Society of Medical Education & Research

2022, Volume 2, Page No: 96-107
ISSN: 3108-4850

Annals of Pharmacy Education, Safety, and Public Health Advocacy

Stakeholder Perspectives on Structures and Processes Enabling Interprofessional Education in Pharmacy Experiential Placements

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Abstract

To examine stakeholder perspectives on the organizational frameworks and mechanisms that support both planned and incidental interprofessional education (IPE) within experiential learning (EL) placements for pharmacy students in Scotland. Virtual semistructured group interviews were held with academic faculty, practice-based educators, and EL facilitators (preceptors). Audio recordings were transcribed word-for-word and subjected to thematic analysis. The study was informed by systems theory. Ethical clearance was obtained from the School of Pharmacy and Life Sciences Ethics Review Committee at Robert Gordon University.

Three overarching themes emerged: the existing context and delivery of IPE, determinants influencing IPE implementation and pharmacy student learning, and reconceptualizing current IPE approaches. Stakeholder feedback yielded important insights into presage elements associated with contextual factors (cultural, logistical, and regulatory) and how these shape IPE provision and interprofessional learning. Characteristics of EL facilitators and student pharmacists were also identified as influential. Process-related factors included illustrations of both structured and informal IPE opportunities available across community, hospital, primary care, and specialist pharmacy practice settings. Product-related factors emphasized the role of IPE in fostering collaborative competencies. Future directions should prioritize a longitudinal IPE learning continuum and improved coordination between higher education institutions, placement providers, and interprofessional practice teams. The development and implementation of new IPE curricula present notable challenges. Nonetheless, this study offers a robust evidence base to guide future initiatives, ensuring that new strategies effectively promote meaningful interprofessional learning during placement experiences.

Keywords: Interprofessional education, Interprofessional learning, Pharmacy education, Experiential learning, Practice-based learning

Introduction

International policy frameworks recognize interprofessional education (IPE) and collaborative practice as core components of transformative strategies designed to enhance the health and social care workforce's ability to support integrated health systems [1–3]. Regulatory authorities responsible for the education and training of health professionals increasingly mandate the incorporation of IPE within undergraduate programs. In pharmacy education, this is reflected in standards set by bodies such as the US Accreditation Council for Pharmacy Education and the Canadian Council for Accreditation of Pharmacy Programs, both of which require curricular elements that prepare graduates to deliver patient care as effective members of collaborative teams across diverse practice environments [4, 5]. Likewise, the UK regulator, the General Pharmaceutical Council (GPhC), requires the inclusion of IPE opportunities beginning early in Master of Pharmacy (MPharm) programs and developing

Access this article online https://smerpub.com/

Received: 12 November 2021; **Accepted:** 14 February 2022

How to cite this article: Martins JL, Costa H, Figueiredo RP. Stakeholder Perspectives on Structures and Processes Enabling Interprofessional Education in Pharmacy Experiential Placements. Ann Pharm Educ Saf Public Health Advocacy. 2022;2:96-107. https://doi.org/10.51847/vZCshmIghq

progressively throughout the course of study [6]. A growing body of literature has explored the characteristics of IPE initiatives within pharmacy curricula, frequently noting substantial variability and limited standardization [7–9]. Jones and colleagues reported that slightly more than half (55%) of US colleges and schools of pharmacy incorporated IPE within introductory pharmacy practice experiences, with respondents identifying restricted access to adequate health care settings and workforce resources as key obstacles to implementation [7].

