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Design, Validation and User Experience of the Faculty Development Interprofessional Education for Interprofessional Collaborative Practice (IPE-4-IPCP) Online Learning Modules

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Abstract

Faculty development is significant in facilitating interprofessional education (IPE), yet faculty often have limited training. Distinct from previous work evaluating an Introductory Module for staff, students and health care professionals; this paper describes the design, validation and user experience of four Faculty Development Interprofessional Education for Interprofessional Collaborative Practice (IPE-4-IPCP) online learning modules. Multi-methods research conducted at a health institute in QLD, Australia in 2022. An expert panel (n=5) and health faculty (n=8) assessed content and face validity. User group experience was explored qualitatively via focus groups. Content validity indices were all >0.8 indicating that content was appropriate. Agreement on all scales exceeded 75% for face validation. Findings from focus groups suggest that the four IPE-4-IPCP modules reinforced current faculty practices, taught new concepts, used language that was inclusive and will assist faculty to implement IPE in their context. Carefully designed online learning modules can be an effective way to engage and support faculty involved in design, implementation, assessment and evaluation of IPE experiences.

Keywords: education, faculty development, health workforce, interprofessional collaborative practice, interprofessional education, online learning

Introduction

Over three decades ago, the World Health Organization (WHO) recommended that Interprofessional Education (IPE) and Interprofessional Collaborative Practice (IPCP) should be included at all phases of education (undergraduate, postgraduate and continuing professional development) for the health

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workforce (World Health Organization, 1988). In addition, accreditation and practice standards for health professionals mandate that students and health professionals demonstrate competency in IPE and IPCP (Bogossian & Craven, 2021). Achieving these goals requires deliberate, focussed IPE and IPCP teaching and learning opportunities with sufficiently trained faculty to deliver. Faculty development and preparation are significant factors in facilitating IPE and IPCP activities (Orsini et al., 2021; Steinert, 2005). Despite this, faculty responsible for developing and delivering IPE learning experiences often have limited training in IPE (Abu-Rish Blakeney, 2016; Hayward et al., 2021). Limited faculty development can lead to faculty concerns regarding their own preparedness to deliver IPE and IPCP learning experiences (Hall & Zierler, 2015) as well as difficulty in articulating a "clear conceptual understanding of the core IPE and IPCP principles" (Egan-Lee et al., 2011) for their learners.

The WHO identify factors that can influence the success of IPE initiatives, including faculty training, institutional support and IPE champions (WHO, 2010). Faculty training for IPE should be targeted and include theories underpinning IPE and IPCP as well as teaching practice (Buring et al., 2009). A recent review of IPE design interventions reported that very few were underpinned by learning theories and failed to articulate key instructional design elements including learning objectives (Bogossian, 2022). Regardless, research suggests that interventions for faculty development of IPE and IPCP can achieve a commitment to change (Christofiols, 2015), increased engagement with IPE (Shrader, 2016) and development of acquisition of skills (Steinart et al., 2016).

It is important to note that much of the literature on faculty development in IPE and IPCP tends to focus on health faculty *within* academic institutions, reporting face-to-face faculty development interventions, and there is limited literature examining faculty development in IPE for health practitioners and health support workers. Faculty development for health practitioners often occurs *in situ* (Steinert, 2005), and leaving the clinical setting to attend education and training may present challenges for faculty development (Silver & Leslie, 2017). Given this, and the recent necessary shift to online learning in response to the COVID-19 pandemic, it is reasonable that faculty development for IPE and IPCP adopts a flexible learning approach (Crawford et al., 2020; Gordon et al., 2020).
Online and/or blended faculty development for IPE and IPCP is an emerging field of practice and research. A decade ago, Cook and Steinert (2013) identified that although the evidence was limited and mixed, online faculty development is neither inferior nor superior to other approaches, and can be effective. There are benefits to utilizing online learning (Hayward et al., 2021), for instance, asynchronous learning allows for learning to occur across different sites or campuses, and learners may coordinate their learning around personal and professional commitments. Utilizing online formats may provide a solution to some of the identified logistical challenges faced, including time constraints, scheduling, equity of access and geographical limitations (Cook & Steinert, 2013; Reeves et al., 2017) and in doing so support equitable access.

This research addresses the need to develop health workforce IPCP capability through flexible, online and asynchronous IPE faculty development. The authors have previously published an evaluation on an Introductory Module (Bogossian et al, 2025). This paper reports on the four learning modules entitled "Faculty Development IPE-4-IPCP", hereinafter referred to as the 'IPE-4-IPCP' modules. Each module focussed on one of four key domains in IPE: design, implementation, assessment and evaluation to enable faculty to enact specific IPE and IPCP activities in educational and health settings. The IPE-4-IPCP modules provide foundational level knowledge through to more complex curriculum design, providing for a range of learner needs.

Aims

The aims of this paper are to describe: 1) the design processes, 2) content and face validation and 3) user group experience of the four IPE-4-IPCP online learning modules.

Background and context

The Sunshine Coast Health Institute (SCHI) was the setting for this research which comprises four partner organizations: three higher education institutions and a public hospital and health service. The SCHI provides a unique opportunity to integrate IPE and IPCP across practice and education, from pre-licensure and foundation studies to post-licensure and continuing professional development for health practitioners and health support workers. Hereafter, registered health practitioners and other health professionals are collectively called health practitioners, as distinct from health support workers. In this research, faculty refers to health academics, educators, facilitators, health practitioners and health support workers with formal or informal teaching roles.

