this approach

would convey to the students that the institution, faculties, and individual programs value IPE equally as the uni-professional components of their curriculum.

6.4.6 Limited and Inequitable Practice-Based IPE

The participants generally indicated that their current students "have better knowledge of the different professions and have a respectful and courteous way of exploring the other dimensions of their work and how they can integrate themselves into the team" (Madeline). Although there was consensus that the students who are currently enrolled in their programs and participate in IPE are much more prepared for IPCP than their predecessors, there was also consensus that the students' engagement in interprofessional learning remains insufficient—especially in primary care settings. For instance, one participant noted that,

> I wish we had an IPE activity for every single therapeutic area and also for every, single type of practice-based environment that students may see on practicum. So, I'd love to see what IPE looks like in a busy, community pharmacy that's a retail chain versus an independent [pharmacy] versus a primary care center versus a long-term care center. Even the same case from here to here to here as patients transition would be helpful. (William)

Another participant also alluded that the students are not equitably immersed in practice-based IPE during their placements. She stated that,

> [Some] hospitals, community sites, and private practices don't have a connection to the IPE curriculum. When I send a student off to do a placement in a hospital that cannot offer a structured IPE placement, that student is not going to get the same experience as everyone else. That creates inequities. (Julia)

The offices/centres for IPE and their participating HASC professional degree programs are recommended to equitably provide for all their students more diverse learning opportunities that address the interprofessional competency domains (CIHC, 2010) in a wider range of primary care settings. This approach would better prepare their students for a broader scope of practice in the workplace where they can effectively implement IPCP. The offices/centres for IPE are also encouraged to consider extending their influence into more primary care settings with which they are currently not partnered; this approach may influence adoption of an interprofessional culture at these workplaces that may reflect more equitable placement opportunities for all students.

6.4.7 Limitations and Future Directions

There were several limitations to this study. First, no one profession was represented across all four participating institutions; future researchers are recommended to employ purposeful sampling with aim to involve as many professions as possible across all institutions. Further, the types and order of questions presented on the screening questionnaires and during the interviews may have influenced question-order, recall, and social desirability biases by the participants. In addition, the participants also had inconsistent levels of experience and involvement with the IPE curriculum, ranging between three and 20 years (μ = 8). Similarly, the small number of participants (N = 26) may have limited the findings of this study; additional interviews with more experienced classroom-based IPE facilitators and practice-based IPE preceptors may have generated more divergent themes and/or inconsistent perceptions. Further, this research revealed the perspectives and experiences of the facilitators and preceptors of the IPE curriculum models at four large institutions in Canada. Future research should examine the impacts of the IPE curriculum models from the perspectives of students and novice graduates who have recently entered the workforce. Similarly, these findings may not be generalizable to smaller sized institutions and, therefore,

research that explores the impacts of IPE at smaller institutions is also warranted. Lastly, generating a HASC workforce capable of effective IPCP can only be productive if HASC delivery systems value team-based collaborative efforts. As such, future research should also explore whether and how primary care settings cultivate an interprofessional culture for effective IPCP.

6.5 Conclusions

This qualitative case study (Yin, 2018) explored the impacts of four Canadian integrated IPE curriculum models in generating a collaboration-ready HASC workforce capable of effectively implementing IPCP over time and into practice. These four curriculum models employ a longitudinal approach to IPE that includes both classroom-based and practice-based interprofessional learning opportunities that lead to direct student-centred outcomes and eventual improved patient/client-oriented outcomes. Nonetheless, several recommendations with aim to improve the sustainable delivery of IPE include: provision of substantial incentives to attract more faculty and clinicians to contribute to the IPE curriculum; implementation of a hybrid model that involves both in-person activity-based sessions and virtual discussion-based sessions; establishment of inter-institutional partnerships that extend beyond the intra-institutional IPE curriculum; offering of for-credit and more comprehensive interprofessional learning opportunities that enable students to appreciate and value their exposure to and immersion in IPE; and equitable provision of diverse interprofessional learning to all students in primary care settings.

By effectuating these recommendations, these four institutions can have substantial influences on other IPE curriculum implementation programs in Canada and further reinforce Canada's global leadership in IPE and IPCP research, policymaking, and practice. Further, this research study is significant to the extent that the findings described herein reinforce the

WHO's efforts to promote sustainable integration of IPE in the programmatic structures of the HASC professional degree programs with aim to improve patient/client-centred care.

Chapter 7

7 Summary and Future Work

Following recommendations from the World Health Organization (WHO) and under the directive of the Government of Canada, the Royal Commission on the Future of Health Care in Canada (Romanow, 2002) advised that health and social care (HASC) professional degree programs effectively prepare their students for interprofessional collaborative practice (IPCP) upon graduation. Consequently, Health Canada instituted the Interprofessional Education for Collaborative Patient-Centred Practice (IECPCP) initiative (2004–2011), through which interprofessional education (IPE) was officially endorsed as an innovative educational approach leading to effective IPCP and eventual improved patient/client-oriented outcomes. Further, the IECPCP initiative led to the establishment of the Canadian Interprofessional Health Collaborative (CIHC) in 2006, which published its now globally recognized *National Interprofessional Competency Framework* (2010) and led the two-phase Accreditation of Interprofessional Health Education (AIPHE) project (2010, 2011).

These initiatives encouraged Canadian accrediting organizations and their respective HASC professional degree programs to mandate and deliver IPE. Nonetheless, achieving the intended patient/client-oriented outcomes of IPE and subsequent IPCP requires that IPE not only be delivered, but to be delivered *sustainably* (Grymonpre et al., 2016a, 2016b). Sustainable delivery of IPE can only be done by deliberately and purposefully addressing several systemic (macro-level), institutional (meso-level), and teaching (micro-level) factors (D'Amour and Oandasan, 2005). Studying the extent to which these factors are currently addressed by HASC professional degree programs has been prioritized by the Global Confederation for Interprofessional Education and Collaborative Practice (IP.G), which recommends synthesis of "evidence of [IPE's] impact along the continuum from

interprofessional education to collaborative practice in person- and community-centred service delivery" (Khalili et al., 2019, p. 15).

In this dissertation, we took a purposeful and systematic approach to explore the extent to which these multi-tiered factors influence effective IPCP leading to patient/client-oriented outcomes in the Canadian context. Our initial systematic review (Chapter 2; Azzam et al., 2022b) and subsequent (macro-level) comparative analysis of accreditation standards documents (Chapter 3; Azzam et al., 2021) revealed three major research gaps: (1) that most IPE initiatives lacked the use of theoretical and conceptual frameworks; (2) that the IPE-relevant accreditation standards overwhelming emphasis on the *Students* and *Educational Program* domains (AIPHE, 2010, 2011) alone potentially compromises the sustainability of IPE; and (3) that longer IPE initiatives with greater intensity and more rigorous methodological and assessments methods are warranted.

To address the first research gap, in our conceptual paper (Chapter 4; Azzam & Puvirajah, In Press), we discussed the importance of curriculum theory and learning to HASC professional education processes and proposed a theoretical framework for productive engaged learning in the professions through which IPE opportunities may be grounded. We invite IPE practitioners and researchers to leverage this theoretical framework to guide their initiatives, improve the evaluation of intended student learning outcomes, and stimulate more sustainable IPE delivery.

To address the second and third research gaps, we explored the integration of IPE curriculum models (meso- and micro-level) in the programmatic structures at four, large Canadian post-secondary institutions (Chapter 5; Azzam et al., In Press). We further explored the enablers, barriers/challenges, limitations, and outcomes of these curriculum models, as perceived by classroom-based facilitators and practice-based preceptors of the IPE activities and whether they truly lead to effective IPCP (Chapter 6).

The findings of these research studies illustrate that IPE in Canada is trending in a positive and promising direction, and that Canada and Canadian HASC professional education degree programs are at the forefront of IPE and IPCP innovation and implementation. The four curriculum models examined here employ longitudinal approaches to IPE that include both classroom-based and practice-based interprofessional learning opportunities that have been suggested to lead to direct student-centred outcomes and eventual improved patient/client-oriented outcomes. Our future research will examine to the extent to which these IPE curriculum models lead to sustained IPCP. Based on our findings, we offer HASC professional degree programs the following recommendations: to provide substantial incentives to attract more faculty and clinicians to contribute to their IPE curriculum; implement IPE using a hybrid approach that involves both in-person activity-based sessions and virtual discussion-based sessions; establish inter-institutional partnerships that extend beyond their curriculum; offer for-credit and more comprehensive interprofessional learning opportunities that enables students to appreciate and value their exposure to and immersion in IPE; and equitably provide diverse interprofessional learning to all students in primary care settings. By effectuating these recommendations, these four institutions can have substantial influences on other IPE curriculum implementation programs in Canada and further reinforce Canada's global leadership in IPE and IPCP research, policymaking, and practice. Further, the findings discussed in this dissertation reinforce the WHO and CIHC's efforts to promote sustainable integration of IPE in the programmatic structures of the HASC professional degree programs worldwide with aim to improve patient/client-centred care.