The "2022 Global IPE Situational Analysis Results Final Report" documents changes in the incorporation of interprofessional education (IPE) within health professions curricula over the preceding decade. Although notable expansion has occurred, the report underscores pronounced geographical inequalities in the presence of formalized IPE programs, sustainable funding mechanisms, and centralized institutional frameworks for IPE coordination [10]. Illingworth and Chelvanayagam summarize different models through which IPE has been embedded in undergraduate professional education, observing that students respond more positively to initiatives that are clearly aligned with real-world professional practice [11]. When implementing both intentionally designed and incidental IPE within practice-based placements, attention must be given to issues such as sufficient staff preparation and the inherent difficulty of identifying suitable interprofessional learning opportunities across heterogeneous practice contexts [12]. Moreover, involving stakeholders in the joint development of practice-based IPE activities may mitigate barriers operating at macro-, meso-, and micro-levels, including constraints related to funding, organizational logistics, and the workload of experiential learning (EL) facilitators [13]. Findings from the Task Force on Intentional Interprofessional Education within Experiential Education, convened by the American Association of Colleges of Pharmacy, indicate that existing scholarship provides limited direction regarding the planning and evaluation of deliberately structured IPE within EL environments. Their guidance emphasizes embedding planned IPE experiences across the full curriculum and utilizing campus-based IPE to better prepare students and strengthen interprofessional engagement during placements [14]. Nisbet and colleagues further demonstrate that meaningful learning outcomes may arise not only from formally organized IPE activities but also from informal interprofessional encounters [15].

In Scotland, pharmacy education is delivered through 2 institutions: the School of Pharmacy and Life Sciences at Robert Gordon University (RGU) and the Strathclyde Institute of Pharmacy and Biomedical Sciences at the University of Strathclyde. Student pharmacists undertake a 4-year master's degree program, followed by a foundation year in professional practice and successful completion of the GPhC assessment prior to pharmacist registration. Experiential placements are a compulsory component of the EL curriculum for all students and are completed across community pharmacy, primary care, hospital, and specialist practice settings during the first 4 years of study. Placement provision is coordinated collaboratively by RGU, the University of Strathclyde, NHS Education for Scotland (NES), and additional pharmacy stakeholders. On behalf of the universities, NES is responsible for financial oversight and quality assurance processes, including the approval of training premises and the preparation of EL facilitators. Facilitator preparation requires mandatory completion of the Preparation for Facilitating Experiential Learning (PFEL) program and engagement in a supervisor development and quality assurance cycle every 3 years. As part of this process, EL facilitators submit a self-declaration confirming participation in professional learning activities and completion of GPhC revalidation entries relevant to their supervisory responsibilities. Optional peer-review sessions, led by practice educators, are also offered to support ongoing professional development through facilitated group reflection among EL facilitators.

The development of IPE curricula is inherently complex. Effective implementation necessitates strategic planning that adopts an integrated, longitudinal perspective, incorporates experiential education, and aligns with appropriate assessment strategies [16]. The literature consistently calls for greater emphasis on IPE-focused research to support the introduction of new initiatives through evidence-informed approaches [10, 17]. Accordingly, this study sought to examine stakeholder perspectives on the organizational structures and operational processes that underpin both planned and unplanned IPE during placement experiences, with a secondary aim of identifying training requirements among stakeholders. This work formed the initial phase of a broader research program aimed at the development and implementation of IPE within the EL curricula of the

2 Scottish MPharm programs. Conducting a comprehensive assessment of existing placement practices was therefore considered essential prior to the introduction of any new interventions.

Materials and Methods

A pragmatic epistemological position guided the study, with a qualitative methodology selected to enable an in-depth exploration of the research topic. Over the last 2 decades, there has been increasing emphasis among educators and researchers on grounding IPE initiatives in theoretical frameworks [18]. Given the multifaceted nature of IPE and the exploratory objectives of the study, systems theory—characterized by a holistic view of interacting components rather than isolated elements—was adopted as the overarching theoretical lens [19]. The Biggs 3P Model and the 3P Model of Learning to Collaborate conceptualize educational environments in terms of presage, process, and product dimensions, framing learning contexts as interconnected microsystems that retain partial autonomy while functioning within a broader system [20, 21]. These frameworks informed the design of the semistructured group interview guides used for data collection. Development of the guides was further informed by a targeted literature review and iterative discussions among members of the research team (CD, AA, SC, and BA). The finalized interview schedules were assessed for face and content validity by additional team members with extensive experience in pharmacy education and research (AB, SAJ, AP, and JP) **(Table 1)**. Pilot testing was undertaken prior to formal data collection, and no amendments were required.

Table 1. Interview schedules were employed during group interviews.

