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ARTICLES

Praxis and reflexivity for interprofessional education: towards an inclusive theoretical framework for learning

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Abstract

While there is growing evidence of theoretical perspectives adopted in interprofessional education, learning theories tend to foreground the individual, focusing on psycho-social aspects of individual differences and professional identity to the detriment of considering social-structural factors at work in social practices. Conversely socially situated practice is criticised for being context-specific, making it difficult to draw generalisable conclusions for improving interprofessional education. This article builds on a theoretical framework derived from earlier research, drawing on the dynamics of Dewey's experiential learning theory and Archer's critical realist social theory, to make a case for a meta-theoretical framework enabling social-constructivist and situated learning theories to be interlinked and integrated through praxis and reflexivity. Our current analysis is grounded in an interprofessional curriculum initiative mediated by a virtual community peopled by health and social care users. Student perceptions, captured through quantitative and qualitative data, suggest three major disruptive themes, creating opportunities for congruence and disjuncture and generating a model of zones of interlinked praxis associated with professional differences and identity, pedagogic strategies and technology-mediated approaches. This model contributes to a framework for understanding the complexity of interprofessional learning and offers bridges between individual and structural factors for engaging with the enablements and constraints at work in communities of practice and networks for interprofessional education.

Keywords

Case study, interprofessional education, interprofessional learning, praxis, qualitative method, reflexivity, theoretical framework

History

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Introduction

From a practitioner's viewpoint, criteria for a good theory include utility, effectiveness and alignment with their perceived goals (Eraut, 2003). The value of distinguishing professional practice from discipline is highlighted in the argument that professions derive their rationale from their ''social purpose and not from any distinctive form of knowledge'' (Eraut, 2003, p. 62). Professional practitioners contend with complex problems which lend themselves to theories drawn from a range of disciplines. The development of a model for interprofessional education (IPE), which values, adopts and successfully positions key learning theories within an inclusive framework, may be judged by its ability to make sense of the complexity of factors at work within professional practice.

This article proposes a meta-theoretical framework enabling social-constructivist and situated learning theories (Dewey, 1933; Lave & Wenger, 1991; Vygotsky, 1978; Wenger, 1998) to be interlinked and integrated through focusing on praxis and reflexivity in IPE. This article builds on a theoretical framework derived from earlier research (Hutchings, 2008a,b), drawing on Dewey's (1933) experiential learning theory and Archer's (2000, 2007) critical realist social theory to make a case for a theoretical model for interprofessional learning focusing on the dynamic relationships between the enablements and constraints at work in IPE. We will demonstrate how a theoretical model of zones of interlinked praxis can bridge the gap between individual/micro-level and social structural/macro-level orders of practice to contribute to more effective student engagement for transformative learning grounded in understanding the processes of stasis and change at work in different communities of practice and networks for IPE. Our purpose is to draw on theoretical perspectives to provide deeper insight into our findings and the zones of interlinked praxis provides a particular way of conceptualising and framing our ideas.

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Background

Theoretical perspectives

IPE literature has been criticised for offering largely descriptive and atheoretical perspectives (e.g. Barr, Koppel, Reeves, Hammick, & Freeth, 2005; Clark, 2006; D'Eon, 2005). An early systematic review by Cooper, Carlisle, Gibbs, & Watkins (2001) revealed little or no evidence of IPE approaches being linked to theoretical perspectives and, ten years on, the issue continues with Reeves et al.'s (2011) scoping review, identifying very little evidence of social science theory being deployed in the development and evaluation of IPE interventions. However, there is growing evidence of more theoretical perspectives presented as models and frameworks for informing practice and critical reviews of theories that have contributed to our understanding of IPE including D'Amour & Oandasan (2005), D'Eon (2005),

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Clark (2006), Craddock, O'Halloran, Borthwick, & McPherson (2006), Hean, Craddock, & O'Halloran (2009) and the special theoretical issue of the Journal of Interprofessional Care, edited by Reeves & Hean (2013). Craddock et al. (2006) identified that while most studies examined are linked to adult learning and reflective practitioner theories these are insufficient to underpin IPE, concentrating as they do on the individual learner's experience to the exclusion of theories informing the impacts of professional groups. IPE, by definition, is constituted by occasions ''when two or more professions learn with, from and about each other to improve collaboration and the quality of care'' (Barr et al., 2005, p. 31), emphasising the need to embrace theories associated with group development and teamwork for understanding IPE. Informed by perspectives from social psychology and focusing on group dynamics and intragroup collaboration, these theories encompass contact theory (Allport, 1979), professional stereotyping (Carpenter, Barnes, Dickinson, & Wooff, 2006), social identity theory (Hean & Dickinson, 2005; Tajfel & Turner, 2001) and sociological perspectives (Kitto, Thistlethwaite, Chesters, & Reeves, 2011).