The long-term objectives of our research are to study the many facets of IPE and IPCP in HASC professional degree programs and HASC delivery systems, respectively, and their eventual impacts on patient/client-oriented outcomes in Canada. In the future, we plan to extend our research to further explore the impacts of the four integrated IPE models through

field observations of curriculum implementation, interviews with senior HASC professional students, and interviews with novice HASC practitioners (recent graduates). We plan to leverage the findings from these three studies to scale up the research to include many more post-secondary institutions and teaching hospitals, examine whether and how integrated IPE curriculum models impact IPCP many years into practice, and explore whether and how HASC delivery systems provide adequate resources, physical space, and interprofessional culture for effective IPCP in primary care settings.

Chapter 8

8 Bibliography

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Appendices

Appendix 1 *Non-Exhaustive List of Data to be Extracted from Included Articles (n = 37)*

Study Profile

- Country and institution where study was conducted
- Research purpose, approaches, and design
- Theoretical and/or conceptual framework(s)
- Recruitment strategies of participants
- Outcomes and assessment methods (e.g., surveys, interviews, observations)
- Limitations of the study

Characteristics of Intervention

- Professions included
- Subject area for intervention conducted
- Duration, years, and frequency of intervention
- Educational strategies
- Description of intervention development
- Developers of intervention
- Incentives given to participants and facilitators
- Type of participation (mandatory vs. optional)
- Administrative support and strategies for faculty development
- Challenges encountered

Students/Participants

- Number of participants involved per profession
- Age range, sex/gender, and level and year of study of participants
- Student-centred outcomes

Educators/Facilitators

- Number of facilitators involved per profession
- Roles, responsibilities, and qualifications of facilitators
- Age range, sex/gender, and level and year of study of participants
- Facilitator-oriented outcomes

Appendix 2 *Studies Analyzed in the Systematic Review (n = 37)*

Study ID	Country	Institutions	Research approach	Recruitment strategies of participants	Subject area	Duration of intervention	Instruments for data collection
Achike et al., 2014	United States	William Carey University	Mixed methods	Convenience sampling	Disease management	120 minutes	Unspecified survey
Allen et al., 2020	United States	Dominican University	Quantitative	Convenience sampling	Disease management	Unspecified	Ryff's Psychological Well-Being Scale (RBWBS; Bayani et al., 2008)
Brashers et al., 2016	United States	University of Virginia	Mixed methods	Convenience sampling	Geriatric care; critical care; pediatric care; transitional care	2 years	Team Skills Scale (TSS; Hepburn et al., 2002); Collaborative Behaviors Observational Assessment Tool (CBOAT, Blackhall et al., 2014)
Brewer & Flavell, 2020a	Australia	One; unspecified	Qualitative	Convenience sampling	Pediatric care; geriatric care	14 weeks	Observations
Brewer et al., 2017	Australia	Curtin University	Qualitative	Convenience sampling	Geriatric care; pediatric care	14 weeks	Focus groups
Buckley et al., 2012	United Kingdom	University of Birmingham; Birmingham City University; University of Worcester.	Mixed methods	Convenience sampling	Pain management; disease management	Half day	Unspecified survey

Study ID	Country	Institutions	Research approach	Recruitment strategies of participants	Subject area	Duration of intervention	Instruments for data collection
Cunningham et al., 2020	United States	Three; unspecified	Mixed methods	Convenience sampling	Geriatric care	45 minutes	Interprofessional Socialization and Valuing Scale (ISVS, King et al., 2010); focus groups
Delisle et al., 2016	Canada	University of Manitoba	Quantitative	Convenience sampling	Interprofessional competencies	4 weeks	University of the West of England Interprofessional Questionnaire (UWE IPQ; Pollard et al., 2004)
Djukic et al., 2015	United States	One; unspecified	Quantitative	Convenience sampling	Geriatric care	1 year	Team Skills Scale (TSS; Hepburn et al., 2002); Attitudes Toward Health Care Teams Scale (ATHCTS; Heinemann et al. 1999)
Doucet et al., 2016	Canada	Dalhousie University	Qualitative	Convenience sampling	Unspecified	Unspecified	Interviews
Ekmekci, 2013	United States	One; unspecified	Quantitative	Unspecified	Unspecified	1 week	Sociograms
Erickson et al., 2016	United States	University of Wisconsin-Milwaukee; University of Virginia; University of Southern California	Quantitative	Convenience sampling	Pain management	3 hours	Unspecified survey

Study ID	Country	Institutions	Research approach	Recruitment strategies of participants	Subject area	Duration of intervention	Instruments for data collection
Fernandes et al., 2015	Canada	One; unspecified	Mixed methods	Convenience sampling	Gross anatomical dissection	10 weeks	Revised Readiness for Interprofessional Learning Scale (RIPLS; McFadyen et al., 2006); revised Interdisciplinary Education Perception Scale (IEPS; McFadyen et al., 2007); participants' feedback; focus groups
Fishman et al., 2020	United States	One; unspecified	Mixed methods	Unspecified	Pain management	150 minutes	Pain Knowledge and Beliefs Questionnaire (PKBQ; Hunter et al., 2008); open-ended questions
Hodges & Massey, 2015	United States	Mercer University	Mixed methods	Convenience sampling	Unspecified	4 weeks	Unspecified survey
Howell et al., 2012	United States	One; unspecified	Qualitative	Convenience sampling	Disease management	8 weeks	Interviews
Kaasalainen et al., 2015	Canada	Seven; unspecified	Mixed methods	Unspecified	Palliative care	Five days	Revised Readiness for Interprofessional Learning Scale (RIPLS; McFadyen et al., 2006); Professional Identity and Team Understanding (PITU, Adams et al., 2006); open-ended questions

Study ID	Country	Institutions	Research approach	Recruitment strategies of participants	Subject area	Duration of intervention	Instruments for data collection
Kenaszchuk et al., 2012	Canada	One; unspecified	Quantitative	Convenience sampling	Palliative care	3 hours	revised Interdisciplinary Education Perception Scale (IEPS; McFadyen et al., 2007); University of the West of England Interprofessional Questionnaire (UWE-IPQ; Pollard et al., 2004); Attitudes Toward Health Care Teams Scale (ATHCTS; Heinemann et al. 1999)
Kerry et al., 2017	Germany	One; unspecified	Quantitative	Convenience sampling	Unspecified	3 weeks	Unspecified survey
Khalili & Orchard, 2020	Canada	One; unspecified	Mixed methods	Purposive sampling	Unspecified	5 weeks	Interprofessional Socialization and Valuing Scale (ISVS; King et al., 2010); Individualism-Collectivism Scale (ICS; Wagner, 1995); dual Identity Scale (DIS; Khalili, 2013); participants' reflections; audio-recorded small group workshop discussions
King et al., 2014	Canada	Four; unspecified	Quantitative	Convenience sampling	Geriatric care; disease management	3 hours	University of the West of England Interprofessional Questionnaire (UWE-IPQ; Pollard et al., 2004)

Study ID	Country	Institutions	Research approach	Recruitment strategies of participants	Subject area	Duration of intervention	Instruments for data collection
Langford et al., 2020	United States	University of Washington	Quantitative	Convenience sampling	Pain management; disease management	110 minutes	Interprofessional collaborative competency attainment scale (ICCAS; Archibald et al., 2014)
Lockeman et al., 2017	United States	One; unspecified	Mixed methods	Convenience sampling	Interprofessional competencies	2 months	Student Perceptions of Interprofessional Clinical Education-Revised instrument, version 2 (SPICE-R2; Zorek et al., 2016); participants' feedback
Luctkar-Flude et al., 2014	Canada	One; unspecified	Mixed methods	Convenience sampling	Disease management	150 minutes	University of the West of England Interprofessional Questionnaire (UWE-IPQ; Pollard et al., 2004); faculty feedback; observations
MacKenzie et al., 2017	Canada	Dalhousie University	Mixed methods	Unspecified	Disease management	90-minute	Interprofessional collaborative competency attainment scale (ICCAS; Archibald et al., 2014); observations; participants' reflections
New et al., 2015	United States	One; unspecified	Quantitative	Unspecified	Geriatric care	Unspecified	Unspecified survey; participants' reflections
Olaisen et al., 2014	United States	One; unspecified	Mixed methods	Purposeful sampling	Disease management	12 hours	Unspecified survey