No.	Paraphrased interview questions
1	Please begin by briefly describing your professional practice area and your role in supervising or hosting student pharmacists during EL placements.
2	What awareness do you have of the interprofessional education (IPE) activities delivered on campus to student pharmacists at the two Scottish schools of pharmacy?
3	How significant do you believe access to IPE opportunities is for student pharmacists during EL placements? **Prompts:** For what reasons? When planning EL activities, do you actively give priority to IPE?
4	What types of IPE opportunities are available, whether formally organized or arising informally? **Prompts:** Opportunities to demonstrate collaborative practice? Opportunities for interaction with other health care students or qualified professionals?
5	Based on your experience, how do student pharmacists respond to IPE opportunities? **Prompts:** What is their reaction when such opportunities arise? Do you observe enthusiasm or reluctance? What guidance or training do you provide? Do students proactively seek these opportunities? In what ways does current PFEL training support IPE during EL placements?
6	Are there any aspects of the current PFEL training you would modify to better support facilitation of both planned and opportunistic IPE during EL placements? **Prompt:** What is the rationale for these changes? Is a stronger, more explicit focus on IPE required?
7	What factors do you perceive as enabling or constraining the implementation of these changes? **Prompts:** Organizational culture around hosting student pharmacists? Attitudes toward IPE? Time demands?
8	Is there anything further you would like to contribute to this discussion?

Abbreviations: IPE—interprofessional education; EL—experiential learning; PFEL—Preparation for Facilitating Experiential Learning.

The research team determined that 3 distinct stakeholder cohorts were pertinent to the investigation because of their direct or indirect roles in the coordination, management, and/or delivery of IPE and EL activities. Potential participants were contacted via email, distributed either through NHS Education for Scotland (NES) or directly by members of the research team (CD and AP). Recruitment of EL facilitators employed a total population sampling approach. All individuals who had successfully completed PFEL training and who were employed at NES-approved placement sites during the 2021/2022 academic year were invited to participate (n = 1135). These placement locations were dispersed across Scotland, encompassing both metropolitan and rural regions, and included pharmacists working within the 14 territorial health boards, selected national special health boards, and community pharmacies operating under contract. Academic staff and practice educators were

recruited using purposive sampling techniques. Eligibility was restricted to individuals with responsibilities for the planning and/or implementation of IPE and/or EL activities within the 2 schools of pharmacy (n = 7), as well as practice educators involved in the delivery of PFEL training (n = 6). As described by Johnson and colleagues [22], purposive sampling aims to identify participants who possess the most relevant experiential knowledge within an appropriate contextual setting, thereby increasing alignment with the research objectives. To prevent potential participant identification, detailed demographic variables, including age and gender, were deliberately not collected from those recruited through purposive sampling.

All group interviews were conducted remotely by a single researcher (CD) with formal training and prior experience in qualitative interviewing. Automated transcription software was used to generate initial transcripts, which were subsequently checked against the audio recordings, corrected to ensure verbatim accuracy, and anonymized by CD. A secondary review was undertaken by BA to verify transcript accuracy and to facilitate immersion in the dataset, contributing to analytical rigor. Data analysis employed a codebook-driven thematic approach, integrating both theory-informed (deductive) and data-driven (inductive) strategies [23]. One interview transcript was independently coded by CD and BA, with subsequent discussion used to refine initial codes, subthemes, and overarching themes. All remaining transcripts were coded by CD, supported by ongoing analytical discussions with the wider research team. NVivo software was used to support systematic data management and enhance transparency. Ethical approval was granted by the School of Pharmacy and Life Sciences Ethics Review Committee at Robert Gordon University (RGU) in November 2021 (approval number S292). Informed consent was obtained from all participants prior to data collection.

Results and Discussion

A total of 5 group interviews were completed between November 2021 and March 2022, involving 2 academic staff members, 4 practice educators, and 6 EL facilitators. All 6 academic and practice educator participants also reported previous professional experience within pharmacy practice environments, including community pharmacy (n = 3), hospital pharmacy (n = 2), and primary care (n = 1). During one interview session, a participant experienced technical connectivity difficulties approximately 20 minutes after commencement and was unable to rejoin the discussion. Allocation of participants to interview groups was determined by availability **(Table 2)**. Interview duration ranged from 42 to 80 minutes.

Table 2. Configuration of group interviews.

