

Interprofessional research with health care students: Can it enhance students' understanding and knowledge toward evidence-based practice?

**Aim** To explore how inter-professional collaboration in the teaching and learning of research skills prepares undergraduate students for their professional roles in healthcare via an evaluation of inter-professional research modules from the student perspective. **Participants and settings** Participants were selected from a university in the North of England where all undergraduate Healthcare students were taught Research and Evidence Based Practice (EBP) through interprofessional education (n=400). **Methods** Quantitative data was collected using an adapted Attitudes Towards Interprofessional Education Scale and internally-designed pilot instruments. Qualitative data was also collected via open comment to evaluate the taught research module. **Results** 50 students completed the survey pre-module and 49 students completed the survey post-module. The participants' views towards inter-professional education (IPE) are generally positive: the median responses of 4 single-item measures assessing inter-professional learning on 7-point Likert scales were 5 or above (where higher scores represented more positive perceptions). Scores on the *Attitudes towards Interprofessional Education* scale also generally represented positive opinions, with a mean post-test score of 58.8 on a scale from 5 to 75, with higher scores indicating greater levels of positivity. No evidence for a statistically significant improvement from the pre- to post- 3rd year experience of the IPE/research theme was revealed. Qualitative data identified six themes: promoting team working, developing awareness of other health care professional's roles, polarising research and practice, multidisciplinary team (MDT) working or not working, logistical issues and developing research skills. **Conclusions** This study raised questions about the appropriateness of "unnatural" pairings for undertaking research projects. Whilst the students valued working together in the research process, they do not appear to have perceived a universal benefit to their inter-professional clinical practice.

Key words

Interprofessional education; Research; Nursing; Midwifery; Podiatry; Physiotherapy; ODP; Undergraduate

## Introduction

Health professionals need to have a thorough knowledge and understanding of research methodology to provide evidence-based care practice (Hoffmann et al., 2013). Anecdotally, many healthcare students have found research methods difficult to understand and do not see how research could enable them to provide better care for their patients. The importance of IPE for undergraduate healthcare students is well established (Lapkin et al., 2013; Reeves et al., 2013). IPE is possible when two or more different professions learn by working together

to improve health outcomes (World Health Care Organisation [WHO], 2010). IPE has been identified as an educational activity with the aim of enhancing attitudes, knowledge, skills and behaviours for (*in this case future*) collaborative clinical practice (Barr et al., 2005; Kitto et al., 2011).

One way of ensuring recognition of research and evidence-based practice is to combine research and interprofessional education (IPE) into a theme students receive in the 3<sup>rd</sup> year of their undergraduate degree. Inter-professional learning, as espoused by CAIPE (Centre for the advancement of inter-professional education, 2010) states that IPE occurs when 'two or more professions learn with, from and about each other to improve collaboration and the quality of care'. All undergraduate healthcare students at the University were taught in the classroom using a variety of methods including traditional lectures, seminars, tutorials and assessment activities inter-professionally (see Table 1). Research concepts were illustrated in years 1 and 2, with examples from different practice backgrounds. These prompted inter-professional discussion as an integral element of the sessions.

### **Insert Table 1: Summary of interprofessional learning by year.**

A literature review revealed limited evidence of the combination of collaborative interprofessional learning with research education. Lapkin, Levett-Jones and Gilligan (2013) suggested that IPE could enhance students' attitudes and perceptions towards their clinical decision-making process. Reeves et al. (2013) found that IPE could improve patient and healthcare process outcomes. However, a scoping review revealed limited research on IPE, which mainly addressed leadership training (Husebo and Akerjordet, 2016), critical thinking skills (Sooful, et al., 2020) and simulation-based training (Chaplin et al., 2018; Sanko et al., 2020). Thus, an evaluation of the students' experience of the combination of collaborative interprofessional learning with research education was planned. The study-intended to capture how students perceive that their learning and collaboration with other healthcare professionals has influenced their education; and how this has influenced their future practice. As the combination of research and interprofessional collaboration is a novel concept, it has the potential to add new knowledge within healthcare education.