Study ID	Country	Institutions	Research approach	Recruitment strategies of participants	Subject area	Duration of intervention	Instruments for data collection
O'Rourke & Brown, 2017	United States	One; unspecified	Mixed methods	Convenience sampling	Dental care	One day	Interprofessional collaborative competency attainment scale (ICCAS; Archibald et al., 2014); Attitudes Toward Health Care Teams Scale (ATHCTS; Heinemann et al. 1999); participants' feedback
Park et al., 2014	United States	One; unspecified	Quantitative	Convenience sampling	Geriatric care	Unspecified	Jefferson School of Attitudes Toward Physician-Nurse Collaboration (JSAPNC; Hojat et al., 1999)
Price et al., 2020	Canada	Dalhousie University	Qualitative	Convenience sampling	Unspecified	Unspecified	Interviews
Reising et al., 2017	United States	One; unspecified	Quantitative	Convenience sampling	Disease management	120 minutes	Observations using the Indiana University Simulation Integration Rubric (IUSIR)
Rossler & Kimble, 2016	United States	One; unspecified	Mixed methods	Convenience sampling	Unspecified	Unspecified	Revised Readiness for Interprofessional Learning Scale (RIPLS; McFadyen et al., 2006); Health Professional Collaboration Scale (HPCS; Reese et al, 2010); focus groups

Study ID	Country	Institutions	Research approach	Recruitment strategies of participants	Subject area	Duration of intervention	Instruments for data collection
Solomon & Salfi, 2011	Canada	One; unspecified	Mixed methods	Convenience sampling	Unspecified	3 hours	revised Interdisciplinary Education Perception Scale (IEPS; McFadyen et al., 2007); focus groups
Solomon et al., 2010	Canada	Four; unspecified	Mixed methods	Convenience sampling	Interprofessional competencies	Unspecified	Unspecified survey; students' online discussions; focus groups
Stull & Blue, 2016	United States	One; unspecified	Quantitative	Convenience sampling	Interprofessional competencies	12 weeks	Revised Readiness for Interprofessional Learning Scale (RIPLS; McFadyen et al., 2006); revised Interdisciplinary Education Perception Scale (IEPS; McFadyen et al., 2007)
Sytsma et al., 2015	United States	One; unspecified	Mixed methods	Unspecified	Gross anatomical dissection	Unspecified	Revised Readiness for Interprofessional Learning Scale (RIPLS; McFadyen et al., 2006); follow-up, unspecified survey
Zheng et al., 2019	Canada	McMaster University	Mixed methods	Convenience sampling	Gross anatomical dissection	Not applicable; follow-up study	Revised Readiness for Interprofessional Learning Scale (RIPLS; McFadyen et al., 2006); open-ended questions

Appendix 3 *Theoretical and Conceptual Frameworks Used in Included Articles (n = 37)*

Framework	Used by
Social psychology theoretical frameworks	
Intergroup contact hypothesis (Allport, 1954)	Brewer & Flavell (2020)
Interprofessional socialization framework (Khalili et al., 2013)	Khalili & Orchard (2020); Price et al. (2020)
Narrative theory (Clark, 2014)	Price et al. (2020)
Six-factor model of psychological well-being (Ryff, 2014)	Allen et al. (2020)
Social Identity Theory (SIT; Kegan, 1983)	Stull & Blue (2016)
Educational/Learning theoretical frameworks	
Andragogy (Knowles, 1990)	Hodges & Massey (2015); Solomon & Salfi (2011)
Constructive alignment (Biggs, 1996)	Brewer & Flavell (2020)
Experiential learning (Kolb, 1984)	Reising et al. (2017); Rossler & Kimble (2016)
Presage-process-product model for IPE (Freeth & Reeves, 2004)	Brewer et al. (2017)
Conceptual frameworks	
Accreditation of Interprofessional Health Education (AIPHE, 2010, 2011)	MacKenzie et al. (2017)
A national interprofessional competency framework (Canadian Interprofessional Health Collaborative, 2010)	MacKenzie et al. (2017)
Core competencies for interprofessional collaborative practice (Interprofessional Education Collaborative, 2011)	Kerry et al. (2017)
Indiana University Team Education Advancing Collaboration in Healthcare (Indiana University Center for Interprofessional Practice and Education; IUCIPPE, 2016)	Reising et al. (2017)
Interprofessional capability framework (Brewer & Jones, 2013)	Brewer & Flavell (2020)
Interprofessional Education for Collaborative Patient-Centred Practice (D'Amour & Oandasan, 2005)	Park et al. (2014)
Standards for Quality Improvement Reporting Excellence (SQUIRE, Davidoff et al., 2008)	Delisle et al. (2016)

Appendix 4 *Outcomes and Assessment Measures in Included Articles (n = 37)*

Outcomes and assessment measures	***n***
Quantitative surveys	41
Revised Readiness for Interprofessional Learning Scale (RIPLS, McFadyen et al., 2006)	6
University of West of England Interprofessional Questionnaire (UWE-IPQ, Pollard et al., 2004)	4
Revised Interdisciplinary Education Perception Scale (IEPS; McFadyen et al., 2007)	4
Attitudes Toward Health Care Teams Scale (ATHCTS; Heinemann et al. 1999)	3
Interprofessional Collaborative Competency Attainment Scale (ICCAS, Archibald et al., 2014)	3
Interprofessional Socialization and Valuing Scale (ISVS, King et al., 2010)	2
Team Skills Scale (TSS, Hepburn et al., 2002)	2
Dual Identity Scale (DIS, Khalili, 2013)	1
Health Professional Collaboration Scale (HPCS, Reese et al, 2010)	1
Jefferson Scale of Attitudes towards Physician-Nurse Collaboration (JSAPNC, Hojat et al., 1999)	1
Individualism-Collectivism Scale (ICS, Wagner, 1995)	1
Pain Knowledge and Beliefs Questionnaire (PKBQ; Hunter et al., 2008)	1
Professional Identity and Team Understanding (PITU, Adams et al., 2006)	1
Ryff's Psychological Well-Being Scale (RBWBS; Bayani et al., 2008)	1
Student Self-Assessment via the Student Perceptions of Interprofessional Clinical Education-Revised instrument, version 2 (SPICE-R2; Zorek et al., 2016)	1
Unspecified	9
Semi-structured interviews and focus groups	9
Open-ended (qualitative) surveys	8
Observations	3
Collaborative Behaviors Observational Assessment Tool (CBOAT; Blackhall et al., 2014)	1
Indiana University Simulation Integration Rubric (IUSIR; IUCIPPE, Indiana University Center for Interprofessional Practice and Education, 2016)	1
Unspecified	1
Other	3

Appendix 5 *Regulated Health and Social Care Professions in Canada (N = 42)*

1. Acupuncture	22. Nursing (Registered Nurse)
2. Audiology	23. Nursing (Nurse Practitioner)
3. Audiology prostheses specialist	24. Nursing (Registered Psychiatric Practitioner)
4. Auxiliary nursing care	25. Nutrition
5. Cardiology technician	26. Occupational therapy
6. Chinese traditional medicine	27. Optical/optician
7. Chiropractic	28. Optometry
8. Counseling therapy	29. Orthotics/prosthetics
9. Dental assisting	30. Paramedicine
10. Dental hygiene	31. Pharmacy
11. Dental technician	32. Pharmacy technician
12. Dental therapy	33. Physiotherapy
13. Dentistry	34. Podiatric Surgery
14. Dietetics	35. Podiatry
15. Homeopathy	36. Psychology
16. Laboratory technician	37. Radiation oncology technician
17. Massage therapy	38. Radiology technician
18. Medicine	39. Respiratory therapy
19. Midwifery	40. Sexology
20. Multi-skilled technician	41. Social Work
21. Naturopathy	42. Speech language pathology

Appendix 6 *Accountable Statements in the Health and Social Care Professions' Accreditation Standards Documents*

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
CHIROPRACTIC						
1. The offerings must include … professional practice ethics and interprofessional collaboration (p. 33).				x		
2. Upon completing the course of study, each student will demonstrate … [that they can]: work collaboratively on an interprofessional basis for patient referral and/or management (p. 35).			x			
3. The program must provide evidence that demonstrates that the degree candidates, as a condition of graduation, have: engaged in collaborative activity with other health care and social care providers regarding the care of at least five (5) different patients (p. 41).				x		
4. The student must demonstrate the ability to: recognize the clinical indications for referral to or collaborative care with appropriate mental health professionals, agencies or programmes (p. 48).			x			
5. The student must demonstrate the ability to: identify personal and/or professional care limitations and recognize the need for patient referral and/or collaborative care (p. 52).			x			
6. The student must demonstrate the ability to: identify practices that foster collaboration with other health and social care providers (p. 53).			x			
7. The student must demonstrate the ability to: work collaboratively on an inter or intra professional basis for patient referral and or management as clinically indicated (p. 54).			x			
8. The student must demonstrate the ability to: initiate referral or collaborative care when appropriate to the needs of the patient (p. 54).			x			
9. The student must demonstrate the ability to: recognize the need to monitor the patient's response to care and modify the care plan, consult with, or refer to another health care provider (p. 57).			x			

