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A Case Study of Organizational and Curricular Attributes for Interprofessional Education: A Model for Sustainable Curriculum Delivery

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Article abstract

Background: 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.

Methods and Findings: This qualitative case study explores 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) projects. Analyses of the data resulted in five attributes: 1) central administrative unit, 2) longitudinal and integrative program, 3) theoretically informed curriculum design, 4) student-centred pedagogy, and 5) patient/client-oriented approach.

Conclusions: 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.

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A Case Study of Organizational and Curricular Attributes for Interprofessional Education: A Model for Sustainable Curriculum Delivery

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Abstract

Background: 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.

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Conclusions: 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.

Keywords: interprofessional education, integrated curriculum, prelicensure education

Introduction

More than a century ago, the Flexner report [1] 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

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practice settings, and engaging practitioners in both teaching and research. These recommendations, which were effectuated by medical and other health and social care (HASC)[1] 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, with students of diverse HASC professions graduating 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 [2]. Regrettably, this approach may have permitted some unqualified and underqualified students to graduate and enter the workplace [3], 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 twenty-first 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[2] in problem-solving, decision-making, and effective communication and collaboration are demonstrated and evidenced in practice-based clinical settings [3,4]. 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 [5], transformative learning [6], and adult learning theories [7]. 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 [3,4].

Background

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 [8] specifies that graduating physicians are required to demonstrate proficiency in seven overarching competency domains: *medical expert*, *communicator*, *collaborator*, *leader*, *health advocate*, *scholar*, and *pro-*

fessional. While most 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* [9], the National Physiotherapy Advisory Group's (NPAG) *Competency Profile for Physiotherapists in Canada* [10], the Federation of Dental Hygiene Regulators of Canada's (FDHRC) *Entry-to-Practice Canadian Competencies for Dental Hygienists* [11], and the *Competencies for Occupational Therapists in Canada* [12] 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" ([13], 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 [14,15]. 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 [16–20].

According to the WHO's Framework for Action on Interprofessional Education & Collaborative Practice [21] and the Canadian Interprofessional Health Collaborative's (CIHC) National Interprofessional Competency Framework [22], 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 faculties affiliated with these programs [23].

According to the Accreditation of Interprofessional Health Education (AIPHE) projects[3] [24,25] and the Health Professions Accreditors Collaborative [26], IPE must be *sustainably* developed, implemented, and evaluated along a continuum. This involves addressing all five accreditation standards domains (Table 1) and thereby enabling students to effectively develop and translate their interprofessional capabilities over time and into practice [28–30].

Table 1: Accreditation standards domains identified in the Accreditation of Interprofessional Health Education projects [24,25]

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 [27].

Regrettably, Gilbert, Girard, Grymonpre, Lackie, and Langlois [31] recently showed that although most 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, New, George et al. [32] and Boshoff, Murray, Worley, and Berndt's [33] 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 [31–33].

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 [24,25] and sustainably deliver IPE by embedding interprofessional opportunities within their HASC professional education programmatic structures and curricula.[4] 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?*

Methods

This qualitative case study [34] 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.

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), Université de Montréal (UdeM), and University of Toronto (UofT). Collectively, more than 4,700 students in the same year level enrolled in 21 diverse HASC professional education programs (see Appendix 1) 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 percent of all participants in the IPE curriculum.

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 [35]. 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 2). 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) using Zoom Web Conferencing [36] with the coordinators of their respective office/centre for IPE (Table 2) 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 article 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.

Table 2: Offices/centres for interprofessional education at participating institutions

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

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

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 [37]. MA and AP inductively analyzed the data [38,39] to generate relevant themes [40], and further deductively analyzed the data through the AIPHE projects' [24,25] five accreditation standards domains to reveal the extent to which IPE delivery at these institutions is addressed across these domains (see Table 1). 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.

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). The authors 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 [40] about the delivery of IPE at these post-secondary institutions (Figure 1). A report and discussion of the deductive analyses and implications within each of the inductively generated themes is provided.

