Development of interprofessional workstreams to support interprofessional learning in an undergraduate nursing programme

Marian Traynor[1] and Billiejoan Rice[2]

Abstract: Collaborative learning is increasingly recognised as essential in ensuring the delivery of safe and effective healthcare. It is fundamental to creating the healthcare teams of the future. Central to this, is the early exposure of healthcare students to multiple healthcare professions to begin the process of thinking and practicing in a more interprofessional way. Thus, after reviewing the literature, an interprofessional module was developed and implemented within an undergraduate nursing curriculum in one university in the UK, consisting of ten interprofessional workstreams to support students' exposure to other professions. This paper describes the implementation process, the assessment component, and addresses the evaluation of the process from both the student and teacher perspective. It aims to provide guidance for other educationalists who may wish to implement a similar programme and to encourage further discussion about the possibilities for the development of a model for interprofessional education and practice.

Keywords: interprofessional education; collaborative learning; assessment

1. Professor and Associate Dean of Education, Faculty of Medicine Health and Life Sciences, Queen's University Belfast
2. Senior Lecturer, School of Nursing and Midwifery, Medical Biology Centre, Queen's University Belfast

Address for correspondence: m.traynor@qub.ac.uk

Introduction

Interprofessional education has the potential to significantly impact learning by positively influencing the behaviour and skills sets of the learners. This reflects the definition of Interprofessional Education (IPE) by the WHO:

> "*Interprofessional education occurs when two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes*" (WHO, 2010, p.7) and is the definition produced by the Centre for the Advancement of Interprofessional Education (CAIPE), a global leader in promoting and delivering IPE (CAPE, 2002). Furthermore, there is much evidence supporting IPE as a conduit to enhancing and improving, quality of care (Barr, 2002; Institute of Medicine, 2003; Prevention Education Resource Centre, 2006; World Health Organisation, 2006; Buring, 2009; Reeves et al, 2013; Hearth et al, 2017; Riskiyana et al, 2018).

Against a background of extensive research on the benefits of IPE there still exists significant challenges to its implementation. For example, Grace's (2021) review of interprofessional education reports on the major barriers that exist to fully integrate an interprofessional curricula, arguing that IPE remains on the margins of health curricula. Herath et al (2017) also reported on diversity of approaches to IPE with many extorting the need for change.

This is despite the known benefit of exposure to IPE (Barr,2005; Lappin et al ,2013). A systematic review (Reeves et al, 2016) revealed that students, who had participated in IPE activities, reported that it impacted positively, and they gained many benefits including improvements in their attitudes and understanding towards other professionals. There are reports of an increasingly positive impact on students who are exposed to IPE that includes evidence of improvement in attitudes, and an increase in knowledge and skills. For example, a study conducted in Sweden (Wilhelmsson et al, 2013) examined recent nursing graduates from a university which incorporated IPE strategies at various levels in the curriculum and compared this to two other universities which used non-IPE curricula and more traditional methods. Using a survey method, nurses' perceptions of preparedness for their profession, and in particular their ability to collaborate with other professions, was analysed. Results showed that graduates from the IPE university perceived that their programme of study had prepared them to work effectively with other professions in comparison to graduates from non-IPE universities (Wilhelmsson et al, 2013).

Several systematic reviews of IPE conducted over the past ten years have varied inclusion criteria which range from a Cochrane review of IPE studies using randomised controlled trials (RCT's) (Zwarenstein et al, 2009; Reeves et al, 2010b), to more methodologically inclusive reviews (Cooper et al, 2001; Reeves, 2001; Barr et al, 2005; Hammick et al, 2007). These reviews have contributed to the body of knowledge that IPE impacts positively resulting in changes in learners' attitudes towards other professions; improvement of knowledge of IPE partnership; enhancement of collaborative behaviour; and gains in delivery of patient care (Reeves et al, 2010b).