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
CHIROPRACTIC (continued)						
10. The student must demonstrate the ability to: recognize and respond to patient concerns and apprehension that may result from proposed changes in a care plan or the need for referral or collaborative care (p. 57)			x			
11. Interpersonal skills should be assessed by reviewing performance in collaboration with staff, members of the patient care team, and consultations with doctors of chiropractic and other health care providers as appropriate (p. 66).				x		
DENTISTRY						
1. The program must have competencies that describe the graduate of the program. Program-specific competencies must be consistent with the '*Competencies for a Beginning Dental Practitioner in Canada*' (p. 12).				x		
2. Describe the program's relationships with other health sciences educational programs that permit students to develop interprofessional working relationships, as appropriate, with other programs and students (p. 29).	x			x		
3. The program must have a functional relationship with at least one (1) hospital with a dental service approved by CDAC. This relationship must afford each student the opportunity to participate in the management of a patients' health and observe working relationships with other health professionals in a hospital (p. 29).	x			x		x
4. Describe the opportunities in place that permit each student to participate in the management of a patients' health and observe working relationships with other health professionals in a hospital. Attach as an appendix the schedule for these activities (p. 30).				x		x

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
DENTISTRY (continued)						
5. Students should be exposed to the principles of interprofessional collaboration for the provision of patient care (p. 30).			x			
6. Identify students' interprofessional experiences in the program (p. 30).			x			
DIETETICS						
1. The curriculum is student/intern centred and based on achieving the Integrated Competencies for Dietetic Education and Practice (p. 9).				x		
2. The curriculum sequencing is appropriate for progressive student/intern learning. Flow of learning builds in complexity with reinforcement as required to achieve the ICDEP (p. 9).				x		
3. Mapping of the curriculum demonstrating where and how the ICDEP are incorporated into components of the curriculum (p. 9).				x		
4. Course outlines/outcomes and/or practicum/ internship rotations objectives showing a link to the ICDEP (e.g., ICDEP Performance Indictors and Foundational Knowledge) (p. 9).				x		x
5. Student/intern tasks during all stages of learning must contribute to meeting ICDEPs in a meaningful way and must be at an appropriate level of complexity (p. 10).			x			
6. A description of learning activities that demonstrate a relationship to the ICDEP (e.g., Academic: Foundational Knowledge cognitive levels 1-3 achieved with course learning activities; Practicum: performance rating scale) (p. 10).				x		x
7. The curriculum provides opportunities to develop interprofessional practice skills (p. 10).				x		x
8. Demonstration of learning activities within the curriculum that build interprofessional practice skills (p. 10).				x		x
9. Preceptors are academically and experientially qualified for their role in assisting interns to achieve the ICDEP (p. 13).		x				

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
NURSING (REGISTERED)						
1. Partnerships refer to collaborations that support achievement of the unit's strategic goals, collaborations among educational units to deliver collaborative nursing education, and formal agreements with health service organizations, community-based agencies, members of other professions, and other relevant groups to provide professional and interprofessional learning opportunities for students (p. 12).	x					
2. Faculty are supported in providing interprofessional education and opportunities for intersectoral collaboration (p. 16).		x				
3. Practice placement sites provide learning opportunities that effectively help learners attain the outcomes of the nursing education program(s) and facilitate intra and interprofessional collaboration (p. 18).				x		x
4. The curriculum provides learning related to primary health care, health promotion, prevention, curative, supportive, rehabilitative, and end-of-life care, across the life span of individuals, families, groups, communities, and populations; promotes interprofessional practice, and addresses regulatory entry-to-practice competencies (p. 23).				x		
5. The program provides opportunities for learners to develop knowledge, skills, and attitudes in using relevant information, communication technology, critical thinking, and clinical reasoning, in the delivery of collaborative client-centered care (p. 25).				x		
6. The program provides opportunities for learners to develop the knowledge, skills, and attitudes to provide safe, ethical, and client-centred care as a member of the interprofessional team (p. 26).				x		x
7. The program provides opportunities for students to develop functional working relationships, including intra/interprofessional and intersectoral collaboration (p. 26).				x		x

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
MEDICINE (FAMILY MEDICINE)						
1. The residency program uses a comprehensive curriculum plan, which is specific to the discipline, and addresses all the CanMEDS/CanMEDS-FM Roles (p. 14).				x		
2. The curriculum plan addresses expert instruction and experiential learning opportunities for all the CanMEDS-FM Roles, with a variety of learning activities (p. 14).				x		x
3. Residents' clinical responsibilities are assigned in a way that supports the progressive acquisition of competencies and/or objectives, as outlined in the CanMEDS/CanMEDS-FM roles (p. 14).			x			
4. Resident training takes place in functionally inter- and intra-professional learning environments that prepare residents for collaborative practice (p. 17).				x		x
MEDICINE (SPECIALTY MEDICINE)						
1. The competencies and/or objectives address each of the Roles in the CanMEDS/CanMEDS-FM Framework specific to the discipline (p. 8).				x		
2. The residency program uses a comprehensive curriculum plan, which is specific to the discipline, and addresses all the CanMEDS/CanMEDS-FM Roles (p. 9).				x		
3. The curriculum plan addresses expert instruction and experiential learning opportunities for each of the CanMEDS/CanMEDS-FM Roles with a variety of suitable learning activities (p. 9).				x		x
4. Residents' clinical responsibilities are assigned in a way that supports the progressive acquisition of competencies and/or objectives, as outlined in the CanMEDS/CanMEDS-FM Roles (p. 9).			x			
5. Residents' clinical responsibilities, including on-call duties, provide opportunities for progressive experiential learning, in accordance with all CanMEDS/CanMEDS-FM Roles (p. 9).			x			x

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
MEDICINE (SPECIALTY MEDICINE; continued)						
6. The system of assessment meets the requirements within the specific standards for the discipline, including the achievement of competencies in all CanMEDS roles or CFPC evaluation objectives, as applicable (p. 10).			x			
7. Resident training takes place in functionally inter- and intra-professional learning environments that prepare residents for collaborative practice (p. 12).				x		x
MEDICINE (UNDERGRADUATE MEDICINE)						
1. The faculty of a medical school ensure that the core curriculum prepares medical students to function collaboratively on health care teams that include health professionals from other disciplines as they provide coordinated services to patients. These required curricular experiences include practitioners and/or students from the other health professions (p. 13).				x		
OCCUPATIONAL THERAPY						
1. A report that documents and critically reflects upon the inclusive educational methods (including fieldwork education) and their consistency with the educational and professional conceptual frameworks including interprofessional education and practice (p. 17).				x		x
2. Academic and fieldwork education components incorporate interprofessional education (p. 19).				x		x
3. A report that documents the IPE activities and experiences integrated in the occupational therapy program. The report should describe the program offerings, and include considerations of space, human and learning resources required to deliver IPE (p. 19).				x	x	

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
PHARMACY						
1. Students demonstrate practice-readiness that enables them to provide patient care as a collaborative member of a care team before starting culminating direct patient care required practice experiences (p. 7).			x			x
2. The professional degree program in pharmacy has a minimum of four academic years, or the equivalent number of hours or credits, including a series of core courses, practice experiences and interprofessional experiences that support educational outcomes (p. 9).				x		x
3. The Faculty ensures that the professional program includes diversity of required and elective courses, practice experiences, and intra- and inter-professional educational experiences that incorporate different levels of patient acuity, and an organized progression in the level of expected performance that supports growth in students' capabilities to meet educational outcomes (p. 10).				x		x
4. The curriculum addresses outcomes and competencies to develop graduates that are capable of carrying out care provider, communicator, collaborator, leader manager, health advocate, scholar and professional roles (p. 10).				x		x
5. The curriculum includes required intra- and interprofessional learning experiences, offered throughout the professional program, to enable a graduate to provide patient care as a collaborative member of a care team (p. 12).				x		
6. Experiences address content to develop the expected competencies for intra- and interprofessional care and collaborative practice. Experiences are integrated throughout the professional program (p. 12).				x		
7. The University has integrated and endorsed the concept of interprofessional education and collaboration in practice (p. 16).	x					