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 [24,25] and corresponds with the Black, Romito, Pfeifle, and Blu's [41] emphasis on sustaining IPE programming through institutional infrastructure. The four institutions have established centralized administrative units (see Table 2) that coordinate the interfaculty/inter-collegiate and inter-program relationships, allocation of adequate

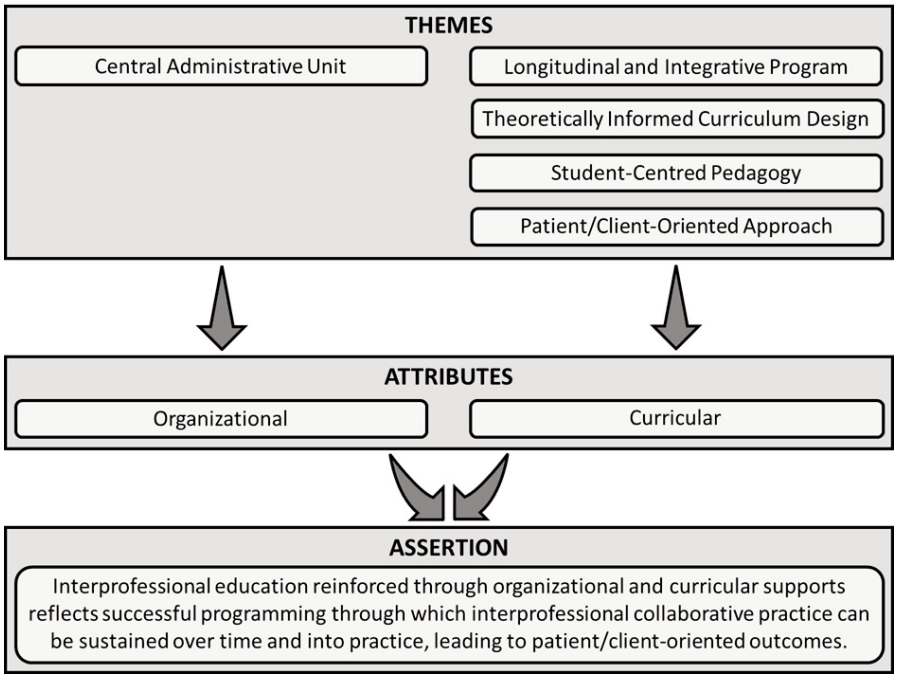

Figure 1: Coding scheme highlighting our inductive themes, attributes, and assertion

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 [23–25,42,43].

These centralized administrative units are also responsible for leading professional development courses/programs, each lasting between two hours and a few days. At UofT, for instance, the Educating Health Professionals in Interprofessional Care (ehpic^{TM}) 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.

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 [28].

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 [29,30]. 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, University of Montréal 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, University of Toronto facilitator)

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 [21,22,44] 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 [8]. Further, the IPE opportunities are created using the guiding principles of several social constructivist learning theories and conceptual frameworks (Table 3). 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 [28]. Hence, this lens enables curriculum developers to design and implement opportunities for students to "learn with, from and about each other" ([13], 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 [58].

Table 3: Theoretical foundations and conceptual frameworks used

Theoretical Foundations
Social constructivism [5]
Transformative learning [6]
Adult learning theory [7]
Contact theory [45]
Pragmatic complexity theory [46]
Conceptual Frameworks
NCCIH's Framework for Structural Competency [47]
Framework for Action on Interprofessional Education & Collaborative Practice [21]
National Interprofessional Competency Framework [22]
Interprofessional Education for Collaborative Patient-Centred Practice [23]
Kirkpatrick's Model for Program Evaluation [46], as adapted by Barr et al. [49]
Competency Framework for Collaborative Practice and Patient Partnership in Health and Social Services [50 (French original version), 51 (English translation)]
Relationship-Centred Care Framework [52]
Population Health Promotion Framework [53]
Framework for Interprofessional Leadership [54]
National Collaborating Centre for Indigenous Health's Framework for Anti-Racism [55]
Patient Safety Competencies [56]
Framework for Structured Reflection [57]

The IPE opportunities comprised of a series of structured, interactive IPE encompassing 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]" [59, 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 [24,25] *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:

> 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, University of Montréal 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 [48], as adapted by Barr, Freeth, Hammick, Koppel, and Reeves [49]. This logical theoretical linkage between *what is designed* and *what is evaluated* is indicative of well-defined intended learning outcomes [58] 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 [60–63] using, for instance, the Interprofessional Socialization and Valuing Scale (ISVS) [64]. 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 ICAR [65]. Lastly, UofT conducts realist evaluations of their curriculum (e.g., [66]) and has stu-

dents evaluate each core and elective IPE activity (e.g., [66,68]). 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.

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*. This theme aligns well with the *students* domain identified through AIPHE [24,25]. 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 [21,22]. At UofT, for instance, the Inter-Faculty Pain Curriculum (see [67, 69]) 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 [70] 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 [71]. 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 [72,73]. In so doing, this approach employs adult learning theory [7], contact theory [45], pragmatic complexity theory [46], and transformative learning [6]. 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 3 for details).