Hean et al. (2009), in an overview of the IPE literature making explicit use of learning theories, distinguished between theories associated with the micro-level of learning, where the unit of analysis was the individual/student or practitioner, with the macro-level of learning where the unit of analysis was the structural/community, system or organisation. The relative values of these different perspectives were noted and the likelihood of theory selection by educators or evaluators according to the focus of their interests, intended goals and appropriateness to their context (Hean et al., 2009). For example, D'Eon (2005) presents three key elements for successful interprofessional learning at the micro-level of teaching practice, (1) that students be challenged by cases which are relevant and become progressively more complex; (2) that they work in cooperative groups and (3) that they engage in an experiential learning process, encompassing planning, doing, observing and reflecting. D'Eon (2005, p. 56) identifies the use of clinical cases (paper cases), service learning opportunities (cases with simulated patients) and learning in practice (cases of real people in real distress) as specific but differently constituted instances offering increasingly complex situations along a 'reality' continuum of experiential learning. D'Amour & Oandasan (2005), by contrast, propose a broader framework for integrating IPE with interprofessional practice through the concept of interprofessionality. They compare the education system with professional practice and identify interactional links at the micro-level between learners, teachers and professionals, institutional/organisational links at the meso-level between academic institutions and health organisations, and structural links at the macro-level through political, socio-economic and cultural systems. This framework is valuable in acknowledging the complexity of factors at work in IP education and collaborative practice, distinguishing spheres of activity in terms of recipient outcomes geared to evaluation for different stakeholders, educational initiatives to enhance learner outcomes and collaborative practice to enhance patient or service user outcomes. While these papers highlight a wide range of factors contributing to IPE, they do not offer a theoretical framework which can make connections between different learning theories to provide the means for dynamically integrating individual and structural enablements and constraints at work in IPE towards understanding and improving learner and client outcomes.

Similarly learning theories whether associated with behaviourism or constructivism (Jarvis, Holford, & Griffin 2003), tend to foreground the individual, focusing on the psycho-social aspects of individual differences and professional identity to the detriment of situated social practices. Conversely socially situated practice, associated with the work of Lave & Wenger (1991) on situated learning and communities of practice (Wenger, 1998) can be criticised for being context-specific, making it difficult to draw generalisable conclusions for improving IPE. Clark's (2006) analysis of theoretical perspectives, useful for informing IPE interventions operating at the micro-level, comes nearest to providing a toolkit of pedagogic theories for inclusion within the theoretical framework proposed in this article. Clark (2006) highlighted the significance of professional groups and identities by identifying the epistemological and ontological stances informing the social construction of professions and providing cognitive and normative maps for steering and guiding professional identities and actions. The centrality of collaborative learning and the idea of learning as social and situated are keys here. Clark argued for the value of social exchange in causing 'decentring' as the trigger for transformative learning in interprofessional groups (Clark, 2006, p. 580). Decentring has resonance with Dewey's theory of learning through experience which identifies a degree of discomfort and challenge necessary as a lever for change in the individual. He argues that learning is triggered by ''a state of doubt, hesitation, perplexity in which thinking originates'' as the catalyst for change, leading to ''an act of searching, hunting, inquiring to find material that will resolve the doubt, settle and dispose of the perplexity'' (Dewey, 1933, p. 12). This theory of experiential learning is associated with the concept of ''disjuncture'' when there is ''disharmony'' or a lack of congruence between the individual's ''constructed experience of a situation'' and their ''biography'', which can make them unsure as to how to act (Jarvis, 1999, p. 66). Disjuncture then is an essential ingredient in experiential learning which is a focused process directed to solving a question or issue through purposeful thinking or reflection (Dewey, 1933). The utility of generating disruptions - tensions and challenges – to stimulate learning is at the heart of Dewey's experiential learning theory. Opportunities for transformative learning are precipitated by the potential of triggers to lead to congruence or disjuncture in the individual depending on their correspondence with previous experiences. Clark notes the importance of experiential learning and social interaction as a basis for organising processes of student engagement with problem-based learning using cases as triggers, in keeping with Eon's (2005) contribution. The value of group processes and interactions with others, the *social* in learning, is identified in Vygotsky's (1978) social constructivist learning theory where the zone of proximal development describes the distance between the individual's actual and potential developmental level and where the role of significant others, whether represented by tutors or more capable peers, are the means of bridging this distance. This social constructivist learning theory is closely linked with Lave & Wenger's (1991) notion of situated learning and legitimate peripheral participation in which learners may be situated at the periphery of a community of practice as they enter professional education and develop their interprofessional learning, mediated by significant others to achieve transformative learning. It is the dynamics of these relationships between zones of proximal development and positioning at different points in communities of practice that we will consider as a model of zones of interlinked praxis within this article.

Methods

We selected a mixed methods case study approach (Yin, 2009) to enable the research team to capture a wide range of student experiences using qualitative and quantitative methods. Data were collected over a 2-year period from 2006 to 2007 through online surveys, questionnaires and focus groups.