Alignment between institutional culture, learning principles, frameworks and the needs of health professionals enable the effectiveness of faculty development programs (Steinert, 2005). A recent scoping review (Babin et al., 2023) highlighted the importance of having IPE faculty development programs for those responsible for teaching IPE in academic and in clinical practice settings and the need for more guidance in best practices for IPE faculty development programs.

At SCHI, an IPE Leads working group was formed in 2018 with the vision of "excellence in cross-sectoral interprofessional education across the continuum of learning". The need for a unified, cross-sectoral approach to IPE and IPCP was confirmed. This was important as faculty across the SCHI partner institutions can then take a consistent approach to the development of competency-driven interprofessional education initiatives (Hall & Zierler, 2015). A committee was formed with representation from each partner organization from health practitioners and health support workers at a variety of levels who shared decision-making, joint planning and invested time and effort (Hall & Zierler, 2015). Research team members have extensive experience in the tertiary education and/or healthcare sectors. Some are discipline leaders in the academic setting, others provide direct clinical care, and some have dual roles which provided the opportunity for deep engagement and project advocacy within each partner institution and across disciplines. To identify clear goals and ensure the faculty development structure fit the specific context (Hall & Zierler, 2015), learning outcomes and competencies were mapped across each of the partner organizations' pre-licensure, post-licensure and continuing professional development offerings. The Canadian Interprofessional Health Collaborative (CIHC) National Interprofessional Competency Framework (Canadian Interprofessional Health Collaborative, 2010) were agreed upon as common competencies.

Design Process for the Faculty Development IPE-4-IPCP Online Learning Modules

Pedagogical approach

The pedagogy applied in online learning spaces drives the approach, design and the technologies required to facilitate and support learning. It is suggested that blending multiple modalities may appeal to, and suit the needs of, different learners (Picciano, 2018a). Picciano (2018b) discusses how the Blending with Purpose model for online education can be adapted and expanded based on the requirements of the online learning course to become a Multimodal Model for Online Education (MMOE). In this research, components of the MMOE were applied to guide the structure and development of the IPE-4-IPCP online learning modules.

Content was delivered using Easy Generator, an e-learning authoring software with learning management system features. This self-paced independent software allowed fully online multimodal and asynchronous content delivery. *Dialectic or questioning* was addressed through discussion boards that provided the opportunity for learners to respond to reflective questions, observe the opinions of others and formulate their own responses (Picciano, 2018b). Discussion boards have been previously included in IPE online learning modules for health professions students (Miers et al., 2007) as they promote reflection, critical thinking, and create an environment for learners to contribute and connect (Donlan, 2019; Hall, 2015).

The process of *reflection* (Dewey, 1916) supports deeper understanding and interaction between intellectual knowledge and personal engagement (Holdo, 2022).

Analytics provided through Easy Generator supported *evaluation* in the MMOE through a summary of the rate of completion, duration of activity and engagement of the learners in the module content. Assessment was included through the use of quizzes, short response questions, and key term and definition comprehension exercises. Immediate feedback was provided to the learner. The concepts of *student-generated content or collaborative learning* and *social and emotional* support for learners were not included in the IPE-4-IPCP online modules. However, discussion boards allowed for some interaction between the learners (e.g., reading comments and replying) due to the modalities of content delivery.

Module Content Curation

Scoping reviews

Foundation scoping reviews were conducted to establish evidence for IPE design (Shakhovskoy et al., 2022), implementation (Bogossian et al., 2023), assessment and evaluation. The evidence from these scoping reviews was amalgamated into a best practice framework (Bogossian, 2022) which included shared definitions of relevant key terms and concepts important to support faculty development initiatives (Steinert, 2005). Together the scoping reviews and the best practice framework informed the IPE-4-IPCP online modules.

Module instructional design process

Instructional design processes involved alignment between the pedagogical approach (e.g., constructivism), the learner needs and experience, the learning activities, and formative or summative assessment. Applying a constructivist approach to online learning requires learning to be active, contextualised and promote the construction of personalised understanding and knowledge (Caplan, 2008). One team member (S-JH) undertook the instructional design work in collaboration with the research team to ensure that relevant and meaningful content was central to the development of online IPE modules (Hayward et al., 2021). The content was curated to ensure alignment of the pedagogical approach, learning experiences, intended learning outcomes and materials (Caplan, 2008). The learner profile characteristics of each learner group such as academic preparedness, resources, and motivation (Picciano, 2018a) were considered.

The learning materials were enhanced by video artefacts including footage from national and international experts (n=8) along with recorded patient/client stories (n=2) and guidance from experienced educators, health practitioners and health support workers (n=7). The content was purposely selected to promote inclusivity and to acknowledge the health workforce across the SCHI partner organizations. An overview of the IPE-4-IPCP online modules is provided in Table 1.

Table 1:

IPE-4-IPCP online learning modules overview

Module	Duration	Intended learning outcomes
Design	Recorded content: 30 minutes Total working time: 60 minutes	• Describe the three components of design for IPE and IPCP: participants, learning constructs and learning approaches. • Create an activity for IPE guided by the Teaching and Learning Decision-Making Tree (Owen, 2014). • Consider the characteristics of participants i.e., level and stage of progression, discipline type, number and group size ratios in relation to the design of IPE activities.