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
PHARMACY (continued)						
8. The University enables relationships that support interprofessional learning (p. 16).	x					
9. Organizational structures and processes are in place to support interprofessional education (p. 16).	x					
10. Interprofessional education is recognized as a valuable teaching responsibility within the academic health sciences (p. 17).		x				
11. Interprofessional education and collaborative practice is embedded in Faculty policy and/or strategic plans (p. 20).	x					
12. The policy and/or strategic plan includes the evaluation of interprofessional education (p. 20).	x					
13. The Faculty works collaboratively with practice sites and other health professions programs to make intra- and/or inter-professional care/collaborative practice environments available to student pharmacists (p. 27).	x					
PHYSIOTHERAPY						
1. The program prepares students to use effective communication to develop professional relationships with clients, families, team members, care providers, and other stakeholders (p. 29).				x		
2. The program prepares students for collaborative practice to support quality client-centred care (p. 30).				x		
3. Establish and maintain interprofessional relationships, which foster effective collaborative practice (p. 30).			x			
4. The program prepares students to: demonstrate an understanding of and respect the roles, responsibilities, and differing perspectives of team members including clients (p. 30).				x		

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
PHYSIOTHERAPY (continued)						
5. The program prepares students to: consult and share relevant information with clients, other health professionals, and all relevant individuals or groups in a timely manner (p. 30).				x		
6. The program prepares students to: promote active and informed shared decision making (p. 30).				x		
7. The program prepares students to: foster collaboration with relevant others (p. 30).				x		
8. Prevent, manage, and resolve conflict related to client-centred care (p. 30).			x			
9. The program prepares students to: demonstrate a respectful attitude towards colleagues and members of an interprofessional team, including clients (p. 30).				x		
10. The program prepares students to: identify the issues that may contribute to the development of conflict between the physiotherapist and client or among team members (p. 30).				x		
11. The program prepares students to: address conflicts in an appropriate and timely manner (p. 30).				x		
12. Work collaboratively to identify, respond to, and promote the health needs and concerns of clients (p. 31).			x			
13. The program prepares students to: collaborate with clients and other care providers to understand, identify, and promote the health and physiotherapy needs and concerns of clients (p. 31).				x		
14. The program prepares students to: understand the limits and opportunities in the practice setting to address health issues, and work collaboratively to develop strategies to optimize client care (p. 31).				x		x

Accountable Statement	Organizational commitment	Faculty	Students	Educational program	Resources	Practice-based
PSYCHOLOGY						
1. Intervention in clinical neuropsychology includes: consultation to the community and other institutions (e.g., schools, other health or residential care facilities) and inter-professional teams about the cognitive and psychological functioning and needs of patients with neurological disorders (p. 35).			x			x
SOCIAL WORK						
1. Social work students are prepared for interprofessional practice, community collaboration and team work (p.12).			x			

Appendix 7 *Participating Health and Social Care Professions, by Post-Secondary Institution*

Health and Social Care Profession	UBC	UofM	UofT	UdeM
1. Audiology (MSc)	X			X
2. Clinical Psychology (MA, PhD)	X			
3. Dental Hygiene (Dip[DH])	X	X		
4. Dentistry (DDS/DMD)	X	X	X	X
5. Food, Nutrition, and Health (BSc)	X			X
6. Genetic Counselling (MSc)	X			
7. Health and Exercise Sciences (BSc)	X			
8. Medical Radiation Sciences (BSc)			X	
9. Medicine (MD)	X	X	X	X
10. Midwifery (BSc/BMid)	X	X		
11. Nursing (BN/BScN)	X	X	X	X
12. Occupational Therapy (MSc/MOT)	X	X	X	X
13. Optometry (OD)				X
14. Pharmacy (PharmD)	X	X	X	X
15. Physical Therapy (MSc/MPT)	X	X	X	X
16. Physician Assistant (BScPA/MPAS)		X	X	
17. Professional Kinesiology (BSc, MSc)			X	X
18. Psychoeducation (BSc)				X
19. Respiratory Therapy (BRT)		X		
20. Social Work (BSW, MSW)	X	X	X	X
21. Speech-Language Pathology (MSc)	X		X	X
Total	**15**	**11**	**11**	**13**

Notes: BMid, Bachelor of Midwifery; BN, Bachelor of Nursing; BRT, Bachelor of Respiratory Therapy; BSc, Bachelor of Science; BScN, Bachelor of Science in Nursing; BSW, Bachelor of Social Work; Dip(DH), Diploma in Dental Hygiene; DDS, Doctor of Dental Surgery; DMD, Doctor of Dental Medicine; G, graduate; MA, Master of Arts; MD, Doctor of Medicine; MOT, Master of Occupational Therapy; MPAS, Master of Physician Assistant Studies; MPT, Master of Physical Therapy; MSc, Master of Science; OD, Doctor of Optometry; PharmD, Doctor of Pharmacy; PhD, Doctor of Philosophy; UBC, University of British Columbia; UdeM, Université de Montréal; UofM, University of Manitoba; UofT; University of Toronto.

Appendix 8 *Institution-Specific Policy Documents, Curriculum Reports, and Published Pee-Reviewed Articles*

University of British Columbia

Greenwood, M. (2019). Modelling change and cultural safety: A case study in northern British Columbia health system transformation. *Healthcare Management Forum, 32*(1), 11–14. https://doi.org/10.1177/0840470418807948

Wood, V., Eccott, L., Crowell, P. (2022). iEthics: An interprofessional ethics curriculum. *Pharmacy, 10*(1), 12. https://doi.org/10.3390/pharmacy10010012

University of Manitoba

Fricke, M., Condon, A., Jensen, F., MacDonald, L., Oliver, R & Warden, K. (2019, May 10-13). *Implementing a two year interprofessional education curriculum: Opportunities and lessons learned.* World Physical Therapy Congress, Geneva, Switzerland. https://www.abstractstosubmit.com/wcpt2019/archive/#/viewer/abstract/1425

Grymonpre, R. E., Ateah, C. A., Dean, H. J., Heinonen, T. I., Holmqvist, M. E., MacDonald, L. L., Ready, A. E., & Wener, P. F. (2016a). Sustainable implementation of interprofessional education using an adoption model framework. *Canadian Journal of Higher Education*, *46*(4), 76–93.

Grymonpre, R., Dean, H., James, M., Wener, P., Ready, A.E., MacDonald, L., Holmqvist, M., & Fricke, M. (2016b). Quantifying interprofessional learning in health professional programs: The University of Manitoba experience. *Canadian Journal of Higher Education 46*(4): 94-114.

MacDonald, L., Fricke, M., Condon, A., & Jensen, F. (2018, October 27-29). *Check your ego at the door: Evaluation results of* a longitudinal Interprofessional Collaborative Care Curriculum. 24th Annual Qualitative Health Research Conference, Halifax, NS. https://doi.org/10.1177/1609406918819362

Mendez, L., Brown, C. L., Marsch, N., & Lavallee, M. (2021). "Opened my eyes": Learning from interprofessional engagement with Indigenous communities. Journal of Interprofessional Education and Practice. https://doi.org/10.1016/j.xjep.2021.100478

Office of Interprofessional Collaboration. (2022). *Annual Report: Academic Year 2020–2021*. Rady Faculty of Health Sciences, University of Manitoba. https://umanitoba.ca/health-sciences/sites/health-sciences/files/2022-04/office-of-educational-and-faculty-development-annual-report.pdf

Université de Montréal

Descôteaux, A., Jackson, M., & Vanier, M.-C. (2020). Quand les patients formateurs prennent le relais : transfert d'ateliers sur la collaboration interprofessionnelle en ligne en temps de COVID-19. *Pédagogie Médicale, 21*(4), 215–217. https://doi.org/10.1051/pmed/2020051

Office of Collaboration and Patient Partnership and Interfaculty Operational Committee. (2019). *Competency framework for collaborative practice and patient partnership in health and social services*. Université de Montréal. https://ceppp.ca/ressources/ipcpandpatientpartnershipcompetencyframework_healthandsocialservices-pdf/

Office of Collaboration and Patient Partnership and Interfaculty Operational Committee. (2016). *Référentiel de compétences de la Pratique collaborative et du Partenariat patient en santé et services sociaux. Université de Montréal.* https://medfam.umontreal.ca/wp-content/uploads/sites/16/2018/04/Referentiel-pratique_Collaborative-et-partenariatPatient_sss-28-10-2016.pdf

Raynault, A., Lebel, P., Brault, I., Vanier, M.-C., & Flora, L. (2021). How interprofessional teams of students mobilized collaborative practice competencies and the patient partnership approach in a hybrid IPE course. *Journal of Interprofessional Care, 35*(4), 574-585. https://doi.org/10.1080/13561820.2020.1783217

University of Toronto

Abelson, J., Canfield, C., Leslie, M., Levasseur, M. A., Rowland, P., Tripp, L., Vanstone, M., Panday, J., Cameron, D., Forest, P.-G., Sussman, D., & Wilson, G. (2022). Understanding patient partnership in health systems: Lessons from the Canadian patient partner survey. BMJ Open, 12, e061465. https://doi.org/10.1136/bmjopen-2022-061465

