RESEARCH DIRECTIONS

Evaluation of a Single Interprofessional Learning Workshop in Undergraduate Healthcare Education: Perspectives from Students and Educators

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Abstract

Interprofessional collaboration in healthcare professionals promotes patient-centred care. Interprofessional learning (IPL) in undergraduate healthcare curricula aims to improve effective collaboration between students from different professions to promote patient-centred medicine. The challenge of how we prepare students for interprofessional collaborative practice raises the question of what educators and students perceive in the value of IPL as a promoter of patient-centred collaborative learning.

A workshop on safe prescribing was co-created within an interprofessional group of colleagues from the MPharm and MBChB Programmes, involving fourth-year students. Following the workshop, students and educators completed a survey comparing their perspectives on IPL's value in engaging students in experiential collaborative learning.

Of 81 MPharm and 59 MBChB students, 33 (41%) and 32 (54%) completed the survey respectively. Students and educators acknowledged the value of the IPL workshop in increasing awareness of other professional roles, skills development, and importance of teamwork in patient care. Educators perceived the workshop as having the goal of improving patient care. MBChB students viewed the activity as an opportunity to learn skills and MPharm students as improving their professional development. However, there was a lack of correlation between students' perceived benefits of the IPL workshop to themselves and patient care.

MBChB students perceived IPL as exchanging competencies, not enhancing interprofessional practice, even though they thought IPL benefited healthcare professionals and interprofessional caring benefited patients. MPharm students, on the contrary, viewed IPL as promoting interprofessional practice and recognised the importance of multidisciplinary teams to improve patients' care. The lack of student awareness that IPL sessions are the first steps towards interprofessional collaboration and enhanced patient-centred care could be a barrier to embracing collaboration as professionals after graduation. Educators should emphasise this point to students as part of the learning outcomes of IPL.

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Introduction

Interprofessional learning (IPL) in health-related fields offers an authentic opportunity for undergraduate students to benefit from cross-disciplinary collaborative learning (Barr et al., 2017). The World Health Organisation views IPL as a "necessary step in preparing a collaborative practice-ready health force" (WHO, 2010), by developing healthcare students into future interprofessional team members (Bridges et al., 2011) who deliver safe and effective patient care (Reeves et al., 2007). Therefore, a prime focus of IPL is to promote patient-centred learning through encouraging students from different professions to collaborate and provide them with the skills and knowledge necessary to work effectively as part of a healthcare team (Doherty, 2018). To advance this ambition universities are being encouraged to adopt and maintain cross-cohort collaborative interprofessional learning (Jorm et al., 2016) across all pre-qualification learning environments (Roberts and Kumar, 2015).

However, collaboration does not always occur naturally or effortlessly and is important to define how IPL can prepare students for collaborative practice (Neubauer et al., 2024). Collaboration is not just about sharing learning, communicating with each other and making agreements, but about bringing effective change, creation and synergy (Green and Johnson, 2015). It is not unusual to find a discrepancy between educators' and students' perceptions of collaboration (O'Carroll et al., 2015), raising the question of how much awareness and consensus exists among educators of the different typologies of collaboration and IPL (Reeves et al., 2018). Having a committed educators' team willing to learn from colleagues (and students) to develop IPL activities is therefore paramount. Practice educators should be included in the team to enable as authentic an experience as possible in the classroom setting and keep the focus on patient safety (Barr et al., 2013). Such a team will demonstrate positive role modelling during the session through successful facilitation leading to enhanced future practice (Bridges et al., 2011) and is reported to positively correlate with student engagement (Curran et al., 2007). Though IPL provides undergraduate students from different healthcare programmes opportunities to work collaboratively on shared clinical tasks that place the patient in the centre of focus, it is difficult to determine whether these opportunities will effectively lead to the development of collaborative practice (Gilbert, 2005).

The effectiveness of IPL is dependent on the ability of gaining awareness of each other's role and responsibility, share objectives and work co-ordinately to achieve them together (Mnaymneh et al., 2021).