		• Articulate alignment between learning constructs (theories, frameworks, learning objectives) in the design of IPE activities. • Develop intended learning outcomes and approaches for IPE/IPCP utilizing the CIHC competency framework.
Implementation	Recorded content: 44 minutes Total working time: 60 – 75 minutes	• Reflect on motivations for implementation of IPE and IPCP from a facilitator and healthcare user perspectives. • Understand the CIHC competency framework. • Identify issues around professional socialization and how these influence the implementation of IPE and IPCP. • Reflect on strategies to overcome challenges in IPE implementation. • Develop a plan for implementing IPE and IPCP.
Assessment	Recorded content: 47 minutes Total working time: 60 – 75 minutes	• Identify the importance and benefits and of using a competency framework when assessing IPE/IPCP. • Describe the six competencies in the CIHC competency framework. • Distinguish between assessment *of*, *for* and *as* learning. • Classify intended learning outcomes at the institution, program, and course level. • Create intended learning outcomes for IPE/IPCP activities that relate to the CIHC framework competencies. • Utilize the Assessment Decision-Making Tree to plan assessments pertaining to IPE/ and IPCP. • Differentiate between assessment of learning and evaluation of IPE activities.
Evaluation	Recorded content: 10 minutes Total working time: 30 – 45 minutes	• Define the evaluation of educational activities in IPE. • Differentiate between the evaluation of IPE activities and the assessment of learning. • Distinguish between the three main types of evaluation that can be applied to IPE programs (process, impact and outcome. • Identify the type of evaluation techniques included in process evaluation for IPE. • Describe and apply understanding of impact evaluation for IPE. • Identify the importance of outcome evaluation for IPE. • Use a checklist for planning the evaluation of IPE programs and activities.

Module production

In consultation with information technology and learning designers, Easy Generator was selected as an appropriate platform as it utilizes a cloud-based learning management system, was accessible by all SCHI partners, and reduced access issues due to organizational firewalls. The characteristics of design for online learning were adopted, such that the module sequencing of activities, structure and layout was

consistent across all the modules to aid learner perceptions of the cohesion of the material (Fahy, 2008). A graphic designer developed the branding of the modules with graphics illustrating individual health practitioners and health support workers as jigsaw pieces combined in interprofessional collaborative practice (Figure 1). A similar approach was taken to develop the icons for each domain (Figure 2).

Figure 1:

Faculty Development IPE-4-IPCP online modules logo

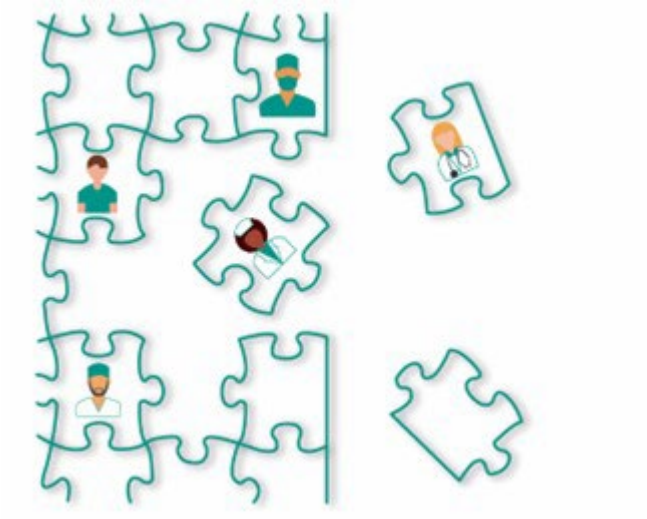


Figure 2:

Domain icons for the Faculty Development IPE-4-IPCP online modules

The production of the modules was undertaken over a period of four months, commencing with an introductory IPE-4-IPCP module which provided a common understanding of concepts for a broader audience. The IPE-4-IPCP online modules were developed in parallel with iterative modifications made to improve the design in preparation for testing in April 2022.

Content and Face Validation and User Group Experience

Research question generation

Purposefully including health practitioners and health support staff to inform module content and participate in study design, promoted the alignment between faculty development needs, structure and context (Hall & Zieler, 2015). The validation was influenced by a complementary strengths approach (Greene & Hall, 2010), incorporating pragmatism and constructivism. The pragmatic approach resulted in the selection of tools to validate the learning modules (Johnson & Onwuegbuzie, 2004), and the inclusion of the user group experience reflected the constructivist approach (Crotty, 1998). Two research questions were generated:

- What is the content and face validity of the Faculty Development IPE-4-IPCP online learning modules?
- What is the faculty user experience of the Faculty Development IPE-4-IPCP online learning modules?

A multi-methods study design was used, and the datasets were not mixed or merged. To address the first research question, validation was assessed by an Expert Panel in IPE. To address the second research question, focus groups which included representatives from the user group, allowed members of the intended audience to share their experience.

Procedure

Ethical considerations

The SCHI Executive endorsed the research proposal and partially funded this faculty development initiative. Approval from The Prince Charles Hospital Human Research Ethics Committee (TPCH HREC) was received prior to commencement (HREC/2021/QPCH/79333). Ethical approvals were received from the relevant HREC for each partner organization (GU Ref No: 2021/864; TAFE Queensland Endorsed 07/10/2021; UniSC A211657).