Cioffi, I., Dale, C. M., Murphy, L., Langlois, S., Musa, R., & Stevens, B. (2021). Ten years of interfaculty pain curriculum at the University of Toronto: Impact on student learning. *Pain Reports*, *6*(4), e974. https://doi.org/10.1097/PR9.0000000000000974

Dale, C. F., Cioffi, I., Murphy, L., Langlois, S., Musa, R., & Stevens, B. (2022). Ten-year mixed-method evaluation of prelicensure health professional student self-reported learning in an interfaculty pain curriculum. *Pain Reports, 7*(5), e1030–e1030. https://doi.org/10.1097/PR9.0000000000001030

Langlois, S., & Mehra, K. (2020). Teaching about partnerships between patients and the team: Exploring student perceptions. *Journal of Patient Experience, 7*(6), 1589–1594. https://doi.org/10.1177/2374373520933130

Langlois, S., Childs, R., Kanofsky, S., Lee, A., Stirling, A., Paulenko, T., Brijmohan, A., & Vardy, G. (2017, October 1–4). Assessing readiness for collaborative practice: The Interprofessional Competence Assessment. Collaborating across Borders VI. Banff, Alberta, Canada.

Raveendrakumar, R., Faroze, S., Rojas, D., & Langlois, S. (2021). Interprofessional education and collaborative competency development: A realist evaluation. *Journal of Occupational Therapy Education, 5*(4). https://doi.org/10.26681/jote.2021.050410

Sehlbach, C., & Rowland, P. (2022). Opening up learning conversations: Including patients. *Medical Education, 56*(10), 962–964. https://doi.org/10.1111/medu.14876

Trouvin, A.-P. (2022). "Ten-year mixed method evaluation of prelicensure health professional student self-reported learning in an interfaculty pain curriculum": A view on pain education. *PAIN Reports, 7*(5), p e1031. https://doi.org/10.1097/PR9.0000000000001031

Appendix 9 *Interview Guide for Individual Facilitator/Preceptor Interviews*

Significance of Interprofessional Education

1. How would you define the term *interprofessional education*?
2. How would you describe the importance of interprofessional education?
3. Which professions do you believe should be involved in a given interprofessional education opportunity?
4. How would you describe the desired outcomes from interprofessional education?

Enablers and Barriers

5. Do you feel that you and your colleagues are provided with the adequate development and resources to effectively facilitate interprofessional education?
6. What specific enablers help you facilitate interprofessional education?
7. What specific barriers or challenges hinder your facilitation of interprofessional education?
8. How comfortable were you in facilitating these interprofessional education opportunities?
9. How satisfied are you with how interprofessional collaborative practice is being implemented at your institution?

Integrated Curriculum and Activities

10. What strategies do you employ to 'plant the seeds' of interprofessional education in your students?
11. What didactic/practice-based learning opportunities did you provide to help students attain interprofessional skills?
12. Are there other learning opportunities that you provided to help students attain interprofessional skills?
13. Are there any missed activities in which your students could have been involved?

Outcomes and Way Forward

14. How would you describe your students' takeaways from these experiences?
15. What knowledge and skill set have your students learned from these experiences?
16. Following these interprofessional education experiences, how would you describe your students' preparedness for interprofessional collaborative practice?
17. Is there anything else you would like to discuss?

Appendix 10 *The Exposure Phase, During Which Students are Introduced to Interprofessional Education*

University of British Columbia	University of Manitoba	University of Toronto	Université de Montréal
Students complete online modules and interprofessional small group discussions during synchronous sessions on: • *Interprofessional Professionalism* (1.5 hours); • *Foundations of Ethical Practice* (2.5 hours); • *Indigenous Cultural Safety and Humility* (4 hours). Students also complete an online module* on: • *Ethical Decision-Making* (2 hours). *This module is not IPE; rather, it is designed to support the interprofessional components of this curriculum. Individual professional academic programs are responsible to ensure that their students complete this module at their own discretion.	At the beginning of each Fall and Winter academic term (for a total of four terms), all students attend a synchronous session together. This is followed by three small interprofessional team discussions—two asynchronous and one synchronous—with an overarching focus on the interprofessional competency domains (CIHC, 2010). • In Year 1, learning teams explore *team functioning*, *interprofessional communication*, and *community-centred care* in the context of *population health;* • Year 2 builds on Year 1 with the learning teams exploring *roles and responsibilities*, *shared leadership*, and *interprofessional conflict resolution* contextual to *patient safety*; Towards the end of each academic term, students are required to submit personal written	Students participate in three learning activities: • *Teamwork: Your Future in Healthcare*, during which students are introduced to the professions' diverse roles and responsibilities and to the importance of patients as collaborative team members. Students complete small group discussions, three online modules, with an embedded quiz; • *Roles and Team Dynamics*, during which students work in small interprofessional groups to discuss team dynamics, the scopes of practice and roles of their professions, and review profession involvement as demonstrated by a case study and an interprofessional care management; • *Patient/Client Partnerships in a Team Context*, during which students explore strategies that enable practitioners to	The *Collaboration in Health Sciences I* (CHS-I) course, which is offered in the first Winter academic term, focuses on discovering other professions and the concepts of patient partnerships. • Students individually complete online modules (six hours) to acquire the basic concepts regarding other professions, patient partnerships, and collaborative practice; • Students interview a family member regarding their experience of patient partnership; • Intraprofessional teams complete an assignment to describe their own profession, explore a simple clinical case, and discuss their findings with the larger group; • Small interprofessional teams (n = 5) virtually share results of their previous intraprofessional tasks in

	reflections in response to guiding questions.	include patients/clients as effective collaborative team members, complete a reflective written assignment, and provide feedback to two peers. Further, students participate in *faculty-led learning activities*, which address specific collaborations among some professions educational programs. Examples include: • *Safe Prescribing and Medication Reconciliation*, which involves nursing, medical, and pharmacy students; *Use of Social Media in Communication*, which involves dentistry and medical students.	preparation of group discussions (*n* = 10) and team presentations (*n* = 20) during the IPE session where students exchange their views on patient partnership, other professions and the needs and values of the patient from the case study previously seen in the intraprofessional activity; Students individually complete the ICCAS to assess their competency development.

Notes: ICCAS, Interprofessional Collaborative Competencies Attainment Survey; IPE, interprofessional education.

Appendix 11 *The Immersion Phase, During Which Students are Continually Develop Interprofessional Competencies*

University of British Columbia	University of Manitoba	University of Toronto	Université de Montréal
Students complete online modules and interprofessional small group discussions during synchronous sessions on: • *Collaborative Decision-Making* (2 hours); • *Foundations of Health Informatics* (2 hours); • *Indigenous Cultural Safety: Transforming Care* (2 hours); • *Ethical Decision-Making* (2 hours). Students also complete other online modules* on: • *Indigenous Perspectives of History* (2 hours); • *Indigenous People's Health* (4 hours); • *Transforming Moral Distress into Moral Resilience* (1 hour). *These modules are not IPE; rather, they are designed to support the interprofessional components of this curriculum.	Interprofessional teams engage in simulation-based learning with standardized patients beginning in each of the fall and winter terms in the second year, followed by asynchronous and synchronous team-based discussions using a variety of case studies.	Students participate in four learning activities: • *Collaborating for Quality*, during which students explore strategies to address quality improvement through small interprofessional group discussions; • *Conflict in Interprofessional Life*, during which students explore strategies to effectively manage conflict within their interprofessional teams; • Simulation-based team discussions focused on *palliative care* or in a case-based activity entitled *Appreciating Roles and Collaboration to Improve Care in Head and Neck Cancer (ARCTIC)*; *Inter-Faculty Pain Curriculum* (20 hours over three days; Cioffi et al., 2021), which incorporates small interprofessional group discussions and development of	The *Collaboration in Health Sciences II* (CHS-II) course, which is set in the context of *general care*, focuses on role clarification among professions and with patients. The *Collaboration in Health Sciences III* (CHS-III) course, which brings students together to apply the concepts of IPCP and patient partnership in the context of *palliative care*, focuses on collaborative practice and interprofessional intervention plans. Both courses are based on UdeM's Competency Framework for Collaborative Practice and Patient Partnership in Health and Social Services (CIO-UM & DCPP, 2019) with a focus on four of the eight competencies: • Planning, implementation, and monitoring of care and services; • Clarification of roles; • Conflict prevention/ resolution; • Therapeutic education. During both courses:

Individual professional academic programs are responsible to ensure that their students complete these modules at their own discretion.	interprofessional pain assessment and management plans.	• Students individually complete online modules (4–6 hours each); • Students complete an intraprofessional course where they explore their roles and patient partnerships in different contexts of care or services; • Interprofessional teams (*n* = 5) meet virtually to create a clinical case illustrating their roles and patient partnerships and to write SMART care objectives for their case patient (in CHS-II) and produce an interprofessional care plan (CHS-III); • Students complete an interprofessional session combining two teams of five presenting and discussing their case study to the other team and the two co-facilitators (one practitioner and one patient); Students individually complete the ICCAS to assess their competency development.