Group Interview	Participant Type
1	Academic staff; practice educator
2	Academic staff; practice educator
3	Practice educators (n = 2)
4a	EL facilitators (community and hospital settings)
5a	EL facilitators (hospital [n = 1], out-of-hours service [n = 1], primary care [n = 2])

Abbreviation: EL, experiential learning.
a Interviews involving EL facilitators were initially scheduled to include 3 participants; however, 1 individual was unable to attend due to clinical responsibilities and subsequently joined a later session.

Thematic analysis resulted in the identification of 3 principal themes comprising 9 subthemes. Findings are presented in narrative form and supported by representative quotations, which are mapped to presage, process, and product components of the Biggs 3P model **(Tables 3–5)** [20].

Table 3. Supporting quotations for theme 1 aligned with subthemes and biggs 3p model domains [20].

Subtheme	3P Domain	Supporting Quotations
(i) IPE opportunities	Process	"We are fortunate to have access to mental health teams, out-of-hours services, pharmacist teams, and dental teams; students are paired with these services and shadow them during parts of their placement." (EL facilitator; out-of-hours service; GI 5) "…Last week, while I stepped away to make a call, the students asked the ICU dietician about her role, which she explained—this was a great example of spontaneous, unplanned IPE." (EL facilitator; hospital; GI 5) "…In

		hospital, there tends to be more variety in the student mix, creating a culture where contributions from all healthcare professionals are expected." (Practice educator; GI 3)
(ii) Lack of specific IPE focus	Presage	"The universities' learning outcomes for students do not explicitly mention interprofessional education." (Practice educator; GI 1) "There's potential for informal IPE, but it might conflict with the prescribed learning objectives we have to follow…" (EL facilitator; hospital; GI 5) "It's not prioritized by student pharmacists because they have so many other demands." (Academic; GI 1) "…If I were leading a PFEL session, I wouldn't actively make IPE a focus, suggesting there is a gap that requires attention." (Practice educator; GI 1)
(iii) Perceptions of IPE / Collaborative Practice	Presage; Product	"It's critical… fundamental skills like communication, prioritization, and understanding MDT roles are essential; students would be unprepared for real practice without them." (Practice educator; GI 1) "Sometimes patients struggle to understand parts of their care plan, and as a team we each contribute to addressing those gaps." (EL facilitator; hospital; GI 4) "Community pharmacy can be isolating; you work independently and may not be fully recognized as part of the wider healthcare team." (EL facilitator; community; GI 4) "…In community practice, there can be a cultural barrier in professional communication; when solving problems, we may focus too narrowly." (Practice educator; GI 3)

Abbreviations: EL, experiential learning; ICU, intensive care unit; IPE, interprofessional education; GI, group interview.

Table 4. Supporting quotations for theme 2 aligned with subthemes and biggs 3p model domains [20].

Theme 2: Factors influencing IPE delivery and student pharmacist learning	Subtheme	3P (Presage, Process, Product) domain	Illustrative quotes
(i) EL facilitator factors	Presage; process	"I feel quite passionate about IPE. I believe I've grown into an advanced pharmacist and specialized because I benefited from an interprofessional environment." (EL facilitator; hospital; GI 4)	"We need to adopt a fresh approach to risk management, which involves collaborating with individuals more accustomed to taking risks …" (Academic; GI 2)
(ii) Student pharmacist factors	Presage; process	"It's beneficial to have motivated students… but it can be challenging when students are disengaged or unmotivated." (EL facilitator; community; GI 4)	"Medical students arrive well-prepared, actively seeking learning opportunities, while pharmacy students may require more guidance due to less prior knowledge." (EL facilitator; hospital; GI 5)
(iii) Logistical factors	Presage; process	"Within a five-day placement, what is feasible and most valuable? Sitting with a GP for a day may be less helpful than a strong grounding in that area of pharmacy practice." (Practice educator; GI 1)	"Students gain some IPE from participating in MDT ward rounds, but frequent attendance makes it challenging." (EL facilitator; hospital; GI 5)
(iv) Regulatory factors	Presage	"The placement criteria are very strict; more student-directed learning might allow greater benefit." (EL facilitator; primary care; GI 5)	"Students are expected to be actively involved rather than just shadowing, creating a need to balance exposure to other professionals with productive work." (EL facilitator; hospital; GI 5)

Abbreviations: EL, experiential learning; GI, group interview; IPE, interprofessional education; MDT, multidisciplinary team.

