Educational Article

Integrating the assessment of interprofessional education into the health care curriculum

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Abstract

In this article, we reflect on some of the challenges associated with assessment in interprofessional education (IPE) by describing the experiences at one UK-based medical school. The assimilation of IPE into pre-registration health and social care training demonstrates recognition of the importance of teamwork and collaborative practice to advancing high-quality, safe patient care. Working collaboratively requires the integration of professional understandings as support based on mutual trust and respect. The uniqueness of every patient requires professional flexibility and adaptability, making interprofessional working complex. Assessing professionals on these complex behaviours is, therefore, challenging. Our approach began with the early adoption of a portfolio, which was helpful. However, wide faculty support was required to manage feedback. With further integrated interprofessional learning, multiple formative and summative assessments were placed into existing examination structures. The development of this local work is continuous, on-going and in no way complete. We share limitations and future opportunities.

Keywords: Assessment; Collaborative work; Health care curriculum; Interprofessional education; Portfolio; United Kingdom

Introduction

Health and social care professional curriculum developers at the pre-registration (undergraduate) and post-registration (post-graduate) levels are continuously trying to assimilate
new learning within existing curriculum content. For example, in medicine, there has been a recent extension to cover the clinical significance of genetics. For more than twenty years, there has been a steady rise in the teaching method known as interprofessional education (IPE), where students from different professions come together.\(^8\) IPE, as outlined in 2002, “occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care.”\(^9\) Becoming an interprofessional practitioner requires relevant knowledge, skills, attitudes and behaviours relating to aspects of team functioning and collaboration with colleagues in practice. As a result, learning outcomes associated with IPE often relate to concepts such as the dynamics of teamwork, interprofessional communication, patient-centred decision making, care planning, ethical values associated with collaboration and understanding interprofessional reflection.\(^4,5\) These new learning principles must be integrated within the core curriculum to avoid overload in terms of existing teaching content and, similarly, assessment burden. As with any teaching activity, this new content must be aligned so that learning outcomes can be assessed to determine if learning has occurred.\(^6\)

Both students and teachers understand what is meant by assessment. For motivated students, being tested offers an opportunity to show what they have learnt and compare their abilities to those of their peers. Teachers gain invaluable insights into what the students understand, allowing them to highlight those concepts that remain difficult-to-understand and master. Within health professional education, learning is about not only the assessment of knowledge but also the application of this knowledge using skills that are demonstrated through professional behaviours in a practice setting. Perception of these differences in student understanding and application requires different types of assessment. Written tests usually identify knowledge, while practical examinations show how knowledge is demonstrated as skills and behaviours. In addition, students are required to acquire positive feedback at their clinical placements, which adds to the body of evidence concerning their suitability for professional body registration, which is affirmed by higher educational institutions.

Today, the theoretical stance that the majority of health care curricula follow is the behaviourist outcome model approach. This approach is rooted in the work of early behaviourist psychologists such as Skinner and colleagues, who theorised that learning occurs following repetition to stimulus-response mechanisms that can be measured through observation.\(^7\) Much of health care has followed the behaviourism approach, where measurement of behaviours is integrated into a competence framework that is applied to a curriculum to produce an assessment matrix. Writing for medicine in the 1990s, Miller was one of the early proponents of this method.\(^8\) Despite the simplicity of his approach, he stated that “no single assessment method can provide all the data required for judgement of anything so complex as the delivery of professional services by a successful physician” ppS63.\(^8\) The framework that he described (Figure 1) outlines a trajectory to building professional ‘competence’, beginning with the development of knowledge (‘Knows’), followed by the ability to apply knowledge (‘Knows How’), then performance (‘Shows How’) and, finally, professional action (‘Does’). This progression is often weighted against Bloom’s taxonomy of learning outcomes, which shows how understanding becomes increasingly more sophisticated, from the novice to the expert.\(^9\) Despite this myriad of testing possibilities from written examinations through observed practical behaviours within objective structured clinical examinations, as Miller notes, it remains impossible to know how well an individual will perform when faced with patients in clinical contexts. The ability to use competence as a means of assessment continues to prevail because it offers valid and reliable assessments for large cohorts and can be easily organised (i.e., early knowledge tests followed by observation of practical skill sets and, finally, performance). However, there are many who believe that this theoretical stance lacks the ability to show how student use their knowledge and skills in the complex area of health and social care. For this reason, some IPE educators have chosen to adopt the capability framework.\(^10\) Within medical education, others are asking for the design of ‘entrustable professional activities’ and ‘patterns of human performance’ that align more closely with professional practice and the collaborative stance concerning how professionals relate to others to support and advance care.\(^11,12\)

Eraut was one of the first to write about the challenges associated with the assessment of IPE, as he reflected upon the theoretical perspectives of assessments used in health and social care professional education.\(^13\) He outlined the background and theoretical stance of competence but went on to consider testing for ‘Capability’, stating:

“It provides evidence of knowledge needed for practice and evidence of professional thinking, both of which added to assessors’ confidence that performances observed in one context might be transferable to others. It also provides evidence of a critical approach to practice and a flexible mind, which would enable a person to adapt to change and to become a proponent of change and a creator of new professional knowledge” (Eraut, pp134).