An IPL workshop was developed to include two healthcare programmes within the College of Health and Life Science at Aston University: MPharm and MBChB. Both the General Pharmaceutical and Medical Councils advocate IPL and require graduates to be competent in safe and appropriate prescribing, and to be aware of the common causes and consequences of prescribing errors. Prescribing errors are the largest source of medication error, with common identified causes being lack of exposure to the topic and inadequate communication between healthcare professionals (Rothwell et al., 2012). Dornan et al. (2009) described the EQUIP study, where patient safety improved through minimising prescribing errors, the intervention being IPL in undergraduate studies. Safe prescribing was therefore identified as a suitable theme for the IPL workshop involving fourth-year MPharm and MBChB students.

Literature on undergraduate IPL primarily assesses students' expectations and rates of satisfaction from these sessions (Chua et al., 2019; Courtenay, 2013). However, there is a paucity of work exploring how students' perceptions of the value of IPL compared with educators' perspectives on designing a successful IPL experience. This is an important factor as aligning students' perceptions with educators' perspectives ensures a more effective teaching and learning process and enhances the overall educational experience (Könings et al., 2014; Amerstorfer and Freiin von Münster-Kistner, 2021). We created opportunities for educators to design, deliver and evaluate the workshop. This study aimed to assess the impact of a single IPL workshop on students' perceptions of interprofessional collaboration, teamwork, and its relevance to patient-centred care, while also

exploring educators' perspectives on designing and delivering such workshops. Additionally, we sought to examine how different participating professions assess the success of IPL.

Methodology

Workshop design and delivery

The workshop on safe prescribing was co-created with teaching practitioners from the MPharm and MBChB programmes. The tasks were inspired through colleagues' experiences in practice and the need for students to work together and learn from each other, highlighting the roles and responsibilities when in practice. All the educators had experience of facilitating in-class interprofessional workshops, of working with other healthcare professionals in practice but had not engaged in IPL as undergraduate students themselves. The educational approach incorporated the key principles identified by van Diggele et al. (2020) for successful IPL. The tasks were designed to ensure students understood the roles of each profession and to meet patient needs. Prior to the workshops, students were provided with preparatory materials to familiarise themselves with the topics, ensuring they were prepared to engage actively. Educators acted as facilitators during the workshop, prioritising guided discussion over lecturing and encouraging students to engage in experiential learning by completing prescribing tasks and participating in facilitated discussions to share their expertise and knowledge. Small-group teaching was integral to our design, as it fosters better student engagement and interprofessional learning (Barr et al., 2017). In particular, the workshop incorporated peer learning, recognising the benefits of students teaching and learning from one another (Nisbet et al., 2008). The success of the workshop was assessed through mixed-group responses, accuracy checks, and feedback provided by educators, ensuring the workshop achieved its purpose.

Four identical workshops were delivered in a classroom, each consisting of approximately 35 students and four teaching staff (two from each profession). Students worked on three tasks (i) preventing medication errors case study, (ii) medicines reconciliation and (iii) prescribing for discharge (**Figure 1**). Seated at tables, the students worked in mixed groups of 6-8 on all the tasks, with each group typically comprising four MPharm students and three MBChB students.