Turrentine et al, (2016) found that students involved in IPE learn in a more meaningful way acknowledging that that the effectiveness of a collaborative, interprofessional experience of education helped them integrate more effectively into interdisciplinary clinic teams and increased their understanding of each other's role. This was also found in the research by Joyal et al (2015) who investigated the interprofessional knowledge skills and attitudes of health sciences students' (nursing, medical and pharmacy), who came together for an overnight (12-hour), simulated, hospital ward shift. A pre-test-post-test survey design was used for this study. Students who completed the 12-hour shift reported that they were eager to learn in interprofessional settings, and that this experience provided opportunity to deepen their understanding of how different professions interact. They also reported gaining more confidence and a better understanding of other professions' role

In considering the benefits of interprofessional education it is also important to reflect on the number of high-profile reports into failures in health and social care. For example, in the UK the Mid Staffordshire NHS hospital scandal culminated in the Francis Inquiry (Francis 2013); Concerns over breast cancer care provision at Solihull Hospital resulted in the Solihull Hospital Kennedy Breast Care Review (Kennedy 2017). Gosport Independent Panel Report (DHSC, 2018) was set up to address concerns raised by families, over a number of years about the initial care of their relatives in Gosport War Memorial Hospital and the subsequent investigations into their deaths and finally, The Hyponatraemia Report (Inquiry into Hyponatraemia-related deaths Northern Ireland (ihrdni), 2018) investigated 'negligent care' which culminated in the deaths of nine children All of these major incidents have contributed to diminishing levels of public confidence and trust in healthcare and all have highlighted problems with communication and collaboration between professionals that has resulted in poor outcomes for patients.

This has culminated in several professional bodies to require evidence of IPE in their respective curricula. For example, within the United Kingdom the professional regulator for nursing, the Nursing and Midwifery Council (NMC) in their 2018 Standards for pre-registration nursing education state that:

> " Registered nurses must be able to work as an equal partner with a range of other professionals, and in interdisciplinary teams" (NMC, 2018, p. 3).

Similarly, the professional regulator for medicine in the UK, the General Medical Council (GMC, 2016) confirm that the clinical learning environment is multiprofessional and a successful learning environment will support learners across all professional groups.

More recently the General Pharmaceutical Council (GPHC) in the UK requires that collaboration will play a more important role with experiential learning and interprofessional working with students from other healthcare professions playing a key role in attaining the full set of learning outcomes (GPHC, 2021).

To deliver on the requirement that IPE is a core competency in nurse curricula, nurse educators must understand, include, and maximize IPE in their pedagogy and optimize opportunities for innovative IPE opportunities. IPE must extend beyond joint lectures and move to meaningful IPE activities that provide an opportunity for participatory engagement with other professions. This was the vision held by the module leads who sought to develop interprofessional workshops to support an interprofessional module. There was early recognition however that the integration of inter-professional workshops to support the IPE module required support at all levels, from administration to faculty staff, digital developers, and the learners.

Background

The need to implement IPE in an undergraduate nursing curriculum has been a discussion point for some time and whilst there were some significant IPE projects, there was no explicit IPE compulsory module until the recent 2020 nursing curricula. The current curricula saw the inclusion of a new IPE module: "Interprofessional working". This module is in year three of the BSc (Hons) undergraduate nursing curriculum. The module is a core

module undertaken by approximately 500 nursing students. The module runs twice during the calendar year as the university supports two nursing intakes per year. Within the module students attend six core lectures on: (1) Communication, (2) Human factors in healthcare, (3) Teamworking, (4) Interprofessional teams, (5) Managing conflict, (6) Reflection, and are also expected to participate in at least one interprofessional workshop. The assessment for the module required the student to submit a video recording of their reflections on the interprofessional learning activity via the online platform Canvas.

The design process

Drawing upon experience associated with the implementation of an online admissions system, a team was established with colleagues from academia, digital learning support and professional services (education). The team collaborated on sourcing and establishing the interprofessional education (IPE) streams, as well as working on designing and integrating an online video within a digital platform and streaming all students to at least one interprofessional stream.