Over the last twenty years, educators who develop IPE at the undergraduate/pre-registration stage differ in their adoption of the competence or capability framework. On the one hand, competence has become popular, as it can be easily aligned with the set of learning outcomes and is the choice of most undergraduate/pre-registration programmes. However, capability, which can be tested in the work setting, is preferred by others and, in our view, might be more suited to the early post-qualified period (Table 1). Each group of health and social care professions who come together to form an IPE curriculum must decide their own approach, which might be influenced by the professions involved.

The assessment of interprofessional learning

The starting position remains the same; to align with the curriculum content IPE assessments that are meaningful, test what they claim to test and are feasible. Valid and feasible IPE assessments remain challenging because IPE may
When adopting an assessment framework and matrix for IPE, leaders should consult the respective professional body requirements of the participating professions. In general, there is strong agreement that assessments should cover four learning areas:

- **Values/ethics** for interprofessional practice: The respect shown between different practitioners and the ability to place the patient as central in all aspects of their care pathway.
- **Roles/responsibilities**: There must be knowledge of the respective scopes of professionals within the local context of practice.
- **Interprofessional communication**: How the practitioner communicates within a professional team, involves the patient, carer and family and collaborates with professionals beyond the immediate team and, sometimes, with other care sectors.
- **Teams and teamwork**: Understanding of the theory and practice relating to how people work together to form and sustain an effective team.\(^5\)

In the UK, a recent guide by the UK Centre for the Advancement of Interprofessional Education (CAIPE) reemphasised the importance of assessed interprofessional learning (IPL), suggesting that both ‘formative’ and ‘summative’ assessment processes should be used.\(^14\) Formative assessment offers early feedback to students to ensure that they know what is expected and receive feedback concerning how to advance their learning, which, in turn, offers insights to the teacher. Summative assessment adds to the weighted standard for individual students and is incorporated within the final pass or fail grade for progression. Assessment, therefore, begins with formative feedback and progresses to summative outcomes.

### The integration assessment of interprofessional learning in a UK medical curriculum

Leicester Medical School commenced its journey to aligning IPE with the core curriculum in 2002, launching the first cohort in 2005.\(^15\) The IPE curriculum was agreed across ten schools, and the curriculum model required the integration of assessed learning from the outset and was held together by a professional portfolio. All participating health and social care students were expected to use this portfolio but each profession could adapt and adopt the content based on the requirements of their respective professional bodies. The opportunity to research the use of this portfolio was included in the ethical permission granted for the evaluation of the local IPE curriculum. This included interviews with students and, in this case, consent to access and use student written work as data for analysis.\(^6,17\) The portfolio was a common assessment completed by all participating professions, yet it was unique in its construction and elements. We describe here the design of the assessment trajectory as applied to the

![Framework for Clinical Assessment, (Miller 1990)](image_url)

**Figure 1:** The framework for clinical assessment.
medical students both in the use of the portfolio and with other assessment formats.

All medical students were informed during induction week about the IPE curriculum and the assessment journey and were given their portfolio (Initially a physical entity, it became an e-portfolio in 2012). In the main assessment strategy, the assessment of interprofessionalism was placed alongside the assessment of professionalism, as is often the case for IPE. The content included a combination of formative and summative components, testing the four areas of competence documented above and aligned with the GMC curriculum guide (Table 2).5,20

All participating student professionals were expected to complete short, reflective, written accounts of their interprofessional learning (IPL) events. The first introductory event provided an early formative assessment opportunity. The written reflections were read by a team of medical academics and returned with individual and overall group cohort feedback. Using content and thematic analysis to assess student writing revealed where students struggled to analyse and reflect meaning from learning and showed new interprofessional knowledge and skills to take forward and the early formation of mainly positive attitudes (Box 1). The findings confirmed that students often felt anxious and nervous before their first IPL event. Subsequently, in years two and three, early clinical IPL involving patients included a second formative assessment in the form of a case study. This written work contained clinical content and analysis of both student experiences of working in a student team and patient experiences of professional collaborative care. Here, teams of clinical teachers read and offered individual feedback, and we engaged students in the marking or rating process using peer and self-assessment techniques known to enhance student learning. This helped in the management of the volume of written work during a period of increased student numbers (related to the addition of a graduate medical school) as such case studies require thorough reading. Despite the students’ engagement in reading the outputs, many preferred the detailed individual written feedback from teachers. The use of interprofessional student peer and self-assessment requires further research for use in an interprofessional context, as it is primarily applied and