Table 5. Supporting quotations for theme 3 aligned with subthemes and biggs 3P model domains [20].

Theme 3: Rethinking current IPE provision	Subtheme	3P (Presage, Process, Product) domain	Illustrative quotes

(i) Emphasis on a continuum of learning	Presage; process; product	"Health boards need clear expectations that students gain experience with other healthcare professionals; with support, it becomes easier to integrate this into practice." (Practice educator; GI 3)	"Introducing this early in the undergraduate program would likely help students overcome barriers, as I imagine it would have helped me." (EL facilitator; hospital; GI 4)
(ii) Need for a more coordinated approach	Presage; process; product	"I know very little about what is currently offered or how students engage interprofessionally; I simply wouldn't know." (EL facilitator; hospital; GI 5)	"It feels very fragmented; everyone is doing different things without continuity. Planning and communication are major issues moving forward." (EL facilitator; out of hours service; GI 5)

Abbreviations: ACT, Additional Cost for Teaching; GI, group interview; IPE, interprofessional education; PFEL, Preparation for Facilitating Experiential Learning.

Theme 1: contemporary approaches to IPE delivery

Subtheme: nature and availability of IPE opportunities

Participants described a spectrum of interprofessional learning encounters, most frequently involving interaction with qualified health and social care professionals, such as participation in ward-based activities and multidisciplinary team (MDT) meetings. These learning experiences were predominantly characterized as incidental rather than formally structured, often emerging from routine workplace interactions facilitated by EL supervisors or accessed opportunistically by student pharmacists. Instances of intentionally designed IPE activities—developed collaboratively by interprofessional teams and involving learners from multiple disciplines—were infrequently reported. One example involved a hospital-based interprofessional learning initiative delivered on inpatient wards; however, participants noted that such activities were limited to certain territorial health boards. Perspectives varied regarding which practice environments were most conducive to IPE. Some participants considered community pharmacy placements to offer fewer opportunities, whereas hospital, specialist, and primary care settings were viewed as more supportive due to routine collaboration within MDTs and the presence of students from other professional programs. In contrast, other participants emphasized that community pharmacy placements could also facilitate planned IPE where pharmacists had established collaborative working relationships with local health care professionals, such as general practitioners (GPs) and nurse practitioners, alongside informal interprofessional engagement.

Subtheme: absence of a clear IPE emphasis

Participants highlighted that EL handbooks did not explicitly articulate IPE-related learning outcomes. Several viewed this omission as implicitly reinforcing a predominantly uniprofessional orientation to learning. Additionally, one practice educator noted that PFEL training itself lacked an explicit emphasis on IPE.

Subtheme: views on IPE and collaborative practice

Overall attitudes toward IPE were favorable, with participants describing it as a fundamental component in preparing student pharmacists for future collaborative working environments. IPE was perceived to enhance understanding of the roles and expertise of other professionals, clarify the pharmacist's contribution within the broader MDT, and build confidence in communicating with health and social care colleagues. Participants also emphasized the perceived benefits of collaborative practice for improving patient care and clinical outcomes. However, some setting-specific perceptions emerged, particularly in relation to community pharmacy, where an insular professional culture was described as a potential barrier to interprofessional communication. This was viewed as potentially restricting IPE opportunities and, in some cases, shaping student learning through unfavorable role modeling. In general, MDT members were considered open and receptive to IPE engagement.

Theme 2: determinants influencing IPE delivery and student pharmacist learning

Participants offered detailed perspectives on factors that either supported or constrained interprofessional learning among student pharmacists.