Hence, the aim of this study was to explore how inter-professional collaboration in teaching and learning research prepares undergraduate healthcare students for their professional roles. The objectives of the study were: to evaluate inter-professional research modules from the student perspective; to compare the modules research and interprofessional content to other educational strategies students have experienced towards developing an understanding of research and interprofessional working; and to rate, from the students' experience, the research and interprofessional emphasis within the module.

## Methods

### *Design*

Participants were asked to complete an identical questionnaire pre- and post-module completion, comprising of a number of single item measures; an internally-produced pilot assessment of teaching and learning strategies deployed to facilitate IPL at the host institution; and the *Attitudes towards Interprofessional Education Curran et al., 2008*) questionnaire.

The single-item measures included the following statements: to which participants were asked to state their agreement on a 7-point Likert scale:

- Item 1: *Interprofessional Learning (IPL) is an essential part of an undergraduate healthcare degree, as it prepares students to work collaboratively in their clinical careers.*
- Item 2: *The inter-professional modules in all 3 years were designed to prepare the healthcare students to collaborate with other healthcare professionals.*
- Item 3: *Studying research with other healthcare students mirrors the multidisciplinary working in clinical practice.*
- Item 4: *The inter-disciplinary research modules prepared me to critically appraise evidence and to conduct audits/research in clinical practice.*

Participants were also asked to elaborate on their responses to these items using free text. The internally-produced pilot instrument was designed to allow participants to rate the following teaching and learning strategies; lectures; seminars; self-directed learning; research module and assignments; assignments specifically focused on the respondent's profession; experience of working with other health professionals in clinical practice; inter-professional workshops external to the University, and their effectiveness in facilitating their confidence, knowledge and skills for practice. For all learning strategies, ratings were requested on an 11-point scale from 0 (highly ineffective) to 10 (highly effective). An overall score of perceived effectiveness was generated from a summation of individual scores; this overall score could therefore range from 0 (teaching and learning strategies perceived to be highly ineffective) to 70 (teaching and learning strategies perceived to be highly effective).

The *Attitudes towards Interprofessional Education* scale (Curran et al., 2008) comprises of a 15-item questionnaire requiring respondents to assess the relevance of interprofessional education (i.e. shared learning involving students from more than one health care professional programme of study) using 5-point Likert-style items. Positively framed statements were scored such that responses of *Strongly Agree* scored 5 points and responses of *Strongly Disagree* scored 1 point; with negatively worded statements reverse coded accordingly. A scale score was derived as the sum of responses to individual items; hence this scale score could thus range from 15 (very low perception of relevance of interprofessional education) to 75 (very high perception of relevance of interprofessional education).

Students were also asked to provide further comment on the evaluation of the taught content of the workshop.

### *Setting and sample*

Participants were selected from a university in the North of England in which all undergraduate healthcare students (Midwifery, Nursing (all fields), Operating Department Practice, Podiatry, Occupational Therapy and Physiotherapy) learnt together interprofessionally addressing the themes of research and EBP

### *Ethical consideration*

This study was conducted after gaining ethical approval from the University to ensure protection of the participants. Participants were informed about the voluntary nature of their participation and that all collected data would be kept confidential. All participants were informed that they could withdraw their participation at any time or choose not to answer any question(s) during data collection.

### *Data collection*

Data collection was undertaken in 2017–2018, during the third year of study of a convenience sample of 400 nursing, midwifery and allied healthcare students undertaking an IPE/Research Module.

### *Data analysis*

For the internally produced instrument and the *Attitudes towards Interprofessional Education* scale, missing values of respondents who provided more than 50% valid responses were inputted using mean values. Responses from respondents who provided fewer than 50% valid responses were disregarded.

Some participants who completed the pre-module questionnaire did not complete the post module questionnaire. It was not possible to pair questionnaires; hence analysis was conducted using unpaired data. Mean scores on the internally-produced pilot instrument, and on the *Attitudes towards Interprofessional Education* instrument were determined. The precision of the difference between pre-module and post-module scores on these instruments was assessed via 95% confidence intervals; and the significance of differences in means was assessed using independent samples t-tests.