The priority was to bring together the right people with the right skills sets to manage the project. From the outset, there was a need to have a shared understanding of the module and its complexities, and to work together to collectively help support the pedagogy to shape student learning and provide the best educational experience.

A particular focus of the team's first meeting was a discussion around the reflective component, and the requirement for students to record a video relaying their reflective commentaries. It was agreed that students would answer three questions, designed to guide their reflections. Video reflections are not a new educational tool; however, the requirement for the tool to be embedded in a digital platform, easily accessible to students, was new. At the time, there did not exist a functionality within the university digital learning platform (Canvas) to deliver on this request - a function that would enable students to complete and upload their reflective video commentaries within the Canvas platform.

The module leads recognised that they had limited experience developing a video platform to support the online reflective commentary therefore, professional guidance was sought from colleagues in the

Digital Learning (DL) support team. Two staff members from the DL directorate joined the team and were pivotal in providing expert guidance on the video functionality, building the design in collaboration with the module leads. By doing so, they produced a well-designed final product that met the needs of the module, was functional and was appropriate for the assessment. As with all successful design processes, there was a need for regular dialogue between faculty staff and the design team and this was facilitated through weekly meetings with the team. Through these meetings, we worked with our DL colleagues to have a mutual understanding of the requirements of the module and, in particular the reflective video assessment component.

Module assessment

The original assessment for the module was a 1500-word reflective assignment; however, following a review of the types of assessments across the year three curricula, the module leads discussed the advantage of having more diversity within the student assessment portfolio, mindful that a variety of assessment practices can support student learning. Biggs' model of constructive alignment underpinned our philosophy and is defined as "coherence between assessment, teaching strategies and intended learning outcomes in an educational programme" (McMahon & Thakore 2006). Given the interprofessional focus of the module, the learning outcomes, and the requirement to collaborate with other professionals, an opportunity to provide a reflective account by speaking about the experience was identified as an appropriate assessment for the student. The assessment method would also meet the student requirement of enhancing digital technology skills and build confidence speaking formally on camera. This is a skill that healthcare professionals are increasingly using in community practice placements, conducting virtual visits with patients via digital platforms such as zoom or Teams, and providing healthcare access to those who live remotely or have difficulty attending hospital appointments.

Three reflective questions were constructed to guide the video assessment:

Question 1:
In what way do you feel your exposure to other professionals has impacted your

thinking as a nurse? Max 2.5 mins

Question 2:

What skills or knowledge acquired on the IPE module have you used/ will you use the most? Please give examples if possible. Max 2.5 mins

Question 3:

What would you regard as a worthwhile outcome of nursing students participating in IPE activities? Max 2.5 mins

To ensure all students had an equitable opportunity in terms of technical requirements, the option to complete the video assessment on campus was also available. There was much discussion that began with "what if?" which proved very beneficial to help articulate the many queries that might arise from students and resulted in the creation of an online FAQ resource.

It was important to ensure that students understood the terminology and that the instructions were clear and easily accessible. Step-by-step guidance was provided through written instructions, and a video tutorial was developed that demonstrated how to complete the video reflection using the Canvas platform. These instructional elements were also made available for students to access at any time during the assessment and therefore provided an enhanced supportive and inclusive student experience.

Under the guidance of our DL colleagues, the team was fully invested in ensuring that the end product, the video-based reflective commentary, would promote and enhance the learning process for students; this was evident in the number of modifications made in the strive to deliver excellence. It was also evident in the feedback received from the students:

"I had no difficulties with the instructions and uploading of video. Found the video instructions very beneficial prior to starting recording." (Student)

The discussions and collaborations resulted in the design of a video-based assessment embedded within the digital platform accessible to students via the Canvas platform.