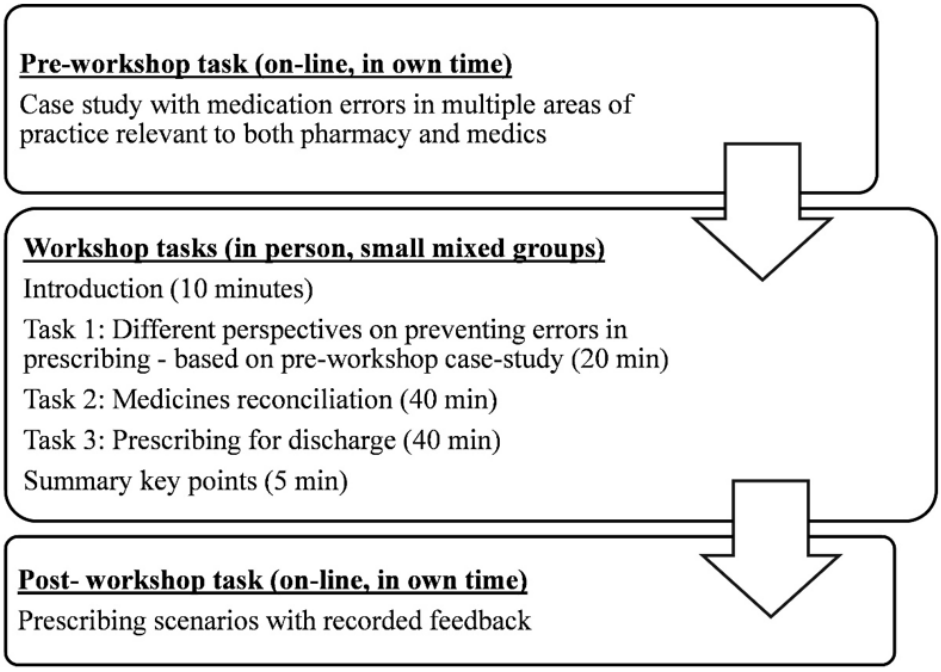

Figure 1 Workshop overview

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A pre-workshop task was provided for individual review of a case study on preventing medication errors. During the workshop, students from both Medicine and Pharmacy worked together to complete 3 tasks on prescribing errors, medicines reconciliation and prescribing for discharge. Post-workshop students consolidated their learning through individual prescribing scenarios.

Data collection

Quantitative and qualitative data were collected from students and educators by a post-workshop online survey, available for four weeks between November and December 2021.
Students were asked to respond to 10 closed items, using a 5-point Likert scale ranging strongly agree to strongly disagree, reflecting on:

1. Importance of working together for patient care
2. Increased awareness of other professional roles
3. Value of teamworking in the IPL workshop

The closed questions (Q) were inspired from previously published studies evaluating IPL: the Interdisciplinary Education Perception Scale (McFadyen et al., 2007) and the Readiness of health care students for IPL (Parsell and Clarke, 2019).

Students were asked to provide three descriptive words to define the workshop and to respond to five open-ended questions including what they had learnt from, and taught, their peers from the other professional programme.

Educators were asked to respond to 5 open-ended questions exploring:

1. Learning with, from and about each other professional courses
2. Perceptions of students' engagement
3. Impact of IPL in practice and sharing good practice

Data analysis

Quantitative data were analysed using descriptive statistics (SPSS, version 26; Prism 9.5). Pearson's correlation test was used to analyse students' responses to the Likert scale closed items. The student responses to the 10 closed items were given a numerical value in ascending order from 0 for strongly disagree to 4 for strongly agree. Responses were tabulated with the column headers being the questions and the row headers being the participant number. Comparison between MBChB and MPharm student responses was by Fisher's Exact Test. A probability (p) level of <0.05 was considered significant. Qualitative data were analysed using thematic analysis (Braun and Clarke, 2006,2019). The responses were pooled for MPharm and MBChB and were read by all researchers to familiarise themselves with the data. Two researchers individually read through the responses and coded for similarity, contrasting points, topics that were stated as beneficial and anything of particular interest for each researcher. The team met and identified the main themes that emerged from the data.

Ethical considerations

This study was reviewed and approved July 2019 by the Health and Life Sciences Ethics Committee, Aston University reference #1496 for Interdisciplinary Education at Aston.

Results

Students' perceptions of IPL workshop

Of the 81 MPharm students and 59 MBChB students, 33 (41%) and 32 (54%) completed the online survey respectively. **Figure 2** shows students' perceptions of the values and benefits of the IPL workshop, providing opportunities to reflect on their peers' roles and fostering the development of effective working relationships.

