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THEORIES IN MEDICAL EDUCATION

Theoretical insights into interprofessional education: AMEE Guide No. 62

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Abstract

In this Guide, we support the need for theory in the practice of interprofessional education and highlight a range of theories that can be applied to interprofessional education. We specifically discuss the application of theories that support the social dimensions of interprofessional learning and teaching, choosing by way of illustration the theory of social capital, adult learning theory and a sociological perspective of interprofessional education. We introduce some of the key ideas behind each theory and then apply these to a case study about the development and delivery of interprofessional education for pre-registration healthcare sciences students. We suggest a model that assists with the management of the numerous theories potentially available to the interprofessional educator. In this model, context is central and a range of dimensions are presented for the reader to decide which, when, why and how to use a theory. We also present some practical guidelines of how theories may be translated into tangible curriculum opportunities. Using social capital theory, we show how theory can be used to defend and present the benefits of learning in an interprofessional group. We also show how this theory can guide thinking as to how interprofessional learning networks can best be constructed to achieve these benefits. Using adult learning theories, we explore the rationale and importance of problem solving, facilitation and scaffolding in the design of interprofessional curricula. Finally, from a sociological perspective, using Bernstein's concepts of regions and terrains, we explore the concepts of socialisation as a means of understanding the resistance to interprofessional education sometimes experienced by curriculum developers. We advocate for new, parallel ways of viewing professional knowledge and the development of an interprofessional knowledge terrain that is understood and is contributed to by all practitioners and, importantly, is centred on the needs of the patient or client. Through practical application of theory, we anticipate that our readers will be able to reflect and inform their current habitual practices and develop new and innovative ways of perceiving and developing their interprofessional education practice.

About the Guide

Aims

The aims of this Guide are to:

- support the need for theory in the practice of interprofessional education;
- highlight that a range of theories that can be applied to interprofessional education;
- discuss specifically the application of theories that support the social dimensions of interprofessional learning and teaching;
- explore the practical application of these theories in an interprofessional education case scenario.

Purpose

In this Guide, we follow up some of the work started during an UK Economic and Social Research Council funded seminar series Evolving Theory in Interprofessional Education (Hean et al. 2009a).[1] Our experience as members of the convening group for the seminar series enabled us to further develop our understanding of the use and importance of theory, generally, and in particular for policy makers, curriculum developers, teachers and students involved in interprofessional education. We believe that theoretical models and concepts have a dual value for staff involved in interprofessional education: first by enabling the articulation and development of their teaching practices and second by providing ways for interprofessional facilitators to help students understand reasons for, and attributes of, collaborative and interprofessional practice.

Throughout the Guide, we discuss how theory can be used to articulate and further understand practice. This can be seen as the raison d'être of the Guide: to be of use to interprofessional education practitioners and thus of value to their students. Through the use of a case study about the development and delivery of interprofessional education for pre-registration healthcare sciences students, we show how theory translates into practice and enables the informed development of practice. This may imply, incorrectly, that the theory practice link is unidirectional. Our contention is that theory comes from practice, or at the very least, is informed by practice: ideas and understandings flow from one to the other

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Practice points

- Make full use of the range of theories available as tools to articulate and defend the best interprofessional educational practice: do not limit your reading to frameworks that are linked to interprofessional education as the only key word. *Team working*, *collaboration*, *continuous care*, etc. provide a pool of literature to draw on.
- Building social relationships between learners (and teaching staff) from different professional groups should be an explicit aim of an interprofessional education curriculum.
- The theories of social constructivism and social capital support the tenet that learning that takes place in interprofessional education cannot be achieved in professional or social isolation.
- Use theories to justify and guide learning and teaching methods from the outset of interprofessional education curriculum development and redevelopment, and for both practice-based and campus-based initiatives.
- Post-modern society increasingly demands that staff make the transition from independent work underpinned by their own professional knowledge to collaborative working based not only on their knowledge but also on the terrains of knowledge that emerge from interprofessional thinking.
- Knowing how professional knowledge is created and its traditional links with power and control can help staff and students to manage their reactions to interprofessional education and collaborative practice.

and what we are in fact doing here is rearticulating our practice. Put another way, theory does not originate and procreate in a vacuum; it comes from our observations of practice and is confirmed by our practice.