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<tr>
<th>Year</th>
<th>Formative assessment</th>
<th>Summative assessment</th>
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<tr>
<td>One</td>
<td>Formative (portfolio)</td>
<td>Written reflection on competence (knowledge, skills and attitudes) from early interprofessional workshop on introduction to teamwork for their portfolio</td>
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<tr>
<td>Two</td>
<td>Formative (portfolio)</td>
<td>Written reflection on a formal IPE course involving a patient case for their portfolio</td>
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<td>Three</td>
<td>Summative</td>
<td>End of phase 1 examination, including SBAs and SAQs to test knowledge</td>
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<tr>
<td>Four</td>
<td>Formative (portfolio)</td>
<td>Junior rotation of clinical placements: mental health: two-day interprofessional workshop involving patients. Completion of a case reflection for their portfolio</td>
</tr>
<tr>
<td>Four</td>
<td>Summative</td>
<td>Intermediate professional examination SBAs and SAQs to test knowledge; clinical examination; OSCE stations with viva’s on team-based management</td>
</tr>
<tr>
<td>Five</td>
<td>Formative (portfolio)</td>
<td>Workshop and simulation on patient safety: written reflective essays as part of student’s IP portfolio</td>
</tr>
<tr>
<td>Year 5 final examinations</td>
<td>Summative</td>
<td>Final examinations: SBAs and SAQs; OSCE: e.g., clinical management of a discharge involving other professionals’ stations</td>
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Table 1: Frameworks used for IPE.

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understood within uniprofessional teaching. At the end of the two and a half years of pre-clinical work comes the summative end of phase one examination. Here, IPE knowledge concepts were included within single best answer (SBA) and short answer question (SAQ) papers to test their knowledge of the theories of teamwork as well as their understanding of the professional roles and responsibilities and related aspects of professionalism (Table 2).

Throughout the curriculum, the intention of any IPE assessment was to align the core profession-specific knowledge with interprofessional understandings. Within the clinical years (three, four and five), students were assessed on their professionalism within each block by their consultants, which included teamwork and collaboration in the community and inpatient settings. Within some of these blocks, there are additional formal interprofessional experiences. For example, within the mental health block, there is a two-day IPL event involving patients focussed on interprofessional care planning. Students formally reflect on this experience within their formative portfolio, including their learning about other professionals involved in patient care.

Early IPE experience reflection examples

**Knowledge:**
‘I learnt that effective communication involves professionals with different expertise’
…it made me think about the importance of challenging stereotypes, as all members of a healthcare team are equally important, even though they carry different roles and responsibilities.
I...at this point, I did not know much about the role of a speech and language therapist and so did not know the value of the work of the field. This soon changed.’

**Skills:**
‘It made me think of how to include everyone in the team at the start of interprofessional working. Putting in a small amount of time at the beginning of the session to get to know each other meant people were more likely to have confidence to voice their opinions later, leading to a more productive work environment. This could lead to better patient care in the long run because more ideas and concerns about a treatment will be raised, meaning the patient could receive [a] better level of care.’
‘I tried to listen to the opinions of everyone in the group.’

**Attitudes:**
‘I began to feel more comfortable, seeing that we were all equally nervous and inexperienced. Appreciating the fact that everyone was experiencing similar feelings.’
‘Bringing us all together meant that we could better understand and identify with members of the so-called out-group...this breaks down prejudice early on.’
‘I feel this...has been an eye-opening experience...I now see there is much to be done to achieve this [integrated care].’

Conclusions

In this paper, we have shared some of the current challenges associated with the assessment of IPL and shared the assessment matrix as applied to a local curriculum. From the early beginnings of establishing an IPE strategy, the participating professional leads recognised the importance of assessment. The curriculum theme inspired them to develop critically reflective students who were capable of thinking differently about rapidly changing modern care design and delivery. The curriculum included learning about professional alliances for safe practice, instruction on how to form effective teams and opportunities to explore and experience coordinated and collaborative practice. In terms of agreeing ‘how to assess’, the planning group came to the conclusion that our only starting position was a shared method that was easily acceptable to all professions; a portfolio. It was understood that other additional assessments would be required both for the shared IPE curriculum and within the fabric of the core profession-specific curriculum. In medicine, the additions were more formative written case studies, group work and the inclusion of content within existing summative knowledge-focussed written examinations and in the observation of skill sets in OSCE stations. We have yet to agree on a second shared assessment method that is common to all participating student groups.