Sampling and recruitment

A panel of seven experts were purposively selected to participate in the study, and recruited by an email invitation from the chief investigator (FB). Five experts agreed to participate which satisfied the sample size requirement to reduce the risk of chance agreement (Zamanzadeh et al., 2015).

Purposive sampling was also used to recruit participants for the faculty user group. The research team circulated an email and an invitation to participate within staff networks across the four organizations. Participants in the user group were required to have experience in formal or informal teaching roles, whether as academics, health practitioners or health support workers.

All potential research participants received the participant information sheet, detailing the purpose of the research and possible benefits, risks and withdrawal processes. Consenting participants were emailed instructions to access the modules and to complete content validation tasks and data collection activities.

Data collection

Data was collected between April 2022 and August 2022. The data collection sequence and research questions are illustrated in Figure 3.

Research Q1

Expert panel members participated in initial content and face validity. Data was collected via online questionnaires using a Qualtrics survey link embedded at the end of each of the IPE-4-IPCP modules.

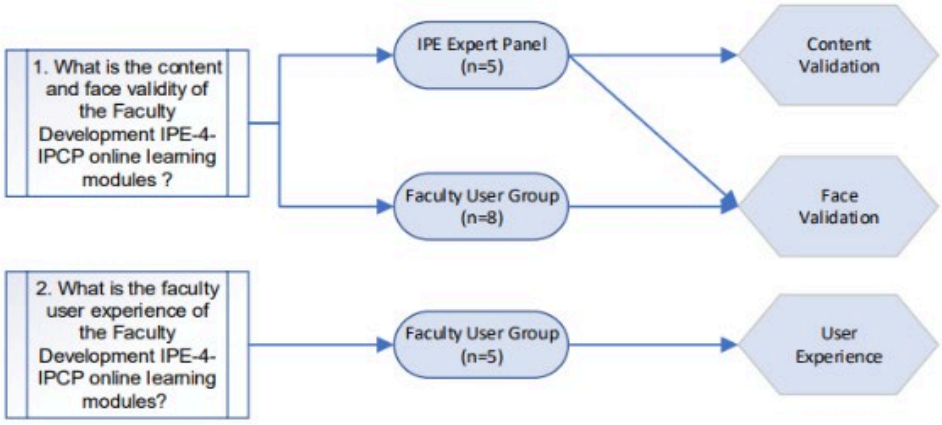
Faculty user groups participated in subsequent validation. Following module improvements informed by the expert panel validation process, faculty user groups completed face validity via an online questionnaire using a Qualtrics survey link embedded at the end of each of the IPE-4-IPCP modules

Research Q2

Faculty user groups participated in online focus groups to explore the second research question. Due to schedule constraints, not all of the user group participants (n = 8) were able to attend the focus groups. Two research team members (FB & S-JH) facilitated six focus groups using Zoom. Each focus group ran for 40 minutes.

Figure 3:

Multi-methods study design



Measures

Demographic data was collected for the faculty user and focus groups; these included: gender, age, and professional role.

The Expert Panel independently assessed the IPE-4-IPCP online modules using a modified Content Validity Form (CVF) (Silveira de Castro et al., 2007). A modified CVF has been included in previous research evaluating and validating learning modules (e.g., Lau et al., 2019; Rubio et al., 2003). The CVF uses a 4-point ordinal relevance rating scale to determine the representativeness of the item (Grant & Davis, 1997) 1 = *not representative*, 2 = *some revision required*, 3 = *representative but needs minor revision* and 4 = *very representative*. The key indicator terms for each of the six items included scientific accuracy and content. The Content Validity Index (CVI) was selected for its simplicity (Alsalamah & Callinan, 2021) to calculate the scientific accuracy and content of the modules. An Item-CVI (I-CVI) indicates the level of agreement between each item (range 0 – 1). I-CVI scores 0.80 or higher were deemed acceptable; items between 0.70 – 0.79 warrant revision, and average-CVI (Ave-CVI) values are deemed acceptable at 0.8 (Alsalamah & Callinan, 2021).

Members of the Expert Panel and faculty user groups individually completed a Face Validity Form (FVF). The scale items were drawn from criteria for the evaluation of printed education material proposed by Silveira de Castro et al. (2007). Items were adapted for online delivery, and only items deemed relevant for the research purpose were included (Bowling, 2014). These pertained to the literary presentation (11 items), illustrations (five items), and materials (six items). For example, scale items for literary presentation included *language is adequate for the audience and ideas are concisely expressed*;

for materials, *materials promote the correct understanding of IPE and IPCP.* The scale items were scored using adapted response scales from Bernier (1996), that is, 0 = *not met;* 1 = *partially met;* 2 = *met; or NA.* Scale items with 75% or more agreement were considered validated (Lau et al., 2019; Rubio et al., 2003). Open-ended questions were included in the FVF to capture additional feedback regarding the design, accessibility, and user experience.