Introduction

Interprofessional education today

A recent press release by the UK Centre for the Advancement of Interprofessional Education (http://www.caipe.org.uk/news/) stated that:

> *The quality of service delivery in health and social care, plus patient, client and service user safety, depends upon an effective workforce practising collaboratively.*

and

> *Interprofessional education can bring about the changes needed for the development of such a workforce. Practitioners need to learn together in order to be able to work across professional, organisational, and agency boundaries. Quality education that enables interprofessional learning in classroom and practice contexts is key to efficient and effective workforce development.*

Drivers for interprofessional education are international and national. Internationally, the interest in interprofessional education is high, encouraged by the publication of the WHO Framework for Action on Interprofessional Education and Collaborative Practice (WHO 2010). This offers the following definitions:

- 'Collaborative practice in healthcare occurs when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across settings'.
- '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. 13).

National drivers come from central government. In the UK, for example, see Department of Health (2000a, 2000b, 2001, 2002, 2008). Drivers also come through regulatory bodies. In the UK, these include the General Medical Council (GMC), the Health Professions Council (HPC), the Nursing and Midwifery Council (NMC) and the General Social Care Council (GSCC). Each of these regulatory bodies introduced interprofessional education into their policies, guidelines and requirements, evidencing their commitment to interprofessional education (GSCC 2002, GMC 2003, NMC 2004, HPC 2005a, 2005b, British Medical Association 2006). For example, the GMC (2009, pp. 27–28) stated that a doctor should be able to:

- Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team.
- Understand the contribution that effective interdisciplinary team working makes to the delivery of safe and high quality care.
- Work with colleagues in ways that best serve the interests of patients, passing on information and handing over care, demonstrating flexibility, adaptability and a problem-solving approach.
- Demonstrate ability to build team capacity and positive working relationships and undertake various team roles including leadership and the ability to accept leadership by others.

Similarly, the HPC, which determines current requirements for the education of allied healthcare professionals (AHPs), states that AHPs should be able to:

- Work, where appropriate, in partnership with other professionals, support staff, service users and their relatives and carers.
- Contribute effectively to work undertaken as part of a multidisciplinary team.
- Demonstrate effective and appropriate skills in communicating information, advice, instruction and professional opinion to colleagues, service users, their relatives and carers.
- Understand the need for effective communication throughout the care of the service user.

(HPC 2009, pp. 6–7).[2]

The Quality Assurance Agency (QAA) benchmarking statements for pre-registration programmes in the UK are considered to have had the greatest impact on interprofessional education (Barr 2007). These benchmark statements form one of the external reference points for judging quality and standards of provision in higher education at subject level, operating within an integrated Quality Assurance (QA) policy framework (Hargreaves & Christou 2002, Laugharne 2002). They were approved for social work (QAA 2000), all healthcare subjects (see, for example, QAA 2001) and medicine (QAA 2002). These statements, underpinning the major review process, include the directive that students must be prepared to adopt multi-professional, interprofessional and multi-agency approaches to health and social care (Carpenter & Dickinson 2008). Therefore, interprofessional education had to be offered by UK universities to all pre-qualifying health and social care students (Department of Health and QAA 2006, Pollard 2008).

In 2006, the QAA published a statement of common purpose for health and social care professions. This was developed by a multi-professional and multi-disciplinary team to facilitate the integration of service delivery and continuing growth in interprofessional education. Their work was in keeping with the emphasis that Barr (2007) makes about the challenge being not to merge one discipline or professional activity into another but to integrate perspectives to make the most of their combined benefits. The statement of common purpose stipulates that health and social care staff should respect and encourage the skills and contributions which colleagues in their own and other professions bring to the care of patients (QAA 2006, Barr 2007). The statement serves to support colleagues within their working environments and develop their professional knowledge, skills and performance. Furthermore, it emphasises that colleagues are not expected to take on responsibilities that are outside their level of knowledge, skills and experience.