The implementation and impacts of the Wessex Bay virtual community research project, funded by the Higher Education

Academy, have been reported elsewhere (Pulman, Scammell, & Martin, 2008; Quinney, Hutchings, & Scammell, 2008). Building on earlier research which generated a theoretical framework for understanding and enhancing learning in higher education (Hutchings, 2008a,b), our purpose here is to make a case for a theoretical model for interprofessional learning enabling social-constructivist and situated learning theories to be interlinked and integrated through praxis and reflexivity towards understanding and improving learner and ultimately client outcomes from IPE. We will use data concerning student experiences of IPE followed over a 2-year period to illustrate the applicability of the model and show how it has informed the development of the theoretical model proposed.

Context

Based in the UK, Bournemouth University introduced an interprofessional curriculum for nine undergraduate programmes leading to professional qualifications in nursing branches (adult, child, mental health and learning disability), midwifery, occupational therapy, operating department practice (ODP), physiotherapy and social work. The undergraduate programmes do not include medical students and this will be discussed below as a possible limitation. While these uni-professional groups were the primary source of identity for students, pedagogic strategies were developed to promote student enquiry through problem-based learning, using case scenarios, and collaborative learning opportunities through group work with students drawn from different professions. A blended learning strategy combining face-to-face with online learning activities was adopted using a simulated community, Wessex Bay, and the University's virtual learning environment (VLE). Wessex Bay was peopled by health and social care users and providers living and working in a typical seaside community. The cases provided realistic scenarios developed by health and social care practitioners and service users with static and evolving scenarios as triggers for problem-based learning activities relating to the residents. The aim was to provide authentic and challenging learning activities through case conferences and role plays situated in realistic learning environments.

Data collection

All undergraduate students, in the nine programmes undertaking IPE for the first time in January 2006, were targeted to participate in this research ($n = 600$). The demographic profile derived from the baseline surveys, conducted in Year 1 and Year 2 is presented in Table I. The majority of students in the survey sample for both years were female. Students between the ages of 18 and 21 years were most frequently represented though approximately 50% were over 26 years. Nursing students were most frequently represented in the survey sample, followed by midwives. The plan was to gather student data using the same methods in each year. In Year 1, it was not possible to schedule focus groups (FG) with adult, child health and mental health nursing, due to programme timetable difficulties. In Year 2, it was not possible to conduct the end of unit e-survey (ES) as the university changed its system of student unit evaluation. These groups were targeted with a questionnaire (1SQ in Year 1 and 2SQ in Year 2) using the interview guide questions deployed in the focus groups.

Data analysis

The focus of our analysis for this article is on student perspectives of what worked and what did not, drawing on the qualitative data for both years. For Year 1, this consisted of the data collection methods and professional groups specified in Table I; the end of unit e-surveys (ES3, ES4), focus groups (FG 1–6) conducted with six, and questionnaires (1SQ) with two, of the uni-professional groups; for Year 2 this consisted of questionnaires (2SQ) with responses returned from each of the professional groups.

Table I. Demographic profile of IPE students and data collection methods deployed.

	Year 1 (2006)	Year 2 (2007)
Student participants by	% of total sample ES1 $n = 252$	% of total sample ES2 $n = 143$
Gender		
Female	92.0	95.0
Male	8.0	5.0
Age range		
18–21	32.0	35.0
22–25	11.0	15.0
26–35	30.0	26.0
36–45	21.0	18.0
46–55	5.0	6.0
Professional group		
Nursing	61.0	57.0
Midwifery	16.0	16.0
Occupational therapy	7.0	5.0
ODP	5.0	3.0
Physiotherapy	8.0	14.0
Social work	3.0	5.0
Data collection method		
Baseline e-survey (ES)	ES1 $n = 252$	ES2 $n = 143$
End of unit e-survey (ES)		
• Communications	ES3 $n = 187$	X
• Preparation for Professional Practice	ES4 $n = 258$	X
Focus group (FG)	$n = 6$–10	Questionnaire (2SQ) $n = 37$
• Learning disability nursing	FG6	2SQ3 $n = 4$
• Midwifery	FG1	2SQ5 $n = 5$
• Occupational therapy	FG4	2SQ7 $n = 7$
• ODP	FG2	2SQ6 $n = 1$
• Physiotherapy	FG3	2SQ8 $n = 3$
• Social work	FG5	2SQ9 $n = 2$
Questionnaire (1SQ)		
• Adult nursing	1SQ1 $n = 14$	2SQ1 $n = 16$
• Child health nursing	x	2SQ2 $n = 1$
• Mental health nursing	1SQ2 $n = 11$	2SQ4 $n = 3$

The qualitative data were subjected to thematic analysis and review by the research team, using the constant comparative method to identify patterns in the data (Glaser & Strauss, 1967; Holloway & Wheeler, 2002; Miles & Huberman, 1994). The content was coded and grouped into larger categories to form three major themes: pedagogic strategies, technology-mediated approaches and professional differences and identity. The model derived is rigorous based on a systematic approach to qualitative data analysis and application of theoretical frameworks used to guide the work undertaken.

Ethical considerations

Ethical processes and procedures were followed ensuring informed consent and data confidentiality in compliance with institutional protocols for undertaking research with students and staff. Survey and questionnaire completion was voluntary and anonymous. Student focus groups were recruited by professional programme on completion of the unit and conducted by researchers who were not involved in unit delivery. Formal consent was obtained prior to data collection and focus groups transcripts were anonymised.