IPE workshops

The IPE workshops were developed through consultation with a number of key faculty staff and aimed to increase the opportunity for students to

participate in IPE activities. The coordination of the IPE workshops was dependent on faculty staff developing and leading on the IPE initiative. The ability to deliver on this was a significant challenge for the module leads. Creating and running IPE activities is notoriously complex and can present several challenges (Nelson et al., 2014). Within the faculty, there already existed staff with a profound interest in expanding the IPE provision available to students, and they were highly motivated to collaborate on developing more IPE streams. The resultant collaboration resulted in four new IPE activities to complement an already established six.

The ten IPE activities are referred to as IPE Streams and are listed in Table 1.

Table 1
IPE streams

IPE Pharmacy & Medication Safety: Nursing/Medical /Pharmacy
IPE Infant Feeding: Nursing/Medical
IPE Perioperative Emergency Medicine: Nursing/Medical/GEMS
IPE Simbaby: Nursing/Medical
IPE Ethics: Nursing/Pharmacy
IPE National Institute of Clinical Excellence (NICE): Graduate Entry Nursing/ Pharmacy **
IPE Pharmacy Simulation workshop : Nursing/Pharmacy. **
IPE Schwartz rounds: Nursing/Medical **
IPE Pharmacy Children: Nursing/Medical
IPE Drug Calculations: Nursing/Pharmacy **

** denotes new IPE Streams developed to support the module)

Each stream had an academic lead. There were regular meetings between each lead and the module leads, to provide support and get updates on the development of each IPE stream. This included reviewing the learning outcomes for each of the IPE streams; the number of students each stream could accommodate; the date and the venue for the IPE activity. To put this in context, some of the IPE activities were delivered online and others face-to-face. Once these were finalised, the next stage was to allocate all 500+ students to an individual stream, being mindful that not all streams

were suitable to all fields of nursing. This was led by the Professional Services (Education) members of our team.

The IPE workshops follow a set methodology that involves providing students with information on the IPE activity in advance, followed by a period of debrief and reflection. As an example of an IPE activity the IPE Schwartz stream is an opportunity to participate in IPE Schwartz rounds. The IPE Schwartz rounds with its emphasis on storytelling and students having an opportunity to reflect on the impact of highly pressurised and emotive situations, has motivated the staff involved to consider how Schwartz rounds can be utilised more widely across nursing programmes. Schwartz rounds are named after Kenneth Schwartz, a lawyer who died of lung cancer who recognised the emotional cost to staff of caring for very ill and dying patients, and the importance of staff being able to tell their story to their emotional wellbeing. The IPE Schwartz streams are co-facilitated by a medical and nurse academic. The theme for the IPE Schwartz is shared with the students in advance, for example "A patient I'll never forget". Students volunteer to be one of the story tellers and are advised that they have a maximum of 5 minutes each. They tell their story one after the other i.e., two medical students and two nursing students sharing. They are advised that it's all about the story, and to make it as narrative as possible. They are also told that the main focus is to describe the emotional impact experienced as part of the story, the idea being to take the group with them, so it's as if they were there in a particular moment, and most importantly, tell them how it was for the individual to experience that. Currently there are plans underway about progressing inter-field nursing Schwartz rounds. This would bring together nursing students from the adult, mental health, children and young people and learning disability fields to share their stories within Schwartz rounds.

A further example of the IPE activity is the online IPE Drug Calculations with nursing and pharmacy students, and this was hosted on MS Teams. The rationale for placing this activity online was due to limited room availability in the university for small group work. Using MS Teams, students met together, and facilitators introduced the session presenting principles of drug calculations, with worked examples, and the aim of interprofessional working. Students were then placed into breakout rooms, and this worked well, reducing the need for multiple room bookings in the university. Students were aware that cameras and microphones must be working and switched on to enable full participation and discussion of varied calculations. Facilitators were able to move between breakout rooms

ensuring there were no difficulties.