Internationally, a similar commitment to interprofessional education within health and social care curricula can be observed. For example, the Australian federal, state and territory governments recognised the importance of establishing a health workforce that is adaptable and able to effectively work in teams and across discipline and sector boundaries, facilitating health reforms (Dunston et al. 2009). The organisation, Learning and Teaching for Interprofessional Practice, Australia (L-TIPP, Aus), recently developed an agenda for national development, enhancing interprofessional practice capabilities in four interrelated areas these included:

- Informing and resourcing curriculum development.
- Embedding interprofessional practice as a core component of health professional practice standards and where appropriate, in registration and accreditation processes.
- Establishing and implementing a program of research to support and inform development.
- Establishing an interprofessional education/ interprofessional learning and interprofessional practice knowledge management system (Dunston et al. 2009, p. 21).

Such national and international requirements show commitment to interprofessional education and interprofessional practice, and illuminate an appreciation of the value of being interprofessional. The aim is to equip students with the knowledge, skills and attitudes needed to collaborate interprofessionally in practice settings, contributing to positive client outcomes (Carpenter & Dickinson 2008). These include improved communication; efficiency, cost-effectiveness and patient centredness of the healthcare team (Dunston et al. 2009, WHO 2010). Here, we argue that the development, delivery and evaluation of interprofessional curricula that lead to effective interprofessional practice benefit from a theoretical foundation and interrogation.

The role of theory

Theory is a set of propositions/hypotheses linked by a rational argument (Jary & Jary 1995). The use of theory is not simply an academic exercise. As humans, we constantly formulate theories that later underpin our actions even at the simplest of levels. To cross a road in our local community, for example, we put together a range of propositions: a car may approach from the right; it is likely that a car may also come from the left. If one looks left and right, the approach of car will be observed early enough to take avoiding action. We test out these hypotheses, each time we cross the road and find that in most cases these prove true. The 'look left look right theory' then allow us to transfer our experiences of local roads to new contexts, e.g. a road in the busy city centre.

Similarly, theory has a central role for us as practitioners, guiding us when we engage with new health and social care practices. Theory can help us articulate, reflect and potentially reinterpret our existing/habitual practices. It provides a tool with which to engage in second-order reflection in which we can stand outside of ourselves looking in on our daily practices with a critical eye (Wackerhausen 2009). We focus in this Guide on how this may be achieved in the field of interprofessional education. Our task is to take some established theories that have explained social action in other contexts and translate these into an illustrative practice scenario about the development and delivery of interprofessional education. This case study approach shows how these theories, and theory in general, are relevant for students, facilitators and curriculum developers, how they help us reach conclusions about our practices based on logical argument and how hypotheses may be generated that we are able to test either informally in our every day working practices or more rigorously through empirically based research.

Which theory?

At the planning stages of our writing, it became clear that we would have to make choices about which theories to write about in the relatively limited space of this publication. Our decisions were informed first, by the need to differentiate between theories that have application to the field of interprofessional education versus those relevant to interprofessional practice. We recognise that any attempt to write about interprofessional education theories in which we exclude theories that help our understanding of collaborative practice could raise the comment that we are separating

the inseparable. We would agree but nevertheless, for practical purposes we focus here on how theory can extend our understanding of interprofessional education, not least because it is a rather neglected subject.

Systematic reviews (Cooper et al. 2001, Freeth et al. 2002, Barr et al. 2005) highlighted that few studies directly refer to a particular theoretical framework for interprofessional education. Of those that did, most were primarily based around adult learning theory, psychological theories of group behaviour and teamwork approaches (Cooper et al. 2001, Freeth et al. 2002, Barr et al. 2005) and learning organisations (Freeth et al. 2002). The task then is one of increasing scholarship within the interprofessional education community of practice in this area and the creation of opportunities to discuss, apply and reflect on the use of appropriate theories, using theory, as we say above, as an artefact with which we reconnect to practice. The findings of the ESRC seminar series (Hean et al. 2009a) agree with Barr et al. (2005) and Meads et al. (2003) that a single theoretical orientation is insufficient in such a complex field, where different groups of learners meet for a variety of purposes at different stages of their professional development. This presents the general dilemma for education practitioners: which theory to use at a particular time and, for us, the specific problem: which theories to elaborate on within this Guide. To the more general issue first:

Participants at the ESRC seminar series agreed that a *tool box* approach to theory application in interprofessional education is required. Theories are drawn from a number of academic disciplines, including sociology, psychology, education and management are available. An example of the content of such a tool box can be seen in Table 1.