Findings and discussion

The findings will be considered under each of the three themes: pedagogic strategies associated with learning activities and group

interaction; technology affordances, technology-mediated approaches through case scenarios and using the VLE for group work and collaborative learning; and professional differences and identity identified through working with different professions.

Table II maps the interplay between these three major themes, pedagogic strategies (P), technology affordances (T) and professional differences and identity (Id) as essentially disruptive interventions, aligning them with the constituents for transformative learning (1–5) listed in the first column of the table. The constituents for learning: grounded in real world relevance; loosely defined problems requiring students to think constructively and creatively; enabling opportunities for group work and collaboration; encouraging connection with and appreciation of different perspectives through relationships and encounters with others; and providing opportunities for reflection, application and development; represent key principles for guiding problem-based cases and collaborative learning strategies (Boud & Feletti 1997; Clark, 2006; D'Eon, 2005; Hutchings, Quinney, & Scammell, 2010). The major themes identified and their related constituents for learning are cross-matched with rows A and B of the table where student perceptions, of factors in the learning experience create opportunities for congruence (A) and disjuncture (B) expressed through illustrative comments from student participants in Years 1 and 2 of the programme. We will demonstrate how the data analysis has contributed to an emerging theoretical model for IPE, making reference to these illustrative comments using the notation key theme (P, T or Id), constituents for learning (1–5), towards congruence or disjuncture (A or B), for example (P1A). This model will identify the different and multiple manifestations of congruence and disjuncture at work in the different zones of practice of that students experience and how these processes contribute to maintaining stasis or stimulating change.

Pedagogic strategies

Curriculum challenges for IPE included changing pedagogical strategies, moving beyond shared teaching to collaborative learning. Shared teaching could have encompassed large mixed professional groups brought together in a lecture theatre to be taught, for example, ethical principles. But our aim was to foster more active, collaborative learning through constructing interprofessional groups to work together on case scenarios and issues, bringing the students' developing professional practice to bear in the generation of care management outcomes. This approach links to the first part of our theoretical framework provided by Dewey's (1933) concept of experiential learning as a focused process, directed to solving a question or issue through purposeful thinking or reflection. Students identified learning benefits of the case scenarios for facilitating the integration between practice and theory through the creation of characters that had real world relevance which is in keeping with D'Eon's (2005) description of different kinds of cases. This finding is illustrated in the student comment: ''*It is easier to relate theory to practice when characters are created. They help to bring problems and health issues to life*'' (P1A). But for other students, the case scenarios lacked depth being described as ''*very one dimensional*'' (P1B). Students who successfully managed the challenge of working creatively to construct and negotiate shared interpretations of these loosely defined cases did so by ''*reading between the lines for not so obvious information*'' (P2A) while others reported the cases were too loosely defined, that ''*four-five lines*'' (P2B) was insufficient information to work with. The mixed profession peer group provided an important focus for stimulating interprofessional learning with students identifying the benefits of working interactively in small groups, described as ''*very interactive*'' and ''*just the right size*'' (P3A) to allow students to learn with and from each other (Barr et al., 2005). Others anticipated the learning environment would be more ''*interactive*'' and expected the cases to change and develop (P3B). The zone of proximal development (Vygotsky, 1978) appeared more challenging to negotiate for some students, whose expectations were that more information should have been provided for them.

Some students clearly demonstrated openness to making connections between their own experiences and those of others through working systematically through the problems set as exemplified in the comment: ''*We tried to go through what the various problems were*'' from each professions' ''*own perspective*'' (P4A). This learning process involves making connections through a flow, or deliberation, between thinking and action. Dewey (1933) described this as an 'internal conversation' central to learning and reflective practice and distinguished from everyday thinking because: ''Reflection involves not simply a sequence of ideas, but a *con*-sequence'' (pp. 4–5). Yet other students struggled to see the value of working with other professions and trying to interpret cases ''*from every professional's point of view*'' (P4B). Students, who focused on what the learning environment provided rather than what they needed to do to learn, appeared to be at a different more peripheral position in their conceptions of learning experienced as in a trajectory between surface and deep approaches to learning (Marton & Säljö, 1997). The pedagogic strategies adopted favoured problem-based learning over transmission of knowledge and in so doing may have contributed to the variable degrees of congruence and disjuncture experienced by students. Some students were able to observe and reflect on how group work helped them improve their understanding exemplified in the student comment: ''*Observed how groups have interacted with more theoretical knowledge therefore improving my own understanding*'' (P5A). Others needed more support, at least initially, to engage with different approaches to learning reflected in the comment: ''*It was really stressful that first week not knowing and being in control of things. When you did get into it I thought it was really good*'' (P5B).

Technology affordances

A further curriculum challenge was to provide parity of learning experience for large numbers of students unevenly spread between professions and across a wide geographical area with students located in academic centres nearby. This was achieved through developing shared pedagogic strategies mediated through technology affordances which included Wessex Bay and other online learning resources accessed through the VLE. Students identified benefits of the case study characters in providing experiences relating to ''*real life situations*'' (T1A) but some considered the Wessex Bay community had ''*too many characters*'' making it ''*over complicated*'' (T1B) for considering each character's family and community relationships.