Additionally, the four institutions utilize a multitude of formative and summative assessment methods. For instance, students at UofM are graded for their par-

ticipation (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 [74]. 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, University of British Columbia facilitator)

Similarly, students at UdeM individually complete the Interprofessional Collaborative Competencies Attainment Survey (ICCAS) [75] 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 [76] and the Interprofessional Collaborator Assessment (IPCA) [77], 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[5] has been recognized to be one of the most important factors for effective teamwork [78]. More specifically within the context of IPE, psychologically safe environments are crucial to facilitating richer student participation and proficiency in interprofessional competency domains [22] by diminishing the negative effects of power dynamics and hierarchical and stereotypical structures that are historically predominant in the HASC professional culture [79–81]. 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.

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 [82,83], leading to improved patient/client-centred outcomes that can be sustained over time and into practice [42,84]. The formation of these communities of practice are typically situ-

ated within the cultural identities of the local communities. For instance, UofM offers Indigenous, community-led IPE immersion programs (e.g., [85]), guided by the National *Collaborating Centre* for Indigenous Health's (NCCIH) Framework for Anti-Racism [55], 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 [86–90]), 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:

> 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 centre of our decision-making.

This approach to HASC delivery centralizes the patient/client as the subject of attention [91], 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" ([22], 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 [89,92–94]. 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.

Assertion: An organizational-curricular model for sustainable interprofessional education

The five common attributes showcased in this study are evidenced to address aspects spanning the five accreditation standards domains identified by the AIPHE projects [24,25]. In so doing, the authors 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 [42,84]. 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, the authors propose a model leading to sustainable IPE that manifests the enactment of AIPHE's domains through the organizational and curricular attributes reflected in these findings (Figure 2).

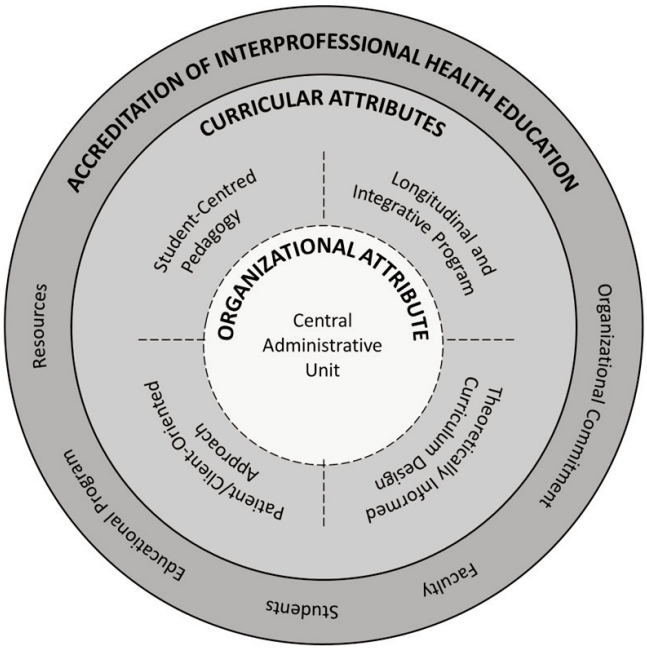

Figure 2: An organizational-curricular model for sustainable interprofessional education

Limitations

There are several limitations to this study. First, the authors 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.

Conclusion

This 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, Ohtake, Bennie et al.'s recently published mixed methods survey study, which examined organizational structures of IPE programs in the United States [95]. 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 this data are also supported by the research literature as being essential for delivering sustainable IPE and attaining improved patient/client-oriented outcomes [42,84]. Further, these attributes complement the accreditation standards domains identified in the AIPHE [24,25] projects 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 this article's 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.

Notes

1. The World Health Organization [96] posits that the health and social care professions comprise professions 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).
2. According to Frank et al. [3], a competency is "an observable ability of a [HASC] professional, integrating multiple components such as knowledge, skills, values, and attitudes."
3. Through the AIPHE projects, IPE terminology was developed and embedded in the accreditation standards of major HASC professional education programs in Canada.
4. Fish and Coles [97] 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."
5. According to Edmondson [98], 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."