The key is to select a theory from the *tool box* for its suitability to articulate or improve understanding of interprofessional education in a particular context. Prioritisation of a single theory is inappropriate as individual theory users have very different preferences and familiarities for different theories dependent on their own unique professional and academic histories. Neither are theories mutually exclusive and during the seminar series we found overlap between a number of the theories discussed.

From a grounded theory approach, it could be argued that borrowing from the theories established in, say, psychology or sociology, may limit our ability to use theory to articulate interprofessional education more rigorously. There is a case for looking outside the *tool box* and developing theory that has originated from interprofessional education experience specifically.

It is also important to recognise that some theories are more popular than others, possibly because of their profile in the academic literature. Usually, but not always, these theories have a history of use and come to dominate. This can lead to potentially useful but less accessible theories being overlooked. Bourdieu's (1984) theory of habitus may come into this category.

The plethora of theories available, and the overlap between many of these, makes the theory tool box a potential zone of confusion. We need to develop structures that classify and inter-relate theories to help us make sense of what is available to us. Here, we propose one system with which to do this; a system that focuses on the context in which a theory might best be applied. A range of dimensions should be considered when deciding when, why and how to use a particular theory from the *tool box* in a particular context (Table 2 and Figure 1).

In the following and main part of this Guide, we have confined ourselves to three theories that we believe illustrate some of the dimensions described in Table 2. We specifically chose theories that have a clear social dimension to them as this is a key factor that differentiates uniprofessional from interprofessional education (Hean et al. 2009b). However, please note that the theories chosen reflect our interests and

Table 1. Some exemplars of tools in the theory tool box that have been applied in interprofessional education.

Name of theory	Authors who have applied the theory to interprofessional education	Brief description	Practical questions?
Contact hypothesis	Carpenter et al. (2003, 2006) and Carpenter and Dickinson (2008)	Interprofessional education brings students of different professional groups in contact with each other, under a range of predetermined conditions that promote positive attitudes to grow between professional groups	What conditions do I need to introduce into my curriculum that will generate positive attitudinal change/growth in my students? How do I know if attitudes have changed?
Activity theory	Engeström (2001)	Engestrom (2001) uses the concept of activity systems to frame the learning that takes place when parents and practitioners from different professions and organisations work collaboratively to plan and monitor the care of sick children admitted to their care	How do organisations learn from each other in an interagency context and how can this be improved?
Complexity theory	Cooper et al. (2004)	Through reference to concepts of connectivity, diversity, self-organisation and emergence we are able to make sense of complex linear and non-linear processes involved in designing, coordinating and delivering curricula. Interprofessional education is recognised as multidimensional with both predictable and unpredictable outcomes	To what degree can we plan the specific learning outcomes of an interprofessional education curriculum? When do we need to accept that some learning is emergent and cannot be planned for?

Table 2. A range of dimensions to consider when deciding which, when, why and how to use a theory.

Agency dimension	For whom would the theory be useful and how could the theory be applied differently by each individual-whether they be the policy maker, the curriculum developer, the facilitator, the student or the researcher and evaluator? A theory may be deemed useful by one group but not others. Equally, a theory may be used in one way by one group but in another way by another
Temporal dimension	When in the interprofessional education experience might the theory be usefully applied? That is, is theory being used to develop hypotheses around when interprofessional education should be delivered, e.g. pre- or post-registration? At the beginning or end of pre-registration training?
Location dimension	In which learning environment might the theory be useful? This differentiates between theories that may be useful to explore campus-based interprofessional education versus practice-based education. The location dimension and temporal dimension are to some degree linked as where education happens may depend on when it happens
Micro- vs. macro-dimensions	The micro-level refers to learning at the level of the individual student; macro-level learning has a wider remit and encompasses learning that may occur within communities, systems or organisations as a whole. For example, if the curriculum developer is focused on enhancing student learning within the interprofessional education context s/he may draw on social constructivist learning theories to articulate how this micro-level learning takes place and how interprofessional education group sessions can be better facilitated to achieve this. Alternatively, if an interprofessional education lead wishes to articulate to students the complexity of interagency working and help them manage crossing institutional boundaries between the University and different practice settings, then the use of the macro-level theories of activity theory describing the interaction of these two systems may be appropriate (see the seventh section for more detail)
Utility dimension	What task might the theory help us achieve? Might the theory have an explanatory value, e.g. in explaining the role and process of interprofessional education and why learning to be interprofessional is important for pre-registration students and how it is enacted; alternatively, the theory could assist in planning ways of delivering effective interprofessional education or in fact be used to substantiate the development of interprofessional education that responds to stakeholder evaluations