Students appreciated the value of the VLE for keeping all course related information ''*together in one place*'' (T2A) but others found it to be ''*incredibly frustrating*'' (T2B) for finding items. The value of technology mediated approaches in overcoming place-situated and time-bounded classrooms has been reported elsewhere (Hutchings et al., 2010). Students recognised the convenience of being able to ''*access it from home*'' (T2A) but others without home internet access ''*were unable to join in the discussion making them feel left out*'' (T2B). Some students valued the online collaborative learning, saying, for example: ''I *enjoyed working on the online discussion*'' (T3A) but others suggested ''*the online discussion lacked direction*'' (T3B).

As with the experience of engaging with different pedagogic strategies, students demonstrated different stages in their development of familiarity and capability with using technology,

Table II. Congruence and disjuncture in action: mapping student perceptions of learning in an IPE intervention.

Constituents for learning	Student perceptions of congruence	Student perceptions of disjuncture
Pedagogic strategies (P)	**A**	**B**
1. Grounding in real world relevance	*It is easier to relate theory to practice when characters are created. They help bring problems and health issues to life* (2SQ1 – Adult nursing)	*Very one dimensional, nothing develops over time* (2SQ5 – Midwifery)
2. Loosely defined problems	*To read between the lines and look for not so obvious information* (2SQ1 – Adult nursing)	*To use a case study that was four-five lines as the basis for an essay question was ridiculous – we needed much more information on the character* (2SQ3 – Learning disability nursing)
3. Group work and collaboration	*I liked the way this unit is very interactive rather than in lecture format. The groups were of just the right size to allow this to happen* (ES3)	*Any learning environment should be interactive. There was no interaction or development* (2SQ5 – Midwifery)
4. Appreciating and connecting with different perspectives	*We tried to go through what the various problems were…if that person lived on their own, was disabled. We each tried to pick up on something for particular professions. I had an occupational therapist, a physiotherapist, a couple of nurses, so they all tried to put their own input into what that patient would need from their own perspective* (FG2 - ODP)	*It was hard when it came to doing our group work because we had to see it from every professional's point of view, I mean you had nurses and an OT and physio* (FG3 – Physiotherapy)
5. Opportunities for reflection, application & development	*Observed how groups have interacted with more theoretical knowledge therefore improving my own understanding and my contribution within groups* (2SQ1 – Adult nursing)	*It was really stressful that first week not knowing and being in control of things. Not being prepared. When you did get into it I thought it was really good* (FG1 – Midwifery)
Technology affordances (T)	**A**	**B**
1. Grounding in real world relevance	*Characters to relate to, real life situations* (2SQ4 – Mental health nursing)	*It's too big, over complicated, too many characters* (2SQ1 – Adult nursing)
2. Loosely defined problems	*I could access it from home, it was more convenient* (2SQ1 – Adult nurse) *It keeps everything together in one place, information, presentations, announcements, timetables; it's a fantastic programme* (FG4 – Occupational therapy)	*Many did not have PCs at home so were unable to join in discussion making them feel left out* (ES3) *Incredibly frustrating, you can never find the same thing twice* (2SQ5 – Midwifery)
3. Group work and collaboration	*I enjoyed working on the online discussion* (ES4)	*The online discussion lacked direction and many people were unsure where the discussion was to take place* (ES3)
4. Appreciating and connecting with different perspectives	*We could have done group work online but it wasn't an option for people I was working with because they weren't interested in it or didn't know how to use it* (FG3 - Physiotherapy)	*I think it was foreign to everyone at the beginning because it has only been in this year and even the tutors were struggling* (FG2 – ODP)
5. Opportunities for reflection, application & development	*I have become more computer literate and can use the online resources more effectively* (2SQ9 – Social work)	*Many groups did not feel comfortable with using IT and this has increased stress levels* (ES3)
Professional identity (Id)	**A**	**B**
1. Grounding in real world relevance	*Working with students from other disciplines is a valuable experience* (ES3)	*It is the same as it has always been. You end up having to fight your cause and prove that OTs are valuable* (2SQ7 – Occupational therapy)
2. Loosely defined problems	*I am more aware of the complex situations of many patients and which professionals I can involve* (2SQ8 – Physiotherapy)	*Respecting differences whilst also challenging those differences in a positive manner* (2SQ4 – Mental health nursing)
3. Group work and collaboration	*I liked working in smaller groups with other health professionals. It enlightened us all on what each other's roles are within the health profession* (ES3)	*The unit has proved challenging, to have to work closely with students from other professions who don't appear to have the commitment or drive we midwifery students seem to have* (ES3)
4. Appreciating and connecting with different perspectives	*I feel that it has given me an appreciation of nursing students. Helps to breakdown tribalism between professional groups* (2SQ5 – Midwifery)	*Nurses not wanting to cooperate with others in the group and do their share of the work on time! Nurses who think that others in groups can do all the work and they have to do nothing towards a weekly project. It is very disappointing* (2SQ7 – Occupational therapy)
5. Opportunities for reflection, application & development	*It really helped me to understand how important it is to understand other people's roles in order to get the best outcome for both patients and staff* (2SQ1 – Adult nursing)	*I think it broke down some stereotypes. It broke down the prejudices and some of the preconceptions that you had* (FG5 – Social work)