Abbreviations

ACFD, Association of Canadian Faculties of Dentistry
ACOTRO, Association of Canadian Occupational Therapy Regulatory Organizations
ACOTUP, the Association of Canadian Occupational Therapy University Programs

AIPHE, Accreditation of Interprofessional Health Education
CAIPE, Centre for the Advancement of Interprofessional Education
CAOT, Canadian Association of Occupational Therapists
CIHC, Canadian Interprofessional Health Collaborative
ehpic™, Educating Health Professionals in Interprofessional Care
FDHRC, Federation of Dental Hygiene Regulators of Canada
HASC, health and social care
ICAR, Interprofessional Collaborative Assessment Rubric
ICCAS, Interprofessional Collaborative Competencies Attainment Survey
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
NPAG, National Physiotherapy Advisory Group
UBC, University of British Columbia
UofM; University of Manitoba
UdeM, Université de Montréal
UofT, University of Toronto
WHO, World Health Organization

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Mohammad B. Azzam: Conceptualization, data curation, formal analysis, methodology, writing, reviewing, and editing the manuscript, and creation of figures. Donna Drynan: Conceptualization, methodology, validation, and reviewing and editing the manuscript. Moni Fricke: Conceptualization, methodology, validation, and reviewing and editing the manuscript. Sylvia Langlois: Conceptualization, methodology, validation, and reviewing and editing the manuscript. Laura MacDonald: Conceptualization, methodology, validation, and reviewing and editing the manuscript. Marie-Claude Vanier: Conceptualization, methodology, validation, and reviewing and editing the manuscript. Anton Puvirajah: Conceptualization, methodology, supervision, and reviewing and editing the manuscript.

Appendix 1

Table 1: 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**	**13**	**11**	**11**

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

Appendix 2

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Appendix 3

Table 1: 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 hrs); • *Foundations of Ethical Practice* (2.5 hrs); • *Indigenous Cultural Safety and Humility* (4 hrs). Students also complete an online module* on: • *Ethical Decision-Making* (2 hrs). *This module is not IPE; rather, it is designed to support the interprofessional components of this curriculum. Individual HASC professional academic programmes 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 reflections in response to guiding questions.	Students participate in three learning activities: • *Teamwork: Your Future in Healthcare,* during which students are introduced to HASC 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 HASC 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 HASC practitioners to include patients and family members 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 HASC professions educational programmes. 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.	The *Collaboration in Health Sciences I* (CHS-I) course, which is offered in the first Winter academic term, focuses on discovering other HASC 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 then discuss their findings with the larger group; • Small interprofessional teams ($n = 5$) virtually share results of their previous intraprofessional tasks in 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: HASC, health and social care; ICCAS, Interprofessional Collaborative Competencies Attainment Survey; IPE, interprofessional education

Appendix 3

Table 2: The Immersion Phase, during which students 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 hrs); • *Foundations of Health Informatics* (2 hrs); • *Indigenous Cultural Safety: Transforming Care* (2 hrs); • *Ethical Decision-Making* (2 hrs). Students also complete other online modules* on: • *Indigenous Perspectives of History* (2 hrs); • *Indigenous People's Health* (4 hrs); • *Transforming Moral Distress into Moral Resilience* (1 hr). *These modules are not IPE; rather, they are designed to support the interprofessional components of this curriculum. Individual HASC professional academic programmes are responsible to ensure that their students complete these modules at their own discretion.	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 hrs over three days; Cioffi et al., 2021), which incorporates small interprofessional group discussions and development of interprofessional pain assessment and management plans.	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 healthcare and social services; • Clarification of role and responsibilities; • Conflict prevention and resolution; • Therapeutic education and health education. During both courses: • Students individually complete online modules (4 to 6 hrs for each course); • Students complete an intraprofessional course where they explore their professional role and patient partnership in different contexts of care or services; • Interprofessional teams ($n = 5$) meet virtually to create a clinical case illustrating their professional 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 HASC 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; HASC, health and social care; ICCAS, Interprofessional Collaborative Competencies Attainment Survey; IPCP, interprofessional collaborative practice

Appendix 3

Table 3: 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) programme, 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 HASC 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 are placed in interprofessional teams within a clinical care unit and participate over three weeks in two facilitated introductory tutorials, and then continue to meet on a regular basis, culminating with a patient-themed group presentation. During *flexible interprofessional placements,* students complete three initiatives: • Interview and/or shadow a HASC practitioner from another profession to understand their roles and responsibilities; • Observe, participate in, and analyze interprofessional interactions and their impacts on patient-centred care; • Collaborate with one or more HASC 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 HASC professional academic programmes. Therefore, they are not organized by the CIO-UM/DCPP.

Notes: CIO-UM, Interfaculty Operational Committee; DCPP, Office of Collaboration and Patient Partnership; HASC, health and social care; OIPC, Office of Interprofessional Collaboration