Scores on the individual items in the pre-module and post-module group were summarised using median and ranges. The significance of the difference was assessed using Mann-Whitney U tests.

As many of the comparisons were deemed to be complementary, no formal correction for multiple hypotheses were applied, but may be applied informally.

Participants were also asked to elaborate on their responses to these items using free text. These data were sorted according to question and pre/post completion before analysis. Two researchers from different professional backgrounds, podiatry and occupational therapy performed the qualitative analysis. Familiarisation preceded thematic coding and the realisation of overarching themes. Thematic analysis followed the traditions of Braun and Clarke (2006) in a staged approach to provide rigour and a structure to guide the analysis team. An inductive approach allowed understanding of the topic to develop from the data rather than test them against pre-determined theories (Blaikie, 2007; Ormston et al., 2014). To fully explore the experience of participants it was necessary to be inductive rather than deductive seeking meaning from the data rather than presuppositions. The two researchers initially worked independently and then collaboratively which strengthened credibility (Lincoln & Guba, 1985). Analysis was approached reflexively as both researchers had significant teaching roles in the IPE sessions. Both were keen to explore the honest opinion of students for the purpose of understanding and improving IPE as a teaching and learning opportunity. Whilst discussing themes and findings, the researchers actively questioned their interpretations against their roles and assumptions about this form of IPE. This led to an open interrogation of the data and trustworthy findings, enabling understanding and development of this aspect of teaching (Braun & Clark, 2006).

## **Results**

### *Quantitative findings*

Of the 400 students who commenced the 3<sup>rd</sup> year IPE/Research Module, 50 (12.5%) completed the questionnaire pre-module completion and 49 (12.5%) completed the questionnaire post-module completion. Pre-module, 49 out of 50 participants provided valid responses from which a summary score on the internally-produced pilot instrument was obtained; and 46 out of 50 participants provided valid responses from which a summary score on the *Attitudes towards Interprofessional Education* instrument was obtained. Post-module, 47 out of 49 participants provided valid responses from which a summary score on the internally-produced pilot instrument was obtained; and 44 out of 49 participants provided valid responses from which a summary score on the *Attitudes towards Interprofessional Education* instrument was obtained.

The low response rate was disappointing, and occurred despite timed announcements asking for participants via the University Virtual Learning Environment. The reasons for a low response rate could be related to a number of factors notwithstanding other priorities in the students' third year of study, such as theoretical and ~~clinical~~ practice placement assessments.

The full cohort (who completed the pre-module questionnaire) had an average age of 27.2 years (SD 6.98 years), and comprised 44 female and 5 male participants, plus one participant

whose gender was not recorded. Twenty-one participants had worked in healthcare before starting their university course; the average time spent working was 5.96 years (SD 5.52 years). Half the sample (25 students) were completing a degree in nursing. The remainder of the sample comprised 4 student midwives, 3 occupational therapy students, 6 operating department practice students, 5 physiotherapy students and 7 podiatry students. With many participants present in both cohorts, the demographic characteristics of the post-module cohort differed only slightly from those of the pre-module cohort. The average age in the post-module cohort was 28.7 years (SD 9.88 years), which comprised 44 female and 4 male participants. Twenty-two participants had worked in healthcare before starting their university course; the average time spent working was 3.92 years (SD 3.93 years). About half the sample (26 students) were completing a degree in nursing. The remainder of the sample comprised 4 student midwives, 8 operating department practice students, 5 physiotherapy students and 4 podiatry students. The high average age in both cohorts reflected the high number of mature students registered on the included courses.

Scores on the individual items, the internally-produced pilot instrument, and the *Attitudes towards Interprofessional Education* instrument are summarised for the pre- and post-module group in Table 1.

#### **Insert Table 2:**

Hence the responses to the single item measures were generally favourable. The mean scores on the internally-produced pilot instrument represented above-average levels of perception of effectiveness, with the mean perception of teaching and learning strategies increasing by 1.7 points following the workshop attendance. A 95% confidence interval for the change was given by (-3.42, 6.94). An independent samples t-test revealed no evidence for a difference at the 5% significance level ( $p=0.501$ ) on this measure.