The focus group questions addressed three Kirkpatrick outcome levels of IPE (Anderson, 2016; Freeth et al., 2002). Examples included:

1. Level 1 Reaction: *How do you think learners will react to learning about the IPE domain of (design, implementation, assessment or evaluation)?*
2. Level 2b Acquisition of skills and knowledge: *What do you know now – that you didn't know before – about the IPE domain of (design, implementation, assessment or evaluation)?*
3. Level 3 Behavioural change: *What impact do you think this module will have on the way you (design, implement, assess of evaluate) IPE in the future?*

Data Analysis

The data was exported from Qualtrics as a CSV file. Inter-rater agreement was calculated and met the recommended level (Davis, 1992; Grant & Davis, 1997). To calculate the I-CVIs, the number of items rated 3 or 4 was divided by the total number of Expert Panel members (Silveira de Castro et al., 2007; Lau et al., 2019). Ave-CVI was calculated from CVIs for each module. For the FVF, the items were scored individually, and a total score was calculated for each component (i.e., literary, illustrations, materials) from the Expert Panel and faculty user group data.

The focus group recordings were transcribed and cross-checked. The researchers completed a first sweep of the datasets to increase familiarity with the data. Each transcript was inductively coded (Braun & Clarke, 2006) by members of the research team (S-JH, ND & KH). The researchers discussed the unitization and coding process to ensure calibration. The codes were then separated into domains. The research team engaged in discussion throughout the process to resolve discrepancies and the validity was supported through intercoder agreement and cross-checking coding (Creswell, 2018). The next stage involved forming themes and sub-themes through re-reading the codes to identify similarities and differences. The findings are presented in a narrative discussion and graphic representation with representative quotes to strengthen the credibility of the results (Fereday & Muir-Cochrane, 2006).

Results

Participants

Participant characteristics of the user group and focus groups are reported below. Some faculty participated in both the user group and focus groups*.

Validation findings

Module content validation was assessed by the Expert Panel, who completed the CVF for all four IPE-4-IPCP online modules and as all CVIs were above 0.80, no revisions were required (Table 3). Open-ended responses from the Expert Panel members were largely positive and suggested minor modifications to the number and length of the video content, type of learning activities, layout and graphics. For example, in

Table 2:

Participant characteristics, faculty user group (*N* = 8) and focus group only* (*N* = 5)

Characteristics	Faculty user group		Focus group	
	%	*N*	%	*n*
Female or woman	87.5	7	80.0	4
Male or man	12.5	1	20.0	1
Age				
30 – 39	12.5	1	20.0	1
40 – 49	50.0	4	60.0	3
50 – 59	24.0	3	20.0	1
Health professional and university academic	75.0	6	80.0	4
Health support worker – Management	25.0	2	20.0	1
Formal education role for staff or students	87.5	7	80.0	4

relation to the Design Module one expert wrote "*too many videos - would rather have an animated slide show with audio options to hear the experts*". Another expert shared their feedback on the Assessment Module:

> Another wonderful and important module that focuses on the most important aspects of assessment in regards to IPE. Like the other modules, it was clearly structured with advance organizers providing clear direction. Again, the design and 'look' of the modules is excellent. There was a little unnecessary repetition in the assessment of learning tasks, but it was not overly burdensome.

Table 3:

Content Validity Index summary from Expert Panel (*n* = 5) responses

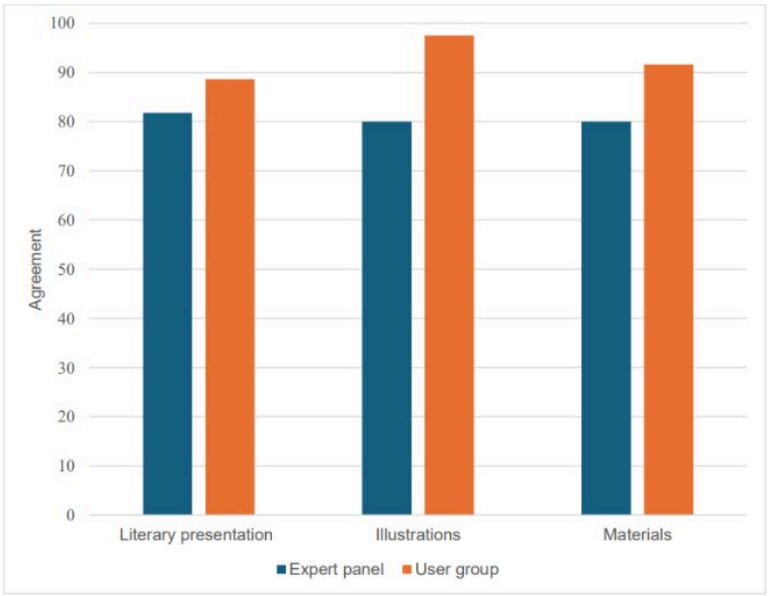
Criteria	Item Description	Design	Implementation	Assessment	Evaluation	Interpretation
		Ave-CVI				
Scientific accuracy	The module contents are representative of current knowledge surrounding IPE and IPCP.	1	1	1	1	Appropriate
	The recommendations are relevant and are correctly approached.	1	1	1	1	Appropriate

Content	Objectives are evident.	1	.80	1	1	Appropriate
	Recommendations about the desired behaviour are satisfactory.	1	1	.80	1	Appropriate
	The module contains necessary information.	1	.80	1	1	Appropriate
	The module content reviews important points.	1	1	1	1	Appropriate
	OVERALL CVI[a]	1	.93	.96	1	

Face validation was completed by the Expert Panel (n = 5) and subsequently by the user group (n = 8). The user group had a higher level of agreement across each component (Figure 4).