particularly for online discussions. IT skill levels varied with some students demonstrating more familiarity and enthusiasm about working online; ''*We could have done the group work online but it wasn't an option for people I was working with because they weren't interested in it or didn't know how to use it*'' (T4A) and others feeling that ''*it was foreign*'' and that ''*even the tutors were struggling*'' (T4B). Differences in levels of digital literacy and access contributed to the congruence and disjuncture experienced, and suggested students were at different positions on trajectories of engagement with technology enhanced learning. Feelings of discomfort and stress were expressed by students in Year 1: ''*Many groups did not feel comfortable with using IT and this has increased stress levels*'' (T5B). In Year 2 students recognised they had developed their digital literacy, for example, ''*I have become more computer literate and can use the online resources more effectively*'' (T5A). This suggests some of the disjuncture experienced could be reduced over time as familiarity and capability was further developed.

Professional differences and identity

Creating opportunities for collaborative learning through working with different professions also highlighted areas of congruence and disjuncture in building professional identity and recognising and working with differences. This is where we might have anticipated the greatest degree of disjuncture by taking students out of their comfort zone of working uniprofessionally to work with other professional groups, creating the 'decentring' identified by Clark (2006) as a trigger for transformative learning. Students appeared to value the experience of working with other professions. For some students the group work ''*enlightened*'' them on ''*each other's roles*'' within the health profession (IdA3). Comments included ''*Working with students from other disciplines is a valuable experience*'' (Id1A) and ''*I am more aware of the complex situations of many patients and which professionals I can involve*'' (Id2A). However they also learnt about how to deal with disjuncture by ''*respecting differences whilst also challenging those differences in a positive manner*'' (Id2B) and speaking up for the contributions of their own professions (Id1B).

The argument that students need to develop their own sense of professional identity before being able to work effectively with other professions has some credence but our findings would suggest this is not the case for all students. One possible explanation could relate to transitions and development over the two years with statements attributed to Year 2 students (2SQ) but benefits of interprofessional learning were recognised in both years. Another explanation could relate to the large number of mature students (see Table I) able to draw on life experiences. Another factor was that this IP initiative was not happening in isolation. Students were able to draw on interprofessional encounters in their practice placements: ''*I feel that I have a better understanding of interprofessional work due to my placements*'' (2SQ1), and strengthen subsequent placements through their interprofessional learning: ''*The topics we discussed, like confidentiality and consent, you take that back into the work placement. I thought more about what I was saying in front of people*'' (FG5).

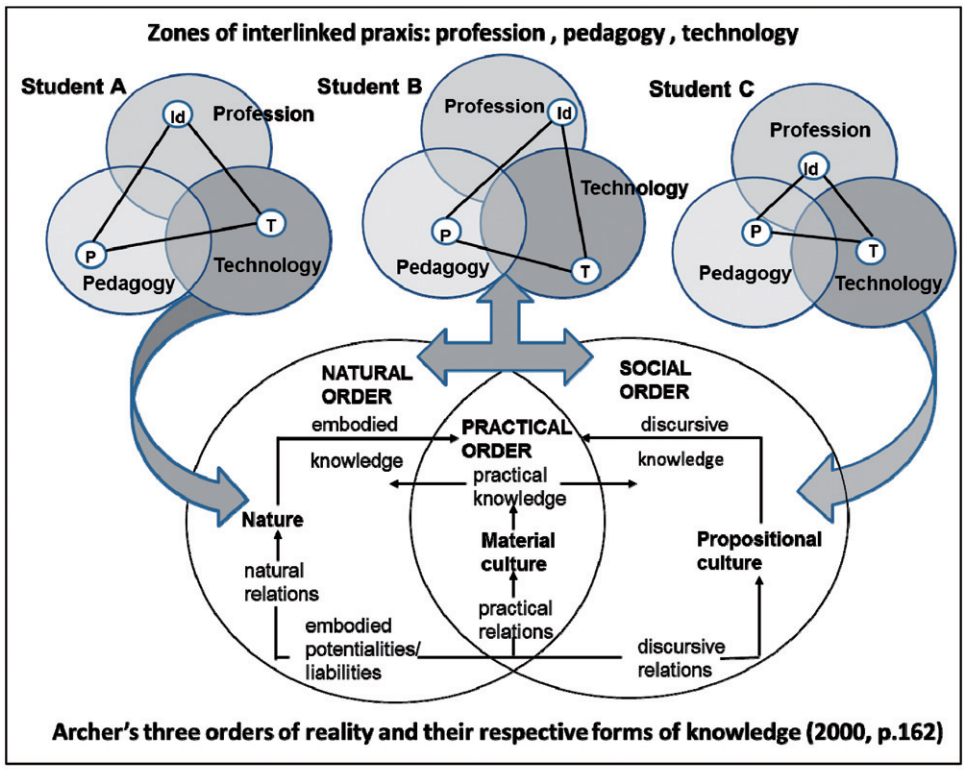
The opportunities created for reflection, application and development enabled students to recognise the disjuncture caused by prejudices and preconceptions and helped to break down stereotypes (Id5B) and ''*tribalism between professional groups*'' (IdA4). But for some students the experience of working in mixed professional groups appeared to reinforce boundaries and stereotyping when professional identity was used to explain differences in group behavior illustrated in comments such as: ''*To have to work with closely with students from other professions who don't appear to have the commitment or drive we midwifery students seem to have*'' (Id3B) and: ''*Nurses not wanting to cooperate with others in the group and do their share of the work on time!*'' (Id4B). Novice practitioners, building their knowledge and professional allegiances through legitimate peripheral participation in the community of practice of a specific profession (Lave & Wenger, 1991), could be focusing on their own profession-specific trajectory to the exclusion of appreciating the importance of working with and valuing the contributions of other professions. It may be a question of lack of maturity of students, who need to develop confidence in their own professional identity before being able to engage effectively with other professionals. But the student experiences described here would suggest IPE needs to be integrated throughout professional education to challenge and address dangers of stereotyping with the aim of enabling students to appreciate ''*other people's roles in order to get the best outcome for both patients and staff*'' (Id5A).