Preparing students and providing information on the allocated stream, prior to participation, is essential to ensure students feel motivated to learn and psychologically safe to do so. Edmonson (2018) states that both psychological safety and intrinsic motivation are equal partners. Psychological safety needs to be coupled with intrinsic motivation for participants to be willing, not only to take the interpersonal risks of learning, but to keep striving to do better, and to keep pushing team members to follow. This was achieved by providing clear information on the IPE activity in advance of participation. Facilitators addressed students during semester induction weeks outlining the aim and objectives of IPE. This was followed up with an email in advance of their allocated date, providing written instructions on how to join, and reminding participants of the aim, objectives, and requirements of the workshop.

On the day of the workshop, facilitators spent 5-10 minutes at the beginning, to provide an introduction to ensure that students felt comfortable and motivated to learn. Practices adopted to create psychological safety were aligned to Edmonson's (2018) recommendations: setting the scene; clarifying the nature of the activity, framing the point of learning. This involved emphasising the purpose, which is to practise and advance knowledge of drug calculations and working together, problem-solving together, communicating effectively, respecting, and learning more about each other's role. This impacts on building confidence with cohesive working practices which are vital for clinical practice. Furthermore, all facilitators leading workshops had attended training on how to conduct an effective pre-brief and debrief, ensuring psychological safety and motivation to learn.

Debriefing, after an activity or simulated experience, was a central tenet of the IPE workshops. The debriefing session afterwards affords students reflection time on the experience, where gaps in knowledge and areas to improve upon are identified. Buykx et al (2011) allude to consolidation of theory into skills; demonstration of clinical and professional skills in a protected environment; immediate feedback and supporting inter-professional work. This process of practice and feedback can help students develop confidence and competence prior to delivering care in real practice settings.

A debriefing model designed by the Scottish Centre for Simulation and Clinical Human Factors (SCSCHF), (SCSCHF, 2014) was used in the workshops. (Figure 1). It consists of stages, beginning with the students'

reactions on completion of the activity which are written down by the facilitator or displayed on a white board, or flip chart.
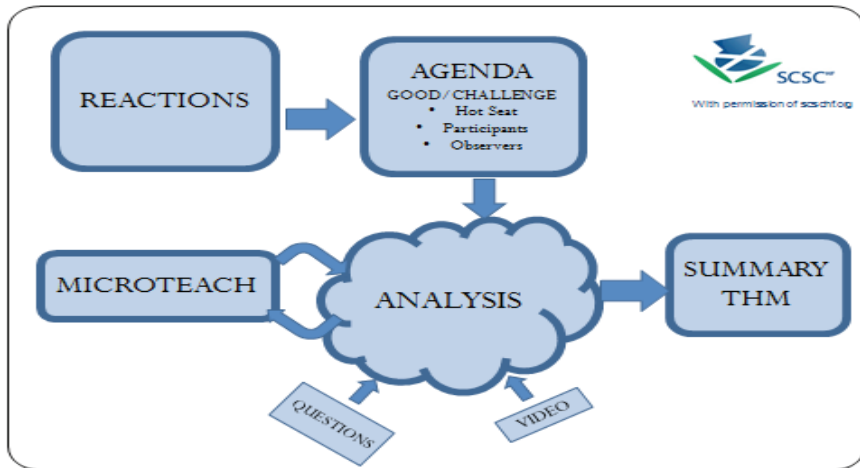
The agenda is set by identifying elements of good practice and any challenges encountered. Participants and observers contribute to this discussion followed by a period of analysis. The analysis may encompass questions, discussion, and some microteaching of key issues which participants may be unsure of. Key points from the debrief are summarised and a 'take home message' is provided (SCSCHF, 2014). All the IPE workshops followed the same preparation and incorporated a detailed debrief utilising the SCSCHF (2014) debrief model.

Decker et al, (2013) purport that best practices in debriefing support the use of a model as opposed to a freestyle approach. Currently, there is a wide spectrum of acceptable approaches for debriefing, but the SCSCHF (2014) was deemed most applicable as it was structured, easy to recall, and captured initial reactions which is an important area to highlight to guide key learning, from the activity.