Notes: CIO-UM, Interfaculty Operational Committee; DCPP, Office of Collaboration and Patient Partnership; ICCAS, Interprofessional Collaborative Competencies Attainment Survey; IPCP, interprofessional collaborative practice.

Appendix 12 *The Competence Phase, During Which Students Engage in Practice-Based Activities*

University of British Columbia	University of Manitoba	University of Toronto	Université de Montréal
Over the past few years, several elective practice-based IPE initiatives have been implemented but currently are not sustained due to limited funding. Mandatory practice-based IPE opportunities are currently under development with aim of having such initiatives in place by 2024. Elective initiatives include: • *Interprofessional Rural Program of British Columbia* (IRPbc) program, through which interprofessional groups of students lived and learned together in rural communities; Several demonstration projects in practice settings, including St. Paul's Hospital and GF Strong Rehabilitation Centre.	These opportunities are made available by the OIPC in partnership with the community: • A two-week Indigenous community-led interprofessional immersion program, *Ndinawemaaganag (*"all my relations" in Anishinaabemowin); The "Home for the Summer" program provides interprofessional summer employment opportunities for students in rural/remote regions in partnership with the Manitoba Healthcare Providers Network and the rural regional health authorities.	Students complete at least one structured interprofessional placement or three flexible components. During *structured interprofessional placements*, students in interprofessional teams participate over three weeks in two facilitated introductory tutorials, and then continue to meet on regularly, culminating with a group presentation. In *flexible interprofessional placements*, students complete three initiatives: • Interview/shadow a practitioner from another profession to understand their roles and responsibilities; • Analyze their interprofessional interactions and their impacts on patient/client-centred care; Collaborate with one or more practitioners from another profession and then reflect on the factors that enabled and/or hindered the collaboration.	These initiatives are currently informally implemented through partnerships between/among individual professional academic programs. Therefore, they are not organized by the CIO-UM)/DCPP.

Notes: CIO-UM, Interfaculty Operational Committee; DCPP, Office of Collaboration and Patient Partnership; OIPC, Office of Interprofessional Collaboration.

Appendix 13 *Additional Interprofessional Education Opportunities*

University of British Columbia	University of Manitoba	University of Toronto
• *Health Mentors Program* (12 hours implemented over one year; *n* = 300); • *Patient and Community Voices Workshop Series* (one year), through which students learn together and directly from patients and community members through their stories and expertise; • Individual IPE sessions focused on specific topics (e.g., palliative care, HIV/AIDS).	• A *Bioethics* session (two hours) involves first year students enrolled in medicine, physician assistant, and rehabilitation therapy programs; • Senior occupational therapy and senior dental hygiene students working collaboratively to assess and discuss ergonomics in the dental clinic; • Senior physical therapy students teaching senior pharmacy students about measuring mobility aids and in return, the pharmacy students teaching the physical therapy students about the risks of using NSAIDS; • Senior students in nursing practitioner, dental hygiene, and dentistry engaging in IPE activities to address cases in oral systemic health; • *Communities and Collaboration Symposium*, a half-day conference that occurs every May and typically involves a keynote speaker, followed by poster presentations and a session for clinicians; • *Day Shift*, a four-hour simulation-based learning activity conducted with standardized patients and typically involves 60 first-year and second-year students enrolled in nursing, medicine, respiratory therapy, physical therapy, occupational therapy, and pharmacy; • *Poverty Awareness & Community Action: Interprofessional Collaboration for Resource Development and Advocacy*, a collaboration between the OIPC and Community Engaged Learning, where students build a deepened awareness of the impacts of poverty while moving towards skill development related to eliminating barriers, navigating resources, and advocacy (funded by the Government of Canada's *Innovative Work-Integrated Learning Initiative*); • Winnipeg Interdisciplinary Student-run Health (WISH) Clinic, a student-led primary health clinic in Winnipeg's inner city (www.wishclinic.ca).	• 60 approved learning activities are available. For details, see https://www.ipecurriculum.utoronto.ca/Activity). These activities are offered either on campus or in practice settings; • *Interprofessional Health, Arts and Humanities Certificate Program* fosters IPCP through patient partnerships and enables students to employ arts-based modalities to enhance reflection, strengthen interprofessional dialogue, and gain deeper understanding of health, illness, and suffering; • *Senior design projects*, through which student groups develop collaborative leadership; • *Health Mentor Program* (three weeks), a blended learning program through which students participate in two interprofessional team interviews with patients.

Notes: OIPC, Office of Interprofessional Collaboration. The Université de Montréal does not currently offer any additional opportunities.

Appendix 14 *Ethics Approval*

Western Research

Date: 11 March 2022

To: Dr. Anton Puvirajah

Project ID: 120360

Study Title: Students and faculty perceptions of interprofessional education curriculum

Short Title: IPE Multiple Case Study

Application Type: NMREB Initial Application

Review Type: Delegated

Full Board Reporting Date: 01/Apr/2022

Date Approval Issued: 11/Mar/2022 18:41

REB Approval Expiry Date: 11/Mar/2023

Dear Dr. Anton Puvirajah

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the above mentioned study, as of the date noted above. NMREB approval for this study remains valid until the expiry date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

This research study is to be conducted by the investigator noted above. **All other required institutional approvals and mandated training must also be obtained prior to the conduct of the study.**

Documents Approved:

Document Name	Document Type	DocumentDate	Document Version
2.5 Interview Guide for Individual Facilitator, Preceptor Interviews	Interview Guide		
2.5 Focus Groups Interview Guide	Focus Group(s) Guide		
4.1.6f Follow-up recruitment email - Facilitators & Preceptors	Recruitment Materials	18/Feb/2022	1
4.1.6f Follow-up recruitment email - Students (Université de Montréal)	Recruitment Materials	18/Feb/2022	1
4.1.6f Follow-up recruitment email - Students (University of British Columbia)	Recruitment Materials	18/Feb/2022	1
4.1.6f Follow-up recruitment email - Students (University of Manitoba)	Recruitment Materials	18/Feb/2022	1
4.1.6f Follow-up recruitment email - Students (University of Toronto)	Recruitment Materials	18/Feb/2022	1
4.1.6f Recruitment email - Facilitators & Preceptors	Recruitment Materials	18/Feb/2022	2
4.1.6f Recruitment email - Students (Université de Montréal)	Recruitment Materials	18/Feb/2022	2
4.1.6f Recruitment email - Students (University of British Columbia)	Recruitment Materials	18/Feb/2022	2
4.1.6f Recruitment email - Students (University of Manitoba)	Recruitment Materials	18/Feb/2022	2
4.1.6f Recruitment email - Students (University of Toronto)	Recruitment Materials	18/Feb/2022	2
Facilitators & Preceptors - 1. Participant Eligibility	Online Survey	18/Feb/2022	1
University of Manitoba (Students) - 1. Participant Eligibility	Online Survey	18/Feb/2022	1
University of Montreal (Students) - 1. Participant Eligibility	Online Survey	18/Feb/2022	1

University of British Columbia (Students) - 1. Participant Eligibility	Online Survey	18/Feb/2022	1
University of Toronto (Students) - 1. Participant Eligibility	Online Survey	18/Feb/2022	1
Facilitators & Preceptors - 3. Participant Availability	Online Survey	05/Mar/2022	2
University of British Columbia (Students) - 3. Participant Availability	Online Survey	05/Mar/2022	2
University of Manitoba (Students) - 3. Participant Availability	Online Survey	05/Mar/2022	2
University of Montreal (Students) - 3. Participant Availability	Online Survey	05/Mar/2022	2
University of Toronto (Students) - 3. Participant Availability	Online Survey	05/Mar/2022	2
Facilitators & Preceptors - 2. Letter of Information and Form of InformedConsent	Written Consent/Assent	07/Mar/2022	3
University of British Columbia (Students) - 2. Letter of Information and Form of Informed Consent	Written Consent/Assent	07/Mar/2022	3
University of Manitoba (Students) - 2. Letter of Information and Form ofInformed Consent	Written Consent/Assent	07/Mar/2022	3
University of Montreal (Students) - 2. Letter of Information and Form ofInformed Consent	Written Consent/Assent	10/Mar/2022	4
University of Toronto (Students) - 2. Letter of Information and Form ofInformed Consent	Written Consent/Assent	10/Mar/2022	4