Scores on the *Attitudes towards Interprofessional Education* scale also generally represented positive opinions, with mean scores increased by 0.818 points following the workshop attendance. A 95% confidence interval for the change was given by (-2.98, 4.61). An independent samples t-test revealed no evidence for a difference at the 5% significance level ( $p=0.669$ ) on this measure.

The median scores on 3 of the 4 single-item measures did not change post module, with the median score on 1 item changing by 2 points on the scale. Mann-Whitney U tests revealed no evidence for differences between pre- and post-module scores on any of these items at the 5% significance level ( $Z=0.863$ ,  $p=0.388$  for Item 1;  $Z=0.874$ ,  $p=0.382$  for Item 2;  $Z=1.22$ ,  $p=0.223$  for Item 3;  $Z=1.68$ ,  $p=0.092$  for Item 4).

## *Qualitative findings*

The free text responses were analysed using thematic analysis. Table 2 shows the six overarching themes and examples of representative quotes for pre and post module attendance. Each theme is considered briefly below.

### **Insert Table 3**

#### *Summary of qualitative findings*

##### *i. Promotes teamwork in the classroom*

Prior to completing the module, students felt that project working with their peers in interprofessional groups enhanced their communication and team-working skills. These ideas were embedded and refined further upon completion of the module, with students noting that their leadership skills and confidence had developed. Whilst students noted their team working had improved in the classroom, they felt that this experience did not reflect the multidisciplinary team and the clinical environment.

##### *ii. Developing awareness of other health care professionals' roles*

Despite the feeling that the classroom did not reflect the clinical environment, there were some comments which suggested students felt that IPE working in a research context did help them develop understanding of different health care professional roles. These comments were made both prior to, and upon completion of the module. The awareness of each other's roles along with their improved team working was noted to enhance patient care.

##### *iii. Polarising research and practice*

It was evident that research was not viewed as a topic that reflected real world interprofessional working. The pervasive view was that whilst research was important to understand, it was not integral to everyday clinical practice. It was not something routinely discussed between practitioners from different professions. Students felt research was an academic topic and the polar opposite of their professional roles to care for patients. There was a perception that IPL for research was less meaningful than experiences surrounding patient care.

##### *iv. MDT working or not working*

There was an apparent divide within accounts; suggesting the IPL teaching had both positive and negative implications for MDT working preparation. Some views suggested the blend of professional groups did not reflect real-world alliances. Whilst there were some natural partnerships within the teaching groups; for example, physiotherapists and occupational therapists, some pairings were less representative of practice; such as, for example, podiatry, and child or mental health nursing. Despite this, there was a theme of recognition that, whether

positive or negative, the sessions provided meaningful experience of working in multiprofessional groups.

v. *Logistical issues*

Participants placed significant emphasis on logistical problems impeding them from full engagement with the process. Timetable clashes and lack of opportunity to meet appeared to lead to frustration. Whilst this is not directly related to the content of IPE sessions it appears many responses were influenced by this negative experience. However, it was interesting to note that some respondents recognised this as reflective of practice. Students therefore felt this experience would help them to prepare for logistical barriers in the workplace.

vi. *Developing research skills*

There was a general feeling that whilst some research skills had been developed, these could have been developed just as easily in a professional environment. It would seem that upon completion of the module the students had greater insight into the complexities of the research process and consequently an enhanced awareness of their own developmental needs academically. Conversely, after completing the module, students expressed a definite lack in confidence applying research skills in a clinical setting.

## **Discussion**

The views of workshop participants towards inter-professional learning appear to be generally positive from statistical findings, as measured by all single-item measures and the two composite scales. Although there was no evidence for a statistically significant improvement from pre- to post-3<sup>rd</sup> year experience of the IPE/research approach, this is possibly not unexpected given the low sample size and high baseline scores, which limit the potential for scores to increase following workshop attendance. Conducting the analysis as a paired study, as originally intended, might be expected to show higher levels of significance; however, the levels obtained from the unpaired analysis are such that inferences would be very unlikely to change if a paired analysis had been conducted.