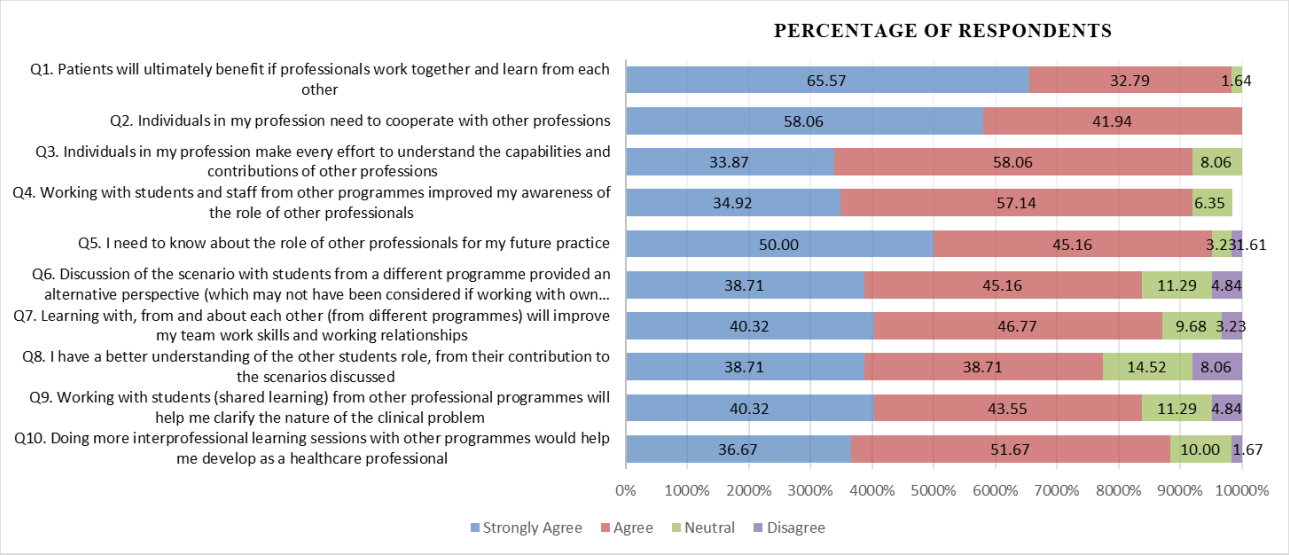

Figure 2 Students' perceptions from the single IPL workshop

A post-workshop survey evaluated students' responses and identified the following themes: importance of working together for patient care (1-2), increased awareness of other professional roles (3-5), value of teamworking in the IPL workshop (6-10). None of the students selected the 'Strongly disagree' category for any of the themes.

There was a statistically significant difference in responses between MBChB and MPharm students to five of the questions as shown in **Table 1**.

Question	Learners	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	*p*
1	MBChB	71	25.8	3.3	0	0.027
	MPharm	60	40	0	0	
4	MBChB	40.6	50	9.4	0	0.039
	MPharm	30	66.7	3.3	0	
5	MBChB	59.4	37.5	0	3.1	0.004
	MPharm	40	53.3	6.7	0	
6	MBChB	37.5	40.6	21.9	0	<0.0001
	MPharm	36.7	46.7	3.3	13.3	
7	MBChB	37.5	53.1	9.4	0	0.030
	MPharm	43.3	40	10	6.7	
10	MBChB	37.5	46.9	12.5	3.1	0.015
	MPharm	35.7	57.1	7.1	0	

Table 1 Comparison of MBChB and MPharm student responses to questions.

Comparison between MBChB and MPharm student responses analysed by Fisher's Exact Test. The table shows the questions for which there was a statistically significant difference between learners on each Programme. A probability (p) level of <0.05 was considered significant. The 'strongly disagree' domain' has been excluded from the table because there were no responses for this category. Full questions listed in **Figure 1**.

A greater proportion of MBChB students than MPharm students strongly agreed that "Working with students and staff from other programmes improved my awareness of the role of other professionals"

(Q4, p =0.0386) whilst more MPharm students agreed (rather than strongly agreed). This trend was also the case for responses to “I need to know about the role of other professionals for my future practice” (Q5, p = 0.004) for which some MBChB students also disagreed with. The statistically greatest difference in responses were for the question “Discussion of the scenario with students from a different programme provided an alternative perspective” (Q6, p < 0.0001) with the differences coming from a proportion of MBChB students neutral and 13.3% of MPharm students disagreeing. A proportion of MPharm students also disagreed with the question “Learning with, from and about each other (from different programmes) will improve my teamwork skills and working relationships” which was also a question where MBChB and MPharm students responded differently (Q7, p = 0.0304). MBChB and MPharm students also responded differently to the question “Doing more interprofessional learning sessions with other programmes would help me develop as a healthcare professional” (Q10, p = 0.0153) with a proportion of MBChB, but no MPharm, students disagreeing. Despite these whole cohort differences, individual students mostly agreed or strongly agreed with all statements, often tending to answer the same way for each question.