Documents Acknowledged:

Document Name	Document Type	Document Date	Document Version
TRAC Review	Technology Review document	03/Feb/2022	1
Facilitators & Preceptors - 1. Participant Eligibility	Screening Form/Questionnaire	18/Feb/2022	1
University of British Columbia (Students) - 1. Participant Eligibility	Screening Form/Questionnaire	18/Feb/2022	1
University of Manitoba (Students) - 1. Participant Eligibility	Form/Questionnaire	18/Feb/2022	1
University of Montreal (Students) - 1. Participant Eligibility	Form/Questionnaire	18/Feb/2022	1
University of Toronto (Students) - 1. Participant Eligibility	Form/Questionnaire	18/Feb/2022	1

No deviations from, or changes to the protocol should be initiated without prior written approval from the NMREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Ms. Kelly Patterson, Ms. Zoë Levi, Research Ethics Officer on behalf of Dr. Randal Graham, NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

Curriculum Vitae

Mohammad B. Azzam

EDUCATION

Doctor of Philosophy, Curriculum Studies — Fall 2019 – June 2023
Western University, London, ON., N6A 3K7, Canada
Dissertation: The Influence of Interprofessional Education on Interprofessional Collaborative Practice: A Pan-Canadian Context
Supervisor: Dr. Anton Puvirajah

Master of Science, Anatomical Sciences — Fall 2017 – Fall 2018
Queen's University, Kingston, ON., K7L 3N6, Canada
Dissertation: Retrieval practice for learning leading to better long-term retention and improved student performance in anatomical education
Supervisor: Dr. Ronald Easteal

Honours Bachelor of Science, Life Sciences — Fall 2013 – Winter 2017
Queen's University, Kingston, ON., K7L 3N6, Canada

CERTIFICATES

2022 Exploring and Interviewing for Careers in Teaching (EICT), Western University
Western Certificate in University Teaching and Learning (WCUTL), Western University
Teaching Mentor Program (TMP) Certificate, Western University
Advanced Teaching Program (ATP) Certificate, Western University
2021 Mitacs Training Certificate, Mitacs

HONOURS AND AWARDS

2022/2023	Ontario Graduate Scholarship ($15,000)
2021/2022	Western Graduate Research Scholarship ($9,896)
	Ontario Graduate Scholarship ($15,000)
	Western Graduate Research Scholarship ($9,896)
2020/2021	MITACS Research Training Award ($6,000)
	Research Development Fund ($5,000)
	Western Graduate Research Scholarship ($9,896)
2019/2020	Western Graduate Research Scholarship ($9,896)
2018/2019	Health Sciences Graduate Growth Funding ($1,715)
	Queen's University Graduate Award ($2,000)
2017/2018	Health Sciences Graduate Growth Funding ($2,715)
	Queen's University Graduate Award ($4,530)
2014/2015	Queen's University Principal's Scholarship ($4,000)
2013/2014	Queen's University Principal's Scholarship ($4,000)

WORK EXPERIENCE

Winter 2023 **Assistant Professor**, Human Embryology, Western University
Supervisor: Rachel Forrester-Jones, Director, School of Health Studies
HEALTHSCI 4320B: Human Embryology

- Prepared and developed course materials and classroom activities
- Maintained the course in the learning management system
- Set, marked, and proctored all examinations

2022/2023 **Teaching Assistant**, Senior Biology Education, Western University
Supervisor: Kelly Zuber, Adjunct Faculty, Faculty of Education
EDUC 5202: Curriculum & Pedagogy in Senior Biology

- Prepared and developed course materials and classroom activities
- Facilitated small group learning and contributed to class discussions
- Marked written assignments and reflections

2021/2022 **Lecturer**, Anatomy (Medicine), Western University
Supervisor: Charys Martin, Assistant Professor, Anatomy & Cell Biology
MEDS 1137 for first and second-year anatomy courses in medicine

- Prepared course materials, taught classes, and consulted students
- Facilitated virtual & in-person labs & small group learning sessions
- Administered, proctored, & marked written and bell-ringer exams

2021/2022 **Lecturer**, Anatomy (Dentistry), Western University
Supervisor: Timothy Wilson, Associate Professor, Anatomy & Cell Biology
DENTS 5160/5185/5186 for first-year anatomy courses in dentistry

- Prepared course materials, taught classes, and consulted students
- Facilitated virtual & in-person labs & small group learning sessions
- Administered, proctored, & marked written and bell-ringer exams

2021/2022 **Teaching Assistant**, General Science Education, Western University
Supervisor: Maureen O'Neil, Adjunct Faculty, Faculty of Education
EDUC 5223: Curriculum & Pedagogy in Intermediate/Senior Science

- Prepared and developed course materials and classroom activities
- Facilitated small group learning and contributed to class discussions
- Marked written assignments and reflections

2020/2021 **Teaching Assistant**, Anatomy (Medicine), Western University
Supervisor: Charys Martin, Assistant Professor, Anatomy & Cell Biology
MEDS 1137 for first and second-year anatomy courses in medicine

- Facilitated virtual & in-person labs & small group learning sessions
- Proctored & marked written and bell-ringer tests and exams

2020/2021 **Teaching Assistant**, Anatomy (Dentistry), Western University
Supervisor: Timothy Wilson, Associate Professor, Anatomy & Cell Biology
DENTS 5160/5185/5186 for first-year anatomy courses in dentistry

- Facilitated virtual & in-person labs & small group learning sessions
- Proctored & marked written and bell-ringer tests and exams

WORK EXPERIENCE [continued]

2019/2020 **Teaching Assistant**, Anatomy (Physical Therapy), Western University
Supervisor: Brian Allman, Associate Professor, Anatomy & Cell Biology
ANAT 9501: Functional Human Anatomy

- Facilitated virtual & in-person labs & small group learning sessions
- Proctored & marked written and bell-ringer tests and exams

2017/2019 **Teaching Assistant**, Anatomy, Queen's University
Supervisor: Leslie MacKenzie, Associate Professor, Biomedical Sciences

- ANAT 100: Anatomy of the Human Body (online; undergraduate)
- ANAT 101: Introductory Human Anatomy (undergraduate)
- ANAT 315: Human Musculoskeletal System (undergraduate)

PUBLICATIONS

Books and Book Chapters

Azzam, M., & Easteal, R. A. (2019). *Mammalian embryonic development*. Department of Biomedical and Molecular Sciences, Queen's University.

Girard, M.-A., Alrumaihi, N., & **Azzam, M. B.** (In Press). Interprofessional education: Accreditation standards, regulatory policies, and legal structures. In M. Alnaami, D. Alqahtani, E. A. Alfaris, H. M. Abdulghani, & C. A. Mohammed (Eds.), *Novel health interprofessional education program: Strategy and structure manual*. Springer.

Peer-Reviewed Publications

Azzam, M. B., & Easteal, R. A. (2021a). Pedagogical strategies for the enhancement of medical education. *Medical Science Educator*. https://doi.org/10.1007/s40670-021-01385-w

Azzam, M. B., & Easteal, R. A. (2021b). Retrieval practice for improving long-term retention in anatomical education: A quasi-experimental study. *Medical Science Educator*. https://doi.org/10.1007/s40670-021-01298-8

Azzam, M. B., & Puvirajah, A. (In Press). Situating interprofessional education curriculum within a theoretical framework for productive engaged learning: Integrating epistemology, theory, and competencies. *Journal of Research in Interprofessional Practice and Education*.

Azzam, M. B., Drynan, D., Fricke, M., Langlois, S., MacDonald, L., Vanier, M.-C., & Puvirajah, A. (In Press). A comparative analysis of integrated interprofessional education curriculum models at four Canadian post-secondary institutions. *Journal of Research in Interprofessional Practice and Education*.

Azzam, M. B., Girard, M.-A., Andrews, C., Bilinski, H., Connelly, D. M., Gilbert, J. H. V., Newton, C., & Grymonpre, R. E. (2022). Accreditation as a driver of interprofessional education: The Canadian experience. *Human Resources for Health, 20*(65). https://doi.org/10.1186/s12960-022-00759-4

Peer-Reviewed Publications [continued]

Azzam, M. B., Puvirajah, A., Girard, M., & Grymonpre, R. E. (2021). Interprofessional education-relevant accreditation standards in Canada: A comparative document analysis. *Human Resources for Health*, 19, 66. https://doi.org/10.1186/s12960-021-00611-1

Azzam, M. B., Ranieri, J., & Puvirajah, A. (2022). Interprofessional education in prelicensure health and social care professions education: A systematic review. *Health, Interprofessional Practice and Education, 4*(3), eP2186. http://doi.org/10.7710/2641-1148.2186