Towards a more inclusive theoretical framework

The utility of generating tensions and challenges to stimulate transformative learning is at the heart of Dewey's experiential learning theory and provides a valuable model for understanding specific micro-level levers required in the act of transformative learning. The IPE curriculum was characterised by learning opportunities created through provision of case scenarios and working together in interprofessional groups to inspire learning by creating triggers and spaces for disjuncture. Student perceptions of their interprofessional experiences reflect different constituents at work and different degrees of congruence and disjuncture. Our analysis has provided the focus for mapping individuals at different stages of their developmental trajectory within each of three zones of praxis towards a more centred position according to their experience and engagement with pedagogy, technology and profession with opportunities to move along trajectories of pedagogy to deeper approaches to learning, technology to increasing digital literacy, and professional identity to greater awareness of specific professional development in relation to valuing and working with difference.

This is represented in the upper part of Figure 1 where typical students, A, B and C, are positioned at different points within each of these zones of praxis according to their experience and potential trajectory with regard to professional affiliation and identity (Id), learning approaches (P) and digital literacy (T). The reality, following Lave & Wenger's (1991) concept of legitimate peripheral participation, is that individuals participating in new IPE initiatives, and experiencing different pedagogic strategies, and working with new technologies, are more likely to describe experiences that place them on the periphery of one or more of these zones of praxis in the early stages of development, and working towards a more centred position. But while Lave and Wenger's work on situated learning and legitimate peripheral participation in communities of practice informs the representation of these zones of praxis, we have termed them zones rather than communities of practice because different individuals are more likely to recognise and align themselves more closely or more loosely with these different zones of practice according to their experiences and biographical history.

Setting a challenge or problem for students can act as the motivating force to spark learning. But Dewey's theory is not sufficient to explain why the anticipated transformation in the student learning experience does not necessarily occur as planned. Though learning environments are purposefully designed to engage students in learning opportunities guided by theoretically grounded pedagogical principles as constituents for learning, there is no guarantee the students' experiences will align with the



Key
Id = Professional affiliation and identity positioned in zone of professional practice development
P = Learning approach positioned in zone of pedagogy
T = Digital literacy positioned in zone of technology affordances

Figure 1. Zones of situated and interlinked praxis.

intentions of the IPE intervention. What happens in the spaces for transformative learning is dependent on the way the different potential trajectories are influenced by knowledge, understanding and engagement with pedagogic strategies, technology affordances and professional differences and identity and how they interact with each other as micro- meso- and macro-level (D'Amour & Oandasan, 2005) enablements and constraints at work in the learning environment. It is here that an alternative practice theory can assist our understanding and engagement with the enablements and constraints at work in IPE. Archer (2000) identifies a model of three orders of reality: natural, practical and social, and their respective forms of knowledge: embodied, practical and discursive, which are constituted by and interlinked through practical action. A representation of Archer's model (2000, p. 162) of three orders of reality and their respective forms of knowledge is presented in the lower portion of Figure 1. While none of these orders has any automatic precedence in understanding the processes at work in interprofessional learning, our position, following Archer's work (2000, 2007), is to give primacy to the practical order. Practice is pivotal for understanding human activity and the interplay of structure and agency played out through social interaction and intersections between parts and people where individuals negotiate their pathways employing praxis and reflexivity hence the use of arrows to demonstrate the dynamic relationships for each student engaging in the natural, practical and social orders. Praxis, as defined by Carr & Kemmis (1986, p. 33), is ''informed action which, by reflection on its character and consequences, reflexively changes the 'knowledge-base' which informs it''. Hence it is possible to argue that reflection both on and in practice is embedded within praxis and that action and knowledge are being informed simultaneously. Practical judgements, emerging from praxis, are informed and committed actions and the practice of reflexivity is fundamental for understanding how different individuals will respond to learning opportunities. Archer defines reflexivity as ''the regular exercise of the mental ability, shared by all normal people, to consider themselves in relation to their (social) contexts and vice versa'' (2007, p. 4) and identifies it as ''the means by which we make our way through the world'' (2007, p. 5). Adoption of a position recognising reflexivity as part of people's everyday lives rather than an activity confined to academic scholars and researchers is a key premise here. Like Dewey's model, the activity of individuals, are not narrowly defined as practising a skill but rather as the development of knowledge through action and purposeful thinking within a social context which acknowledges the individual's prior learning experiences as embodied knowledge and the impact of the educational context of discursive knowledge. Practical judgements will be influenced by the natural order and embodied knowledge and by the social order and discursive knowledge (Archer, 2000, 2007). This is a theory that can offer bridges between individual/micro-level and social structural/macro-level factors by focusing on practice rather than concentrating on one or other perspective according to interests and goals.