For the most part there was a high degree of significant correlation in student answers to each of the 10 questions (**Table 2**). However, there were some exceptions, the most notable being the answers to Q1, “Patients will ultimately benefit if professionals work together and learn from each other”. Whilst there was a significant positive correlation of responses with Q1 and Q2 (p<0.01), Q1 and Q5 (p<0.05), Q1 and Q8 (p<0.05), there was no significant correlation between the responses with Q1 and questions 3, 4, 6, 7, 9 and 10. The questions with a lack of correlation to Q1 tended to be the ones about the benefits of the workshop itself, rather than about the benefits to the profession. There was a correlation between students who regarded the IPL workshop as beneficial to professional practise and those who believed interprofessional medical practise benefits the patients. But the lack of correlation between students who regarded the IPL workshop as beneficial and those that thought patients will benefit if professionals work together, suggests that the students could not associate IPL with patient-centred care even though they thought IPL benefitted the professional healthcare workers and that interprofessional caring benefitted the patients.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q1	-	**	ns	ns	*	ns	ns	*	ns	ns
Q2	**	-	ns	ns	**	*	*	*	*	*
Q3	ns	ns	-	****	*	**	**	*	*	***
Q4	ns	ns	****	-	*	**	**	*	**	***
Q5	*	**	*	*	-	**	**	**	**	*
Q6	ns	*	**	**	**	-	****	**	****	**
Q7	ns	*	**	**	**	****	-	**	***	**
Q8	*	*	*	*	**	**	**	-	***	*
Q9	ns	*	*	**	**	****	***	***	-	**
Q10	ns	*	***	***	*	**	**	*	**	-

Table 2 Correlations between students Likert scale answers

The student responses to the 10 questions were given a numerical value: Strongly disagree – 0, Disagree – 1, Neutral – 2, Agree – 3, Strongly agree – 4. Absolute numbers of student responses were provided for each question. Responses were tabulated in Prism 9.5 with the column headers being the questions and the row headers being the student ID. The columns were analysed by Pearson’s correlation test. ns= non-significant positive correlation; * p < 0.05, ** p < 0.01, *** p < 0.001, **** p < 0.0001. Questions Q1 to Q10 are listed in **Figure 2**.

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Students' descriptive words of the workshop were grouped in 5 themes in order of prevalence (figure 3):

1. Engaging (engaging, interesting, thought-provoking)
2. Instructional (informative, educational)
3. Pertinent to their practice (relevant, helpful, good for practice)
4. Promoting working together (collaborative, teamwork)
5. Design and delivery (organised, communicative, staff-friendly)

Theme 4 only emerged as a second (N=2/32, 6.25%) or third descriptor (N=4/27, 14.8%).

Figure 3 Students' descriptive words to define the IPL workshop

Both students and educators highlighted the importance of shifting the workshop's focus toward fostering genuine collaboration, rather than primarily concentrating on task completion:

I thought the session was more aimed to teach us how to prescribe in terms of the technicality of prescribing and writing forms (Participant 28– MBChB)

Make sure students consider the principles underpinning the session, not just using the session as a technical exercise (Educator-1)

The same themes emerged from both educators and students when considering the impact of the IPL workshop on learning with, from and about each other, and included 'increased awareness of other professional roles', 'insights of team working in practice', 'complementary knowledge and skills development' and 'importance of working together for patient care' (**Table 3**).