are not the only ones that could be used in the contexts addressed. Further, space does not permit a full critical debate of the chosen theories and readers are directed to sources where this debate is available.

The first of the chosen theories is the concept of social capital. We believe this to be useful in both defending the importance and need for interprofessional education and to determine what an effective curriculum might look like. Second, we explore the usefulness of the more commonly used social learning theories applied to adult learning. These show their value in the development of learning and teaching activity and the planning and delivery of interprofessional education. Third, we believe educating health and social care practitioners interprofessionally involves changing ways of constructing knowledge as well as changes in learning experiences and working practices. Looking at curricula through a sociological theoretical lens, as we have done here, can help us understand and explain social processes happening within learning groups. One of the sociology's central tenets is a view of knowledge as socially constructed, i.e. developed, codified and transmitted through social processes and organisations, including professional curricula, professional regulation and higher education institutions. Sociology's scepticism encourages questioning of the aims of policies and activities supporting interprofessional learning and working from the standpoint of different social institutions and actors (different interest groups, agencies and agents).

A case study approach

In the following sections, we summarise each of the chosen theories and explore their utility, by applying them to a case study that describes the work of a fictional but typical interprofessional curriculum lead. The main case study material is presented in Case Study Boxes 1–4 throughout the Guide. Each of the four sections deals with a different element of the interprofessional leadership role along a continuum of time and is written in the voice of an educator in such a role. We have also included Comment Boxes which focus on ways in which learning about theory deepens the thinking of characters from the case study. You will also find Thinking Points and Suggested Further Reading lists.

In Case Study Box 1, our interprofessional lead has recognised that designing and delivering interprofessional modules may present some challenges. Scepticism is one of these, a common response to a new initiative that promises to introduce new material into what can seem an already crowded curriculum. As Hammick and Anderson (2009) remind us, introducing interprofessional education means that 'we need to align language, learning approaches and curriculum time tables . . . and arguably the most challenging, we need to align people' (p. 219). Our interprofessional lead is sure that having someone speak about why interprofessional education is vital in an undergraduate programme, using ideas from another academic discipline, in this case, social capital from the field of social psychology, will go some way to achieving this alignment, injecting the necessary intellectual debate and enthusiasm she hopes for her committee.

Social capital and its application to interprofessional education

Social capital is a heuristic concept used to describe, understand and measure the advantages gained by individual(s) who are part of a social network (Hean et al. 2003). Social capital became popular in the healthcare field to describe the health advantages of being part of a social network and social inequalities in health (Gillies 1997). It is underutilised, however, as a tool to understand the advantage and processes involved in interprofessional working and education. We focus on social capital as a tool to help