Professional support for the module

Those members of the team working to deliver the coordination and digital support were pivotal to the success of the module as they allocated students to the correct IPE stream, remaining cognisant of all the variables associated with the allocation, (only students from specific fields of nursing could

participate in certain IPE streams). The IPE streams ran at different times across the academic year; students had to be timetabled at a time that did not interfere with their regular academic timetable, and two cohorts of nursing students had to be accommodated. Given the significant numbers (n= >500) that were being allocated, this was an enormous organisational task. A system was set up that enabled the administrator to check the allocation with the module leads prior to it going live. The e-learning developer within the school then received the list of students and then uploaded these to the digital portal with a submission date for the student to complete. Also, the submission dates had to be staggered, as they had to map to when the student engaged in the IPE workshop. These team members, often invisible in delivering effective education curricula (Macleod et al. 2017), were core to the smooth operation and successful timetabling of all 500 students to the ten streams and were pivotal to the successful implementation of the new assessment.

The module leads met with the Professional Services leads and E-learning developer every 2-4 weeks to identify any potential risks and provide reassurance around the student allocations. These meetings provided an opportunity to resolve any issues that might cause concern. Resolution of any issues early ensured that progress was maintained.

Module evaluation

The team recognised that providing students with an opportunity to provide feedback was essential. We had developed an evaluation questionnaire. The 17-item questionnaire incorporated three Likert scales, plus two either/or answers, and two questions on digital device/browser. The questionnaire also had ten qualitative "free response" questions to allow candidates to elaborate, expand, clarify or illustrate their answers. The questionnaire was embedded in Microsoft Forms and students were provided with a link to the questionnaire after they had completed the reflective video-based assessment. The analysis was completed using simple descriptive statistics

In addition to the questionnaire results, we also had access to the number of support cases logged by students when they were completing the video assessment. The top two trends that emerged for support cases: (1) video taking too long to upload (2) video link expired before the student had completed. Since the team had early access to this information, we were able to take immediate action. In the early days of the module 31% of students

encountered technical issues however this figure has gradually decreased as the module has evolved. Most students reported that they used their own personal devices to complete and upload the video submissions. Most of the qualitative comments referred to problems with the video upload time:

"First two videos uploaded perfectly, the third one was temperamental and required several attempts"

"it was a very different approach which I enjoyed in comparison to an assignment or an exam. It was quite appropriate for the module."

"Much better than a written assignment, thank you!"

"would rather had an assignment, found it very difficult to put my point across in 2.5minutes and didn't really feel like the question was being answered."

 Other comments related to the nature of the assessment:

"I found that this type of assessment interesting and easy to navigate and once I had a few tries I really didn't feel as nervous as I thought I would. I think it would be a beneficial method of assessment where it is hard to convey thoughts and feelings in a written document, where tone and inflection are hard to interpret." The online evaluations indicated that 80% of respondents rated the ease of use of the written instructions provided as very easy or easy to use. Importantly, and in addition to regular meetings with the team to evaluate progress, we had the ongoing evaluation data to quality assure that the new assessment was acceptable to the student, and we could respond to the evaluations by adding to the FAQS if necessary.

We also met with the students to get their first-hand experience of the video platform and they were mainly positive about the experience. They were helpful in their feedback around the FAQs as well as suggesting that we increase the submission time from 7 days to 12 days. A limiting factor to the evaluations is the non-responders and any future evaluations should include follow up data collection on this particular group to ensure that all views are represented.

As a result of these evaluations, we were able to improve our communication to the students and we circumvented many of the earlier issues that arose during the pilot, for example students not waiting sufficient time for video to upload that resulted in incomplete submissions. The assessment was also submitted to the School Assessment Committee and External Examiner who approved the assessment citing that it was a novel

approach.