Theme	MPharm Students	MBChB Students
Increased awareness of other professional roles	*Helped me understand more the role of doctors in prescribing (participant 49)* *Learned different ways to undertake the question [task] from a pharmacists' point of view (participant 60)*	*More aware of the role of pharmacists in clinical care (participant 10)* *Taught each other different responsibilities and jobs of pharmacists and medics (participant 3)*
Insights of team working in practice	*Both professions must work together in synergy and communicate with others effectively (participant 51)* *Improves relations, helps me to understand how to work in a multidisciplinary team (participant 56)*	*What a doctor can and can't do (participant 8) and how patients are clerked in hospital (participant 16)* *More awareness of role of other members of the multidisciplinary team (participant 18).*
Complementary knowledge and skills development	*Using my pharmacy knowledge, I was able to go through certain medications and explain how they worked (participant 37)* *Taught them how we look at problems from a pharmacy perspective and how we piece information together (participant 33)* *Helped them understand what we are looking out for and how we piece information together (participant 33)*	*Consolidating what they already knew about the indications of certain drugs and potential side effects (participant 19)* *I am more aware of how pharmacists are crucial for patient discharge drug summaries and medicine reconciliation (participant 3)* *We had more depth of information about the pathology itself, while they had more insight about a more detailed management plan regarding to medications to be used (participant 2)*
Importance of working together for patient care	*Facilitates having better communication with other healthcare professionals during placements (participant 51) and gives a better perspective of what multidisciplinary teams look like in real life (participant 64)* *Mixed workshops allow for future generations to be confident with each other and reduce stigma (participant 38)* *Understanding each other's roles and responsibilities help towards working better as a team (participant 33).*	*Will help me appreciate other healthcare workers and be aware of their essential contribution to the health of patients (participant 2)* *Importance of working together for the good of the patient (participant 3)* *Reinforces that we are all working to ensure patient safety (participant 14)* *Better understanding of each other's roles allowing for better patient care (participant 16)*

Table 3 The value of working with students from another healthcare programme

Participant responses regarding what they learned from, and taught each other, and the impact this has had on their perception of placement.

Regarding learning gain, MBChB students felt that learning with MPharm students improved their technical skills on prescribing, whereas MPharm students felt that learning with MBChB students enhanced the importance of working together as part of a multi-disciplinary team (MDT) contributing to patients' care and safety:

How to prescribe properly and fill out information on the prescription chart (Participant 2- MBChB)

What information they like to get from us and how we can work together as a team (Participant 33-MPharm)

Errors associated with different professions in the MDT (Participant 41-MPharm)

Their roles both overlap and differ with our roles within healthcare, and both must work together in synergy (Participant 50-MPharm)

When asked what they had taught their peers when sharing their ideas or experience, students reported enhanced awareness of their roles and approach to prescribing:

Different ways to undertake the question from a pharmacist's point of view (Participant 59-MPharm)

Different responsibilities and jobs of pharmacists and medics (Participant 3- MBChB)

Importance of working together for the good of the patient (Participant 3- MBChB)

The learning that the educators gained from each other, aided facilitation through awareness of similar ideas and challenges of prescribing in practice, as well as engaging the students in the tasks. Educators felt the workshop was an opportunity for cross-collaboration and working together mirrored practice as they felt were part of a MDT:

It just mirrors practice (Educator-2)

Felt I was back working at the hospital (Educator-3)

Discussion

Literature shows that students have a positive attitude towards teamwork and collaboration (Williams et al., 2015). Our students described the workshop as both educational and engaging, but interestingly the collaborative aspect was not perceived as a primary benefit. Despite being widely acknowledged as useful and desirable, interprofessional collaboration necessitates a more thorough comprehension of its underlying causes and impacts (Neubauer et al., 2024), and this was reflected in the present study from the students' data and from educators' perceptions. It appears that the educators had 'fallen into the trap' of associating IPL to shared learning, which involves different professions learning together, but in the absence of collaboration (Hill et al, 2019). Overall, students' and educators' perceptions of the level of engagement were positive, and the shared learning from this workshop, still provided students with some benefits, because they felt they had learnt from each other and had more awareness of each other's roles. However, we could argue how much of the shared learning resulted in in-depth creation and synergy when completing the tasks together (Hill et al., 2019).