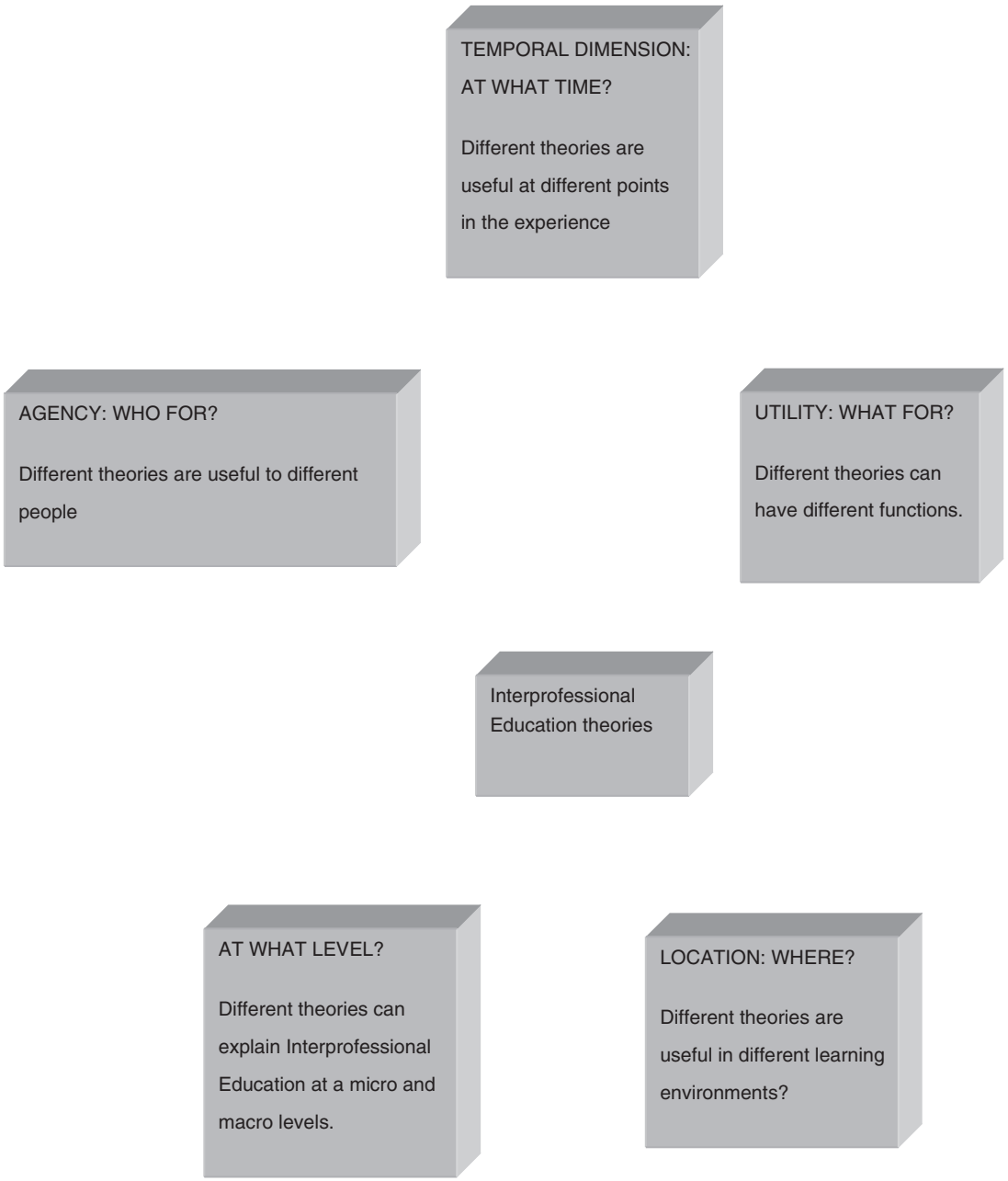

Figure 1. Summary of the dimensions/categories into which theories may fall.

reconceptualise the social network represented in the interprofessional student learning group and explore the potential advantage gained by students who participate within an interprofessional curriculum using this type of activity. Our contention is that students in these groups learn to build personal social capital and invest in an interprofessional team. They are hence being better prepared to collaborate on entry into practice.

Social capital can also be used to describe the dynamic and accumulative effect of being part of these learning groups and the potential inequalities that may arise from being excluded from that network. In this way, social capital theory helps us articulate the potential structures and processes within an interprofessional learning network and the advantage that this type of learning may facilitate.

There is a central social advantage from being part of an interprofessional learning group or network: knowledge transfer between group members. Acquiring this knowledge leads to an increased understanding of the role of other professionals, an increased ability to articulate one's own professional role and a gain in the competencies needed to work in an interprofessional team. When this is established in training, learning within practice is more easily facilitated and interprofessional knowledge and competence accumulates in a way that would not be possible if the student had not been part of an interprofessional learning group during their initial education. Much of the above is common sense but the theory of social capital gives us the vocabulary with which to mount a defence of interprofessional education and its importance and advantage alongside uniprofessional education.

Case Study Box 1. Being an interprofessional education lead: working