Figure 4:

Face validity



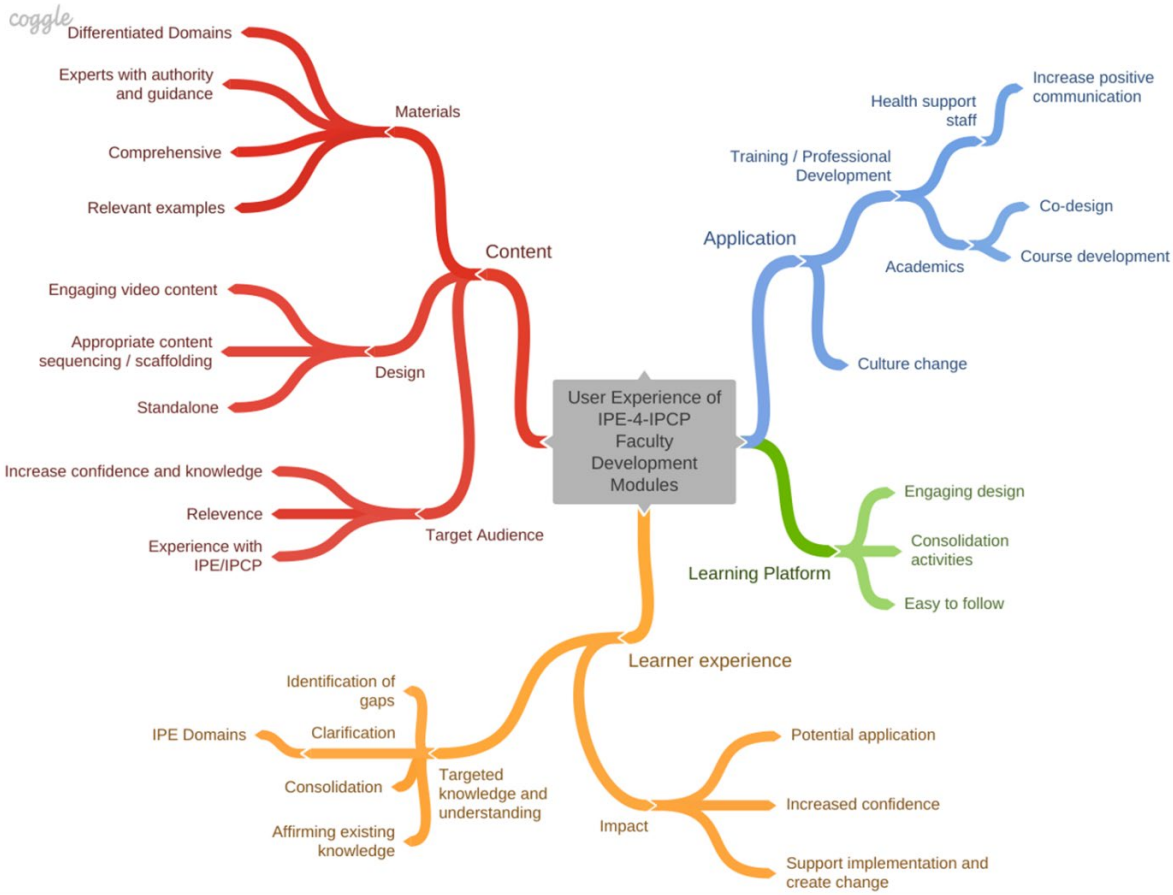
User Experience – Focus Group

The focus group provided a dual perspective on the IPE-4-IPCP online modules. Firstly, they shared their experience as learners engaging with the modules. Secondly, they provided commentary regarding the module content (design, materials and relevance) and the features of the learning platform. Finally,

participants reflected on the potential opportunities for integrating and utilising the modules within their current role. Figure 5 provides a graphic summary of the data analysis.

Figure 5:

Graphic summary of user group data analysis



Module Content

The participants reported that the *materials* included in the modules clearly differentiated the four domains and included guidance from leading experts in the field and references to relevant theories and frameworks. The *design* of the modules was engaging, included clear learning objectives, and the sequencing of content provided appropriate scaffolding to support learner engagement. Participant Four, an academic/paramedic reflected on the Design Module and explained:

> I don't know whether you need some background ... if you have some understanding of tertiary education, jump straight in… all those concepts were there and they were presented in a way which I digested and absorbed quite easily. So yeah, I think you could probably use it as a standalone object.

Conversely, Participant One, an academic/registered nurse, referred to the Assessment Module and discussed the relevance for health practitioners and health support staff:

> This would be good for people who do have background in, you know, academic assessment, designing learning outcomes, but yes, that there is a tiny little bit of a gap that ones who don't, who might be dealing with it but don't have that background.

Therefore, indicating that the focus for the different domains may be more applicable to different professional roles. For instance, Participant Two, an academic/psychologist explained:

> I feel the Evaluation Module [is] quite good for people who are not (in the) tertiary education sector directly, so people who are working in clinics or hospitals or other health services. In particular, the table that broke it down for what happens at the individual level, the team level and the organizational level… because I thought that really elucidated a lot of things…here's a really practical thing that you can do to understand the degree to which your teams or individuals are already doing these things or even just if you wanted to get a gauge on.