The questionnaire was administered to students immediately before and immediately after completion of their 3<sup>rd</sup> year study; hence minimising the potential for loss of internal validity through students acquiring knowledge or having their opinion affect by other agencies.

The analysis was able to utilise data from a wide diversity of students, with 6 professions represented. Nursing students, however, made up about half of the sample; consequently, some of the allied health professions were represented only in very small numbers. The gender balance (nearly 90% female) and levels of pre-university experience (a sizeable minority having previous healthcare experience) within the sample broadly reflected the underlying population of nursing and allied health students as a whole.

Conversely, the qualitative findings are more critical yet also contribute to ongoing discourse in the field. Lees and Meyer (2011) reported task-focussed IPE activities yield greater appreciation from participants; according to participants, this was a key weakness of the IPE research modules explored here. Whilst students were faced with shared tasks, the tasks were not directly relatable to clinical activities. This may account for some disenfranchisement evident in qualitative themes where research and practice appeared as polar opposites. Communities of Practice, theorised by Wenger (1998) are often linked to IPE pedagogical research (Lees & Meyer, 2011), and suggest the alignment of perspectives from multiple sources is essential when working towards a common purpose. Some tension, evident in the data, between research and practice may be explained by a lack of alignment. For students in these workshops, research was not a significant common purpose because it did not reflect the professional landscape they aimed to enter and was not pertinent to patient care or an authentic task related to their professional sphere. Students' willingness to engage with others and work around inter-professional barriers may have been reduced as a result. Other researchers also reported students did not always find professional relevance in generic patient case material (Van Diggele et al., 2021). The IPE intervention in the current study, however, was research focused and as such could be seen as fundamental to practice. Qualitative data analyses revealed that this was not the view shared by students, despite the high satisfaction scores reported in the corresponding quantitative analysis.

Large numbers of students studying across a variety of programmes created the potential for logistical problems, and data reveal these problems may have inhibited engagement and learning. Lees and Meyer (2011) likewise reported that learning suffered with lack of organisational support. The logistical issues encountered by students in this study were fed into the institutions' quality control processes and changes made as a result. However, unlike the experience of the students reported by Van Diggele, et al (2021), students in the current study were all working towards the same level of academic credit from the exercises. There should, therefore, have been equal impetus for contribution of effort to group tasks. However, data revealed that timetable congestion or clashes with clinical priorities meant some groups did not feel they had equal opportunity to engage.

This report is the only published evidence of combining a research theme with an interprofessional education theme. This research thus provides new insights for educators and researchers in this area.

### *Strengths and limitations*

The main strengths of the study included the wide array of student participants from different health care professions. The qualitative evidence also gave some interesting and insightful evidence considering how students perceived the combined educational theme of IPE and research.

Limitations included low participant numbers, thus restricting the power to detect time dependent changes in perceptions. A lack of pairing participants diluted any effect detecting any changes pre and post data collection and significant statistical findings.

### *Implications for practice*

This study confirms that research combined with IPE delivery, unless focused on and within clinical practice, is not perceived as bridging the theory to practice gap. Student participants valued some of the research content in facilitating their understanding and skills of different research methodologies. IPE purely combined with research is not a good fit. Further studies considering how these two important educational aspects interact with a focus on a shared topic which is valued and directly transferable to clinical practice is needed.

### **Conclusions**

Elements of the findings reflects that the IPE research modules fell short of the accepted definition of inter-professional learning when professions learn alongside, learn from each other including the clinical role to improve collaboration and the quality of care (CAIPE, 2002). The lack of clinical authenticity and distance from practice focus identified by the participants in the qualitative findings indicated that they may not have learned about each other to the extent desired. This raised questions about the appropriateness of “unnatural” pairings for undertaking research projects. Whilst the students worked together to learn about research and the research process, they do not appear to have perceived a universal benefit to their inter-professional clinical practice toward understanding and applying evidence-based practice.

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