Subtheme: EL facilitator–related factors

The degree to which EL facilitators actively prioritized IPE—or did not—was identified as a key enabling or

limiting influence. Some participants described their own perception of the EL facilitator role as being centered primarily on the pharmacist and the pharmacy profession, whereas one participant reflected on the positive influence that exposure to IPE had on their own career trajectory. A negative culture surrounding EL facilitation, and IPE facilitation in particular, was also discussed. This was sometimes attributed to individual characteristics, with certain EL facilitators perceived as inherently risk-averse, contributing to issues of trust. Participants further associated this culture with the additional workload linked to EL facilitation, including advance planning, arranging interprofessional shadowing opportunities, and dedicating extra time to student support. One participant working in primary care noted that, unlike general practitioners, EL facilitators did not benefit from formally protected time within their contracts for training activities. Limited confidence, insufficient expertise, and weak integration within MDTs were also identified as factors that could restrict the availability of IPE experiences.

Subtheme: student pharmacist–related factors

Learner-specific characteristics, including motivation, level of engagement, and expectations, were described as influencing interprofessional learning positively or negatively. Participants reported observing considerable variation in confidence, knowledge, and competence among student pharmacists, as well as between pharmacy students and those from other professional programs. One participant indicated that uncertainty regarding individual student capability sometimes discouraged EL facilitators from involving other MDT members, thereby reducing potential IPE exposure. Beyond gaps in clinical knowledge, participants highlighted limited student understanding of professional roles, including those of pharmacists working across different practice sectors, particularly primary care. These misunderstandings were perceived to contribute to unrealistic expectations and reinforce a narrow, uniprofessional perspective.

Subtheme: logistical influences

The relatively short duration of pharmacy placements, compared with placements undertaken by students from other disciplines, was frequently cited as a constraint. Some participants indicated that this encouraged a focus on uniprofessional learning, which they considered more immediately relevant to student pharmacists' development. Increasing cohort sizes within pharmacy programs were also identified as creating challenges for both EL facilitators and interprofessional colleagues. Timetabling difficulties and the lack of student colocation were reported to result in missed IPE opportunities. Additional setting-specific logistical barriers were discussed, particularly in community pharmacy, where the geographically dispersed and unpredictable nature of daily work limited the feasibility of planning structured IPE activities.

Subtheme: Regulatory and governance considerations

University requirements were perceived as overly prescriptive and largely oriented toward uniprofessional pharmacy competencies. Furthermore, the expectation within Scotland that student pharmacists should be actively "doing" rather than observing was viewed as reinforcing a uniprofessional emphasis and constraining IPE participation. Contractual conditions governing student working hours and limited flexibility were also identified as barriers, for example, restricting attendance at early morning MDT ward rounds. Participants raised governance-related concerns, including quality assurance processes, student welfare considerations, and indemnity arrangements, particularly when students spent extended periods working with other professionals or across multiple sites. While induction activities, including training on standard operating procedures, were recognized as essential, they were also seen as reducing time available for IPE. The need to ensure equitable learning experiences for all student pharmacists was discussed in this context, with informal IPE highlighted as a relevant consideration.

Theme 3: reconsidering existing approaches to IPE

Subtheme: emphasizing a longitudinal learning pathway

Participants emphasized the importance of embedding IPE as a core priority across all stages of pharmacy education. Introducing IPE as a foundational concept at the very start of the MPharm program ("from day 1") and ensuring its consistent integration throughout the academic curriculum, including experiential learning (EL), was viewed as critical in shifting away from a narrowly uniprofessional mindset characterized as "pharmacy, pharmacy, pharmacy." This approach was perceived as facilitating a gradual and natural transition toward collaborative professional practice and establishing clear expectations that IPE should be incorporated across all placement experiences. Recent

revisions to GPhC standards, specifying that by 2026 all pharmacists in the United Kingdom will qualify as independent prescribers at the point of registration, were regarded as timely enablers of this strategy, supporting a continuous trajectory of interprofessional learning across the 4-year MPharm program and into the Foundation Training Year [6]. One participant further noted that such an approach aligns with broader professional development pathways extending beyond initial qualification, including the Royal Pharmaceutical Society's credentialing frameworks for advanced and consultant-level pharmacists [24].