The potential for the constituents for learning to create variable degrees of congruence and disjuncture among the students serve to highlight the paradox of relationships between enablements and constraints at work in the processes of interprofessional learning. Our findings identified patterns of congruence and disjuncture across the three themes of professional differences and identity, pedagogic strategies and technology affordances. Our analysis identified the importance of professional identity highlighted in differences in the perceived value and relevance of specific IPE cases for particular professions; differences in participants' perceptions and expectations of the affordances offered by the IPE learning resources to provide the pedagogical interactivity

required for effective learning; and related differences in the IT knowledge and skills capabilities of individuals. This has led us to propose a dynamic and developmental praxis focused approach, generating a model of zones of interlinked praxis, represented in Figure 1, for understanding the complexity of practice and informing research into IPE.

Educational interventions are necessarily and can be risky for learners and educators alike. The argument for loosely defined scenarios, providing limited resources to help students develop their powers of critical thinking is well made by Boud & Felletti (1997), mirroring the real world complexities of practice for which the students are preparing but leaves the educational practitioner open to challenges of what constitutes appropriate guidance to assuage criticisms of poor pedagogical design or insufficient scaffolding to support the learner's engagement in the learning environment. Students challenged by problem-based learning approaches or working collaboratively in groups may be categorised as having particular learning styles less conducive to approaches rather than leading to considerations of strategies to prepare and develop mastery of particular learning approaches. Students and staff challenged by new ways of working with technology mediated learning may criticise the structure, content and processes rather than looking to opportunities to develop knowledge and skills for mastering new approaches. This has led us to a broader interpretation of socially situated practice, avoiding the tendency to focus on either the individual or the social, and averting the tendency to seek narrow deficit solutions which fail to address the complexities and interconnected factors at work within IPE practice. This position offers a more inclusive theoretical framework for understanding the complexities of learning which can address the wholeness of human beings operating with their senses, emotions and cognitions, influenced by prior experiences, and situating learning in its social context where the interplay of agential and social factors can be demonstrated.

Limitations of this study include a marked variation in numbers participating in Year 1 compared with Year 2. In addition, the focus groups did not include all views and the child health nursing professional group did not respond. While the findings are not representative of all students, they provide insights into student experiences of an IPE initiative. The research design adopted does not attempt to establish a direct causal relationship between the students' experiences and the IPE initiative but rather to achieve generalisability of findings to theoretical propositions rather than populations (Yin, 2009). It opens possibilities for IPE practice to be examined and insights to be drawn from the unexpected as well as confirming or denying the anticipated. While individuals are making choices they can also be enabled or constrained by prior experiences and structural factors at work in the practice situation. The lack of medical students in this study could be perceived as a further limitation given the significance of their role in health and social care and it would be beneficial to be able to include them in future studies. However this limitation does not detract from the applicability of this framework for understanding the complex processes and development of interprofessional learning within and between different health and social care professions.

Concluding comments

This theoretical framework encompasses relationships between theory and practice and knowledge and skills which can be applied to a variety of complex socially situated practices. The theoretical perspectives drawn provide deeper insight into our findings and the theoretical model provides a particular way of conceptualising and framing our ideas. The key implications for practice and research in IPE are recognising that initiatives are as much about process and development, as content and outputs. Questions for further research will be how the model applies in other contexts such as work based learning and whether there are other zones of praxis that could be identified. The zones of differential and developing praxis provide a theoretically informed framework for understanding the complexity of boundaries and interactions, critiquing the tensions between IPE curriculum content and process, and appreciating the implications of technology affordances. It is hoped the development of this framework will contribute to more effective student engagement for transformative learning and grounded understanding of the enablements and constraints at work in IPE. It is through a more focused understanding and engagement with the complex interplay of communities of praxis and interconnected networks that we can improve the experiences of IPE.

Declaration of interest

The authors report no declarations of interest. The authors alone are responsible for the writing and content of this article.

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