The portfolio was common but different. Some students had the early booklet as a stand-alone portfolio, while other students who already carried a portfolio, for example nurses, placed the interprofessional sections within a larger document. Progression over the years to e-portfolios has resulted in booklets becoming invisible and rarely seen by other students. However, this technology better prepares students for the e-
interface used in on-going professional development such as revalidation in medicine.33 The final analysis of the portfolios confirmed the benefits and outcomes.30

The choice of a portfolio and the reliance on traditional assessment methods such as written papers and OSCEs have limitations. In regard to written reflections, reading 240 student entries per learning event is time-consuming, making it challenging to offer individual feedback. Some students have challenged the formative outcomes that were graded for progression across broad boundaries of unsatisfactory, satisfactory or excellent. Checking for consistency across a small numbers of marker illuminates the subjective perspectives and interpretations of individual markers on what constitutes a meaningful reflection. Nevertheless, offering this early writing platform has proved to be extremely helpful and enables educators to determine if students can reflect critically and apply meaning.30

It is widely recognised that the modalities of SBSs, SAQs and OSCEs fail to fulfil the possibilities of identifying medical professionalism.31 It is also recognised that portfolios do not offer a valid and reliable alternative.32 More research is needed on mini-CEX as applied to IPE and the potential to obtain multi-source feedback, including assessments from patients and members of a clinical team. The new tools such as the iTOFT offer opportunities for further research and possible validated tools on which to build robust feedback mechanisms. Work-based assessments offer new challenges concerning faculty development and the need to offer regular updates on interprofessional learning for our clinical colleagues’ teaching in practice. Running IPE master classes for this purpose has become part of our local curriculum work and remains essential for clinical-based assessments.33

We have reported that changes to our IPE curriculum have come about through evaluation processes that considered student assessment.15 This has resulted in shorter reflections and additions such as assessments of student presentations. We acknowledge that, as is true with others, there is not an agreed-upon minimal interprofessional standard and no gold standard assessment for this level, and so our attempts might be misguided. The introduction of new simulations has posed new issues regarding whether we should assess an individual within the team and/or the team as a whole. Some simulations have complex clinical content, and it remains easy to focus on correct interventions at the expense of not focussing on interprofessional working. In all our attempts, we acknowledge that behaviours manifest only when working in truly complex and realistic teams in real practice settings.

Discussion

Perhaps it is not surprising that the development of robust assessment methods for IPE is in an early phase. There are a plethora of questions to be addressed concerning ‘when’ the timing is right within a curriculum, ‘what’ agreement can be reached on competence or capability and ‘how’ written and practical tests or other strategies can be used. In addition, the management of large volumes of student work makes ‘do-ability’ a top priority, followed by staff training. Robust IPE assessment remains the next step for IPE as we draw closer to understanding high-quality theoretically informed teaching design.34

Research continues to offer more possibilities for the design of student assessment tools and the testing of methods such as professional portfolios (iTOFT).27,28 A group of authors is gathering evidence through a process of consultation with IP leaders to compile a consensus statement on the assessment of IPE, which is forthcoming.35 This will mirror the consensus statement offered for the assessment of professionalism that was so easily aligned with that of IPE because of the complexity involved in stating who has reached the required minimum standard for progression to registration.31 However, until the governing bodies place greater emphasis on the testing of interprofessional learning, IPE assessments will be dwarfed by profession-specific content.

The need for healthcare staff who are effective team members and can collaborate is not new. The Lancet Commission in 2010 examined the need to transform health care education, and its second proposed reform has enshrined the need for interprofessional education for generic competencies.36 While the pace of the interprofessional education movement has quickened over the last two decades, we need to think carefully within and across schools about how we assess our students’ readiness and ability to collaborate when in practice.

Recommendations for planning the assessment of IPE

- Start with curriculum alignment and build an IPE assessment matrix
- Ask questions of capacity and capability relating to how the assessment process will be managed reflecting on approaches that may be worth pursuing
- Use methods that are easily acceptable across professions such as an adaptable e-portfolio
- Involve students and patients from the outset
- Underpin the assessment with a theoretical stance
- Build a picture of student learning over time using formative and summative cycles
- Ensure faculty development to help practice staff to learn how to integrate IPL within core uniprofessional learning
- Build a knowledgeable IPE assessment team who can energise new possibilities for sustainable IPE assessment

Conflict of interest

The authors have no conflict of interest to declare.

Authors’ contributions

ESA and DK jointly agreed to provide this reflective piece. Both participated in the writing of this article and contribute to this topic within the named university. Both authors have critically reviewed the final draft and are responsible for the content.

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