Subtheme: requirement for improved coordination and alignment

Enhanced collaboration was consistently identified as essential for strengthening IPE provision. EL facilitators reported minimal awareness of the IPE activities student pharmacists completed on campus, as well as limited knowledge of learning experiences undertaken during earlier placements. This lack of continuity was perceived as a barrier to developing a coherent and progressive learning structure. One participant suggested that insight into how student pharmacists engage with and act upon placement feedback—particularly how feedback is used to inform ongoing professional development—would be beneficial. Administrative challenges were also raised, particularly regarding the timing and adequacy of information provided by universities. Several EL facilitators described receiving placement-related information approximately 6 weeks in advance, which constrained their ability to coordinate IPE activities with interprofessional colleagues. Delays in receiving post-placement feedback were identified as an additional concern.

Participants highlighted that close collaboration among interprofessional practice teams is fundamental to the successful implementation of future IPE initiatives. One participant described how structured IPE involving multiple student groups could be facilitated by interprofessional staff appointed to education and training roles within health boards. However, concerns were expressed that organizing and delivering such activities extended beyond the current remit of EL facilitators, with participants noting that additional training resources and financial support would be required should this responsibility expand. Further issues related to IPE facilitation were raised, particularly the need to clearly define and differentiate learning outcomes for students from various professional backgrounds.

Proposed enhancements to PFEL training included the incorporation of IPE-focused case studies and the active involvement of practice educators from other professional disciplines in workshop delivery. Peer review and peer-support sessions were viewed as valuable mechanisms for strengthening attention to IPE and collaborative practice. EL facilitators described the benefit of exchanging examples of effective placement activities, which was perceived as supporting less experienced facilitators while simultaneously reducing duplication of effort and alleviating workload pressures.

This study examined stakeholder perspectives on the organizational structures and operational processes underpinning IPE within EL placements for student pharmacists in Scotland, drawing on insights from academics, practice educators, and EL facilitators. Analysis of participant discussions generated themes addressing current practice ("what is happening"), effective elements ("what works"), and areas requiring reform ("what needs to change") to enhance interprofessional learning and support the implementation of new IPE initiatives. Collectively, the findings illustrate the complexity and evolving nature of learning environments within EL placements, identifying both challenges and opportunities that can inform future development.

One prominent finding was that the majority of IPE experiences were informal or opportunistic, typically involving interaction with qualified health and social care professionals. Only a small number of examples of intentionally designed IPE activities involving students from multiple disciplines were reported. While these findings underscore the need for more deliberate planning of structured IPE initiatives, they also highlight the importance of optimizing learning derived from informal interprofessional encounters. Previous research demonstrates that such unplanned experiences can play a meaningful role in developing collaborative competencies. Kent and colleagues explored informal IPE opportunities in which preregistration students observed interprofessional consultations in clinical environments, reporting positive educational outcomes and concluding that unstructured IPE can effectively support learning during practice-based placements [25]. Similarly, Zhao and colleagues found that undergraduate speech pathology students perceived informal interprofessional encounters as valuable learning

experiences, with implications for collaborative skill development [26]. However, these authors also identified missed learning opportunities when students and supervisors failed to recognize the interprofessional learning potential of informal situations [26]. Within the Biggs 3P framework, this teaching–learning dynamic (3P: Process) intersects with all 3 overarching themes and several subthemes identified in the present study.

Participants noted the absence of explicitly defined IPE learning outcomes within EL handbooks (3P: Presage). Nisbet and colleagues emphasize that clearly articulated interprofessional learning outcomes, alongside profession-specific objectives, are essential for supporting collaborative competency development and for signaling that IPE is an integral and expected component of the curriculum during placements [15]. Making IPE outcomes more visible—particularly when linked to assessment—would clarify institutional expectations for both EL facilitators and student pharmacists, encouraging a shift away from a predominantly uniprofessional orientation (3P: Process). Participants also highlighted limited student understanding of professional roles (3P: Presage). The Centre for the Advancement of Interprofessional Education's IPE Guidelines stress the complementary relationship between campus-based and practice-based IPE; strengthening campus-based IPE may enhance student pharmacists' knowledge, skills, and confidence, which could, in turn, increase EL facilitators' trust in students' readiness to engage in interprofessional activities [18]. Greater awareness of the relevance and value of IPE may also motivate student pharmacists to adopt a more proactive approach to learning and to actively seek out interprofessional opportunities during placements (3P: Presage).