Students may have had mixed views of the video-based assessment however student evaluations of the IPE workshops were incredibly positive with many highlighted this as an excellent experience. The IPE Perioperative Emergency Medicine (POEM) stream; the IPE simbaby stream and the IPE Schwartz stream were particularly well evaluated. Students who participated provided the following feedback: *"Good to work with nurses to learn to communicate together"* (MS); *"would love more of this"* (NS); *"very beneficial, true to life, great experience working with other professions"*.

Feedback from the IPE leads for each stream were also particularly positive about having two or more professionals represented in each workshop. *"It has been so excellent working with you over these weeks and especially, to have the nursing students involved…" (lecturer, Medicine)*

Staff involved in the assessment of the reflective video have reported on the quality of the videos and the ease with which the videos can be marked, and the marks uploaded. It has been described as a *"refreshing and a new approach to assessment"*. Additionally with the growth of AI staff have commented that the reflective video ensures that *"you are marking somebody's genuine work and it upholds academic integrity"*. A particular feature of the new assessment that is liked by staff is that the assessment fosters inclusivity and accommodates all types of learners. Importantly this suits the diverse range of students who do not always perform well in examinations or in submitting large assignments. Currently 313 students are registered with Disability Services with 41% having an SpLD diagnosis, with dyslexia being the main diagnosis.

> *"I think like chatting through still like you know your notes rather than just writing it. Like obviously my brain must, I don't know, work differently and it just connected more than just typing things." (NS)*

> *"I found that this type of assessment interesting…… I think it would be a beneficial method of assessment where it is hard to convey thoughts and feelings in a written document, where tone and inflection are hard to interpret." (NS)*

The successful embedding of a video assessment tool within the Canvas digital platform has also impacted positively on the repertoire of assessment tools available to other schools in the university and this is advertised by the Canvas team. Currently one other school is considering this type of assessment method for a module in their undergraduate programme and the template is now available to make this a feasible option.

Due to the relationship that has been developed between the National Centre for Clinical Excellence, (NICE) established when facilitating the IPE stream, that also included our graduate entry Masters nursing students, NICE is keen to maintain this relationship and in particular the Student Champion Scheme that is integral to this particular IPE stream. As a Student Champion, students can attend workshops facilitated by NICE to help in the development of peer group training so that they develop skills to deliver further sessions about NICE. This is an excellent opportunity for our students and is a direct consequence of their involvement in this IPE steam. The scheme will help students to understand the work of NICE and importantly will build on core and specialist skills to share with fellow students and raise the profile of NICE more widely amongst the student group.

A significant impact of the IPE activities was on students feeling more confident in clinical practice to speak to other professions, as result of their engagement in the IPE activities. The increased ability to speak to other professionals was a recurrent theme in the reflections as well as an acknowledgement that "*we can provide support for each other*"

Conclusion

Exposure to interprofessional education is important for student learning and has the potential to significantly impact how students engage in clinical practice. In designing interprofessional opportunities cognisance must be taken of the associated assessment to encourage interaction and reflection during and after the interprofessional activity.

As students learn to interact with students from other professions, the challenge is to embed this within curricula, and to understand the importance of how, and why, interprofessional education should be integral to all healthcare curricula.

References

Barr, H. (2002) *Interprofessional education. Educational strategies.*
(Accessed 30 Oct 2022 at http://www.nvmo.nl/resources/js/tinymce/plugins/imagemanager/files/20120926_HFDS24boekXX-2002_Barr-H_Interprofessional_Education.pdf#page=29)

Barr, H. Koppel, I. Reeves, S. Hammick, M. Freeth, D. (2005) *Effective Interprofessional Education: Argument, Assumption, and Evidence,* London: Blackwell.

Biggs J. and Tang, C. (2011) *Teaching for quality learning at university. What the student does.* 4th Edition. Society for Research into Higher Education (SHRE) and Open University Press

Buykx, P. Kinsman, L, Cooper, S. McConnell-Henry, T. Cant, R. Endacott, R. Scholes, J. (2011) FIRST ACT: Educating nurses to identify patient deterioration – a theory-based model for best practice simulation education, *Nurse Education Today,* 31, 687-693.