This point was highlighted by Participant Three, a health support worker when referring to the Implementation Module:

> Anyone who was watching that or who progressed through the videos and read that content would come away with an understanding and appreciation of IPE and maybe I'm a bit biased because to me, I just think it's wonderful, its simplicity, this is how we care for our patients, why wouldn't we want to learn this way? But yeah, I did feel like it gave people an understanding "well, we can do this, I can do this in my clinical practice, I can do this in my education space". You know, maybe even if in an informal [way] and build their skills up in the area over time.

Participant Three went on to explain the importance of highlighting the health support worker perspective, "I loved seeing the reference to clinical support that was from a personal, very personal perspective, it felt like the language there was very inclusive". Finally, Participant Five, an academic/occupational therapist, explained that the *target audience* may feel an increase in confidence in their practices and understanding of IPE/IPCP:

> They'll probably feel informed through the process. And probably reassured that they've already got some good practices happening. But I think they'll also learn some new things, you know, I certainly felt like there was some things that were, consolidating for me, but also, some new information and just some refreshing, which was great.

Learning platform

The focus group provided positive feedback regarding the learning platform, the access to learning activities, the display of progress, results or scores from learning activities, and the sophistication of the design and layout for each of the modules.

Learner experience

The participants described wide variation in their exposure to faculty training and their perceived capability to conduct effective IPE, ranging from no education qualifications or IPE training through to formal education qualifications and IPE facilitation training. Few, if any, had formal training in the design, implementation, assessment, and evaluation of IPE initiatives.
The participants explained that the IPE-4-IPCP online modules provided *targeted knowledge and understanding* of IPE and IPCP through the identification of gaps in their existing knowledge, clarification and consolidation of key concepts and topics of IPE and IPCP. Participant Four, an academic/paramedic shared that they had reflected on a gap in their knowledge regarding implementation of IPE in classroom settings:

> I certainly learned things along the way and I'm certainly still no expert yet, and I was still learning things in using these modules. So, I wasn't really the novice, novice who was looking at them but when I think about what I was going through, and thinking about the resources, I thought, [it was] easily digestible the way, the way or step down into those sections and a little summary and here's an expert talking about this topic etc.

Participant Two, an academic/psychologist shared, *"*I think that the assessment – evaluation distinction was kind of one of those things that I haven't really had elucidated or had clarified for me. And I sort of went, "oh yes, of course. That makes so much sense"*"*. Finally, Participant Five, an academic/occupational therapist explained, *"*I certainly felt like there was some things that were, consolidating for me but also, you know some new information and some was refreshing, it was great*"*.
The participants shared the *impact* of the Faculty Development IPE-4-IPCP online modules such as increased content building confidence, and potential for implementation or application in their role. For example, Participant Three, a health support worker explained, *"*I found that going through your modules..... kept reinforcing, that it's how we actually work and so it really simplified it the way that you, went through the module and made it feel like a more achievable thing*"*.

Application

The participants shared that the modules were potentially beneficial as *training or professional development* resources within their teaching and professional teams. The relevance for academics was highlighted by Participant Two, an academic/occupational therapist:

> I would probably get all of the team to do the module first. And then come together to talk about what we're already good at, and where we need to work a bit more focused to improve our practices. And look at what our barriers are to implementing the best practice and how we could overcome that. And it could be time, skills, different people.

Whereas, Participant One, an academic/registered nurse referred to their role as an academic:

> What I learnt that I didn't know before of course is the beautiful examples that were provided on how others assessments for IPE. I really like that so, I think that's going to give our academics really good examples of where we can and how we can embed IPE assessment. To meet the competencies. I thought that was done really well.

Participant One additionally explained:

> I may put forward some of the things that have been referenced in this module. In particular those how to evaluate IPE decisions, you know, strategies to the people who are developing those courses and thinking how can we build this even at the undergraduate level. And beginning with the end in mind as they say. But I think that's the most practical application I can think of in my particular setting.

And Participant Two an academic/psychologist referred to applying their understanding to course development:

> That's something I will consider and further that we have our accreditation coming up next year, and we have two new courses that we're launching one about interpersonal communication… the things that have been referenced in this module, in particular those how to evaluate IPE decisions… thinking how we can build this even at the undergraduate level.

Finally, Participant Three, a health support worker, highlighted the potential for culture change:

> I'll refer back to Professor John Gilbert, being realistic you can't just throw it on a Friday afternoon, and you know throw a packet of biscuits on the table and say, "we're ready to go for education". I think, I know that, but I think calling that out, and making sure that people give a commitment of time and it's also that reinforcement about how it is, and how important it is with that leadership, to progress into this space... giving people that understanding and having someone speak with authority and experience, like the Professor did, was something that I think is essential to include in this type of thing.

Regarding application in their role, Participant Three also expressed:

> I really think the principles can be applied in any environment… I'm in a new team… and one of the really important things about coming together as a team is working together to understand whatever each other's roles are, the basic underlying principles of IPE, can actually be applied to create a successful outcome in your team. So, I guess those sorts of things are universal, making sure that you've gotten understanding and open communication with anyone in our team [when] they're coming from those diverse roles.