Regulatory influences—including institutional requirements, government contractual frameworks, and governance arrangements (3P: Presage)—were identified by participants as factors that may restrict opportunities for informal IPE and therefore require clearer guidance. For example, greater flexibility in placement schedules, such as allowing attendance at early-morning multidisciplinary team (MDT) ward rounds, was viewed as a practical means of reducing lost interprofessional learning experiences. Participants also recognized that embedding a learning continuum (3P: Process) supports informal learning by facilitating cultural shifts at both individual and organizational levels (3P: Presage).

Overall, participants expressed favorable attitudes toward IPE and collaborative practice; however, they also acknowledged obstacles that may prevent these positive beliefs from being consistently enacted in practice (3P: Presage), aligning with previous findings. Ong and colleagues [27] reported that clinician educators across multiple health disciplines perceived IPE as potentially reducing efficiency in patient care delivery. Similarly, O'Carroll and colleagues [28] identified meso-level (administrative and leadership) and macro-level (political and institutional support) influences as key determinants of successful IPE and collaborative practice implementation. They further highlighted misunderstandings about the nature of interprofessional learning as contributors to limited IPE provision and missed educational opportunities [28]. In the present study, participants noted that sector-specific attitudes toward IPE and collaboration could negatively shape student pharmacists' learning through adverse role modeling (3P: Presage). The literature describes this phenomenon as part of the "hidden curriculum" [12, 29–31]. Thistlethwaite and colleagues [32] characterize this as the transmission of implicit norms, values, and beliefs through immersion in clinical environments. Participants suggested that targeted training initiatives could help reshape the culture surrounding EL facilitation broadly, as well as IPE facilitation specifically (3P: Presage).

The limited availability of formally structured IPE activities reported by participants underscores the need to strengthen practice-based EL curricula by intentionally incorporating planned IPE experiences involving learners from diverse health and social care professions (3P: Process), supported by facilitators trained across professional groups (3P: Presage). Poirier and Newman [16] describe IPE delivery as frequently fragmented and advocate for a more integrated, strategic framework. Participants in this study emphasized that collaboration is central to developing sustainable, planned IPE initiatives, highlighting the importance of coordination between universities, placement providers, and MDTs. Such alignment was viewed as a way to address logistical challenges, including student scheduling and placement organization (3P: Presage). These perspectives are consistent with earlier research indicating that successful implementation also depends on securing funding for facilitator development and ensuring adequate coverage for teaching and training responsibilities [13, 33]. Participants expressed uncertainty regarding learning outcomes for students from other professional disciplines

and concern about their capacity to facilitate meaningful learning experiences (3P: Product). A mapping study by Steven and colleagues [34] demonstrated substantial overlap in expected outcomes and standards for undergraduate health care students in the United Kingdom, despite the absence of a shared set of IPE learning outcomes. Developing such common outcomes could represent one pathway toward advancing interprofessional mentorship [34].

A notable strength of this study lies in its qualitative design, which enabled detailed exploration of stakeholder perspectives. Furthermore, the application of systems theory supported examination of multiple interacting factors and their interrelationships. However, the Scottish context of data generation limits the generalizability of findings to other settings. Challenges associated with data collection during the COVID-19 pandemic may have constrained participant recruitment, raising the possibility that data saturation was not fully achieved and that some stakeholder viewpoints were underrepresented. Nevertheless, the findings both reinforce and extend insights from earlier Scottish research [13]. Future investigations should incorporate the perspectives of student pharmacists and actively involve a broad range of stakeholders, including professionals from different disciplines, in the co-design of IPE activities and educational resources. Although not all transcripts were independently reviewed by two researchers, several strategies were implemented to reduce researcher bias and enhance the trustworthiness of the findings.

Conclusion

By examining the structures and processes underpinning IPE during experiential placements for student pharmacists in Scotland, this study determined that most interprofessional learning occurs informally or arises opportunistically through individual EL facilitators. While stakeholders identified several challenges, they also highlighted meaningful opportunities for improvement. The insights generated provide a robust platform to guide future initiatives aimed at fostering effective and sustainable interprofessional learning during placements.

Acknowledgments: None

Conflict of Interest: None

Financial Support: None

Ethics Statement: None

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