Buring, S.M. Bhushan, A. Broeseker, A. Conway, S. Duncan-Hewitt, W. Hansen, L. Westburg, S. (2009) Interprofessional education: definitions, student competencies, and guidelines for implementation. *American Journal of Pharmaceutical Education,* 73,4,59

Centre for the Advancement of Interprofessional Education. Interprofessional Education (CAIPE): Today, yesterday and tomorrow (Accessed 30 October 2022 a https://www.caipe.org/resources)

Decker, S. Fey, M. Sideras, S. Caballero, S. Rockstraw, L. Boese, T. Borum, J. C. (2013). Standards of best practice: Simulation standard VI: The debriefing process. *Clinical Simulation in Nursing,* 9 (6), S26– S29. https://doi:10.1016/j.ecns.2013.04.008

Edmonson, A. C. (2018) *The Fearless Organisation*, New Jersey: Wiley

Entwistle, N. (2005) Learning outcomes and ways of thinking across contrasting disciplines and settings in higher education. *Curriculum journal*, 16, 1, 67-82

Felton, A. and Wright, N. (2017) Simulation in mental health nurse education: The development, implementation and evaluation of an educational innovation. *Nurse Education in Practice*, 26, 46-52

Francis, R. Q. C. (2013) *Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry,* London: The Stationery Office.

General Pharmaceutical Council (2021) Standards for the initial education and training of pharmacists (Accessed 30 October 2022 at https://www.pharmacyregulation.org/sites/default/files/document/standards-for-the-initial-education-and-training-of-pharmacists-january-2021.pdf)

General Medical Council (2016) *Promoting excellence: standards for medical education*

*and training (Accessed 30 October 2022 at https://*www.gmc-uk.org/education/standards.asp

Grace (2021) Models of interprofessional education for healthcare students: a scoping review, *Journal of Interprofessional Care*, 35, 5, 771-783 (Accessed 01 November 2022 at https://doi.org/10.1080/13561820.2020.1767045

Herath, C. Zhou, Y. Gan, Y. Nakandawire, N. Gong, Y. and Lu, Z. (2017). A comparative study of interprofessional education in global health care: A systematic review. *Medicine (Baltimore)*, 96, 38, e7336 (Accessed 01 November 2022 at https://doi.org/10.1097/MD.0000000000007336

McMahon, T. Thakore, H. (2006) Achieving Constructive Alignment: Putting Outcomes First. *Quality of Higher Education*, 3, 10-19

Nelson, S. Tassone, M. and Hodges, B. D. (2014) Creating the HealthCare Team of the Future. The Toronto Model for Interprofessional Education and Practice. New York: Cornell University Press

Nursing and Midwifery Council (2010) *Standards for pre-registration nursing education* (Accessed 30 October 2022 at https://tinyurl.com/8fwyajfv)

Papert, S. Harel, I. (1991) *Constructionism*. New York Ablex Publishing.

Reeves, S. Perrier, L. Goldman, J. Freeth, D. Zwarenstein, M. (2013) Interprofessional education: effects on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*. 3. Art No: CD002213. https://doi.10.1002/14651858.CD002213.pub3.

Riskiyana, R. Claramita, M. Rahayu, G.R. (2018) Objectively measured interprofessional education outcome and factors that enhance program effectiveness: a systematic review. *Nurse Education Today*, 6, 73 - 8

Schon, D. (1983) *Educating the Reflective Practitioner*. San Francisco: Jossey–Bass

Scottish Centre for Simulation and Clinical Human Factors (2014) *Debrief model* (Unpublished manuscript).

World Health Organization (WHO) (2010) *Framework for action on interprofessional education and collaborative practice. (Accessed 30 October 2022 at*

https://www.who.int/publications/i/item/framework-for-action-on-interprofessional-education-collaborative-practice)