We identified a misinterpretation in the perception of the collaborative aspect from the workshop. Both the MPharm and MBChB students perceived they contributed equally to the groupwork activities by sharing their knowledge around management of clinical diseases and by achieving a sense of multidisciplinary working. However, MBChB students acknowledged MPharm students as providing them with the necessary technical skills on prescribing and did not report any learning around

teamwork; whereas MPharm students recognised the medical students as promoters of a cooperative approach to task completion and did not report any learning around prescribing. This may have been sufficient and a desired outcome for the students, ensuring they received the knowledge they felt they needed to complete tasks. Hypothetically the workshop was designed with an emphasis on the pharmacology aspect of prescribing, what looked like a collaboration was in reality a 'mask of co-operation' (Iliffe, 2008), with a unidirectional exchange of knowledge. This may reflect why MPharm students disagreed more than the MBChB students that the workshop provided new perspectives. And a possible reason for medical students not perceiving the workshop as a learning opportunity for collaboration may reflect their exposure to clinical placements early and throughout their programme compared to MPharm students, having more opportunity to interact with healthcare staff (Viscardi et al., 2022), potentially feeling more confident in aspects of collaboration. This may be why the MBChB students were more inclined than the MPharm students to disagree that the workshop would help them develop as healthcare professionals.

Students acknowledged the importance of working with other professions to achieve a positive outcome on patient's care but could not associate this collaborative aspect to the value of the IPL workshop. This was further supported by the students' attributes of the workshop as an informative opportunity rather than a collaborative one.

Since our students were at advanced stages of their programmes, the aim of the IPL workshop was to promote a full 'immersion' in participating in interprofessional problem-solving tasks, rather than gaining awareness of each other's roles (Hudson et al., 2016). There is evidence that students towards their final years might be ready for a full immersion in IPL as they should have developed their own professional identity to help them appreciate the value of interprofessional problem-solving activities (Hudson et al., 2016). However, it has also been shown that patient-centred collaborative attitudes tend to decrease among undergraduate students towards their later years, particularly among those who had more placement experiences, such as our medical students (Rosewilliam et al., 2019). Another factor lies in the educators' perception of the meaning of collaboration and how this was received by students. It is not unusual to find a discrepancy between educators' perceptions and observed levels of collaboration, raising the question of how much awareness and consensus exists among healthcare educators for the effective requirements of IPL (O'Carroll et al., 2015).

During the planning of the workshop, the educators felt they were working in an MDT, able to reflect on their clinical experience. All educators had clinical experience of working in MDTs, but they lacked IPL experience as undergraduate students. Interestingly, among students the term 'multidisciplinary working' emerged as a recurrent subtheme when describing the impact of the IPL workshop on their practice. Therefore, there was a concordance between educators and students, in perceiving the IPL opportunity as promoting multidisciplinary working. In reality, 'interprofessional' implies that professionals collaborate with each other by integrating their knowledge and skills and by using teamwork principles; whereas 'multidisciplinary' refers to professionals from different disciplines working alongside, but in parallel, so that each profession still remains in a silo without much interaction (Margalit et al., 2009). In our IPL workshop the MPharm and MBChB students worked as if in an MDT, working towards the solution of the same problem but within their own silos, by making profitable use of each other's knowledge rather than developing those skills together.

Limitations of the study

This study has some limitations such as the small number of educators, and the educators' perspective did not benefit from a peer's observation of the workshop.

Conclusion

Students valued the IPL workshop as an opportunity for sharing learning, enhancing MDT working and increasing awareness of other professional roles that contribute to their practice. Yet, the intended promotion of collaborative learning was probably misinterpreted as an exchange of

competencies. Whilst the students could see the benefit of interprofessional collaboration to increase awareness of the roles of different healthcare professions they did not link IPL with interprofessional collaboration or increased patient-centred care. Achieving patient-centred care has been linked to the adoption of interprofessional collaboration (Dahlke et al., 2020) and so this lack of appreciation that IPL leads to patient-centred care could present a barrier to perceiving IPL as an important introduction to adopting interprofessional collaboration. This challenge has also been recognised by Neubauer et al., (2024), who proposed the "multi-stage multi-causality" model for implementing IPL sessions, which emphasises the need for a better understanding of interprofessional collaboration as the fundamental metric, separate from the immediate outcomes of interprofessional education, ultimately leading to improved patient-centred care. Educators could see the link, and this mismatch between students and educators' perceptions highlights the challenge of healthcare educators to translate their clinical experience of interprofessional collaboration into the classroom environment. This should inform future IPL sessions to use a simulated environment, consider additional peer observations from external educators and follow-up the students to learn if, or how, they applied IPL to their practice.

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