Discussion

The first aim of this paper was to describe the design of the IPE-4-IPCP online learning modules. A broad definition of faculty was chosen and included all health practitioners and health support staff who have a teaching role, to respond to the lack of evidence for faculty development, particularly in health

care institutions (Silver & Leslie, 2017). The foundation for the design of the IPE-4-IPCP online learning modules was agreement across the SCHI partners on the use of the CIHC as a common framework. This process served to ensure that the module design would fit the strategic needs of each partner within the individual organization's interprofessional curriculum landscape (Hall & Zierler, 2015) and align with accreditation and practice standards (Bogossian & Craven, 2021). The modules aimed to provide a unified approach to faculty development across the SCHI partners to support individual faculty to effectively design, implement, assess and evaluate IPE and IPCP initiatives so that learners across the organizations experience a unified and consistent approach to IPE and all partners share the impact of IPE (Willgerodt et al., 2015).

The design of the modules was informed by a constructivist approach in which learners are encouraged to reflect on their learning and understanding, and the potential application of their knowledge to relevant contexts or situations. Opportunities for reflective practice were embedded using case-study examples, embedded video segments, narrated slides and reflection activities and exercises. The elements of a MMOE can support the creation of a learning community (Picciano, 2018a) and although the primary purpose of the IPE-4-IPCP online modules was to provide professional development for faculty across the SCHI partnership, a secondary intention was to create a community of practice for IPE faculty. The community of practice may provide the opportunity for greater engagement and potential specialization in one of the IPE domains. Such as, an academic with the role of a course coordinator, may include the Assessment Module as a training resource within their teaching team. In addition, the modules could serve as training resources for health support staff and be integrated into face-to-face training options. Reporting this process adds to understanding the ways that learning theories can aid IPE curriculum development (Hean et al., 2009).

Designing the modules via online delivery overcame logistical issues such as scheduling, locations, and clinical workloads and was particularly well-suited for faculty development (Cook & Steinert, 2013) in the healthcare setting. However, the decision to employ online delivery did represent an organizational IT system constraint, that may be relevant to other healthcare settings and required the use of an external provider a common learning management system.

The second aim was to report on the validation and user group experience. The content validity indices for the modules were high, which is indicative of agreement between the IPE experts, and attests to the scientific accuracy and validity of the content. This is not surprising given the design process for determining the content of the modules combined evidence with expertise. Face validity scores also indicate that the modules are acceptable. The differences between the expert and user groups may reflect that the modules were modified in response to expert feedback prior to release to the user groups where there was improved acceptance.

The focus group data indicated that the user experience was good, with thematic analysis supporting the wider use of the modules for faculty development for other learners, acquiring skills and knowledge, and impact on future practice. Notably, this research extended beyond health faculty in academic institutions to include health practitioners and health support workers. A faculty development program that spans the continuum of health professions education may encounter sources of resistance to IPE at the individual (micro) level, as a consequence of, for example, professional socialization (Oandasan & Reeves, 2005). IPE faculty development initiatives are enabled by meso-level factors of leadership support and the inclusion of relevant stakeholders (Oandasan & Reeves, 2005), even in complex cross-institutional settings like SCHI.

Strengths

This research has responded to a contextual need to strengthen IPCP capability through IPE faculty development. The IPE-4-IPCP online modules addressed the need for faculty development across four organizations, extending this opportunity beyond the academic workforce to health practitioners and health support workers and are therefore responsive to the entire health workforce.

The design was informed by learning theory and models, evidence, and purposively selected expert and user groups which combined to enhance asynchronous online delivery of IPE faculty development. The research used established CVI methods, achieved the recommended minimum sample size and used a four-point scale (Almanasreh et al., 2019) as well as adapting a comprehensive face validity measure to an online application. These data were complemented by qualitative data from online focus groups.
The research team and the study design included a multi-professional participant group for both the validation and user group experience. This approach aligned with the fundamental view of IPE and IPCP, as outlined by Hayward and colleagues (2021):

> Bringing together faculty who have a common interest in the delivery of IPE is the very basis of IP facilitation. Sharing ideas regarding interprofessional course development, learning strategies, and awareness of opportunities allows facilitators the opportunity to make connections to initiatives that they can see themselves facilitating.

Limitations

This research was conducted during the height of COVID-19 in Australia. Due to the health practitioner workforce pressures at the time, the sample for the user group comprised of health practitioners with dual roles as academics and health support worker staff, and did not include those with single academic or health practitioner role. Thus, a limitation may be the lack of specific user experience reported. This was partly mitigated by the user groups and focus groups where the majority had a health practitioner background. A further limitation imposed by the research timeframe was that an actual change in IPE practice could not be determined.

Future directions

The four IPE-4-IPCP online modules are a resource for staff across the SCHI partner organizations. Future research will be conducted following the broader implementation of the modules to explore uptake and analyse responses to learning activities and discussion board comments. However, leadership support and sustainability of resources in a cross-institutional setting like the SCHI are challenges to ongoing maintenance of such resources including funding access through an external learning management system.

Conclusion

Cross institutional partnerships between education providers and health care facilities provide a challenging context for IPE faculty development. This paper reported on the design, validation and user experience of a suite of flexible, online and asynchronous IPE faculty development modules as a solution to support faculty responsible for teaching IPE in academic and in clinical practice settings. It provided guidance in best practices for IPE faculty development programs, highlighting that carefully designed online learning modules can be an effective way to engage and support faculty involved in design, implementation, assessment and evaluation of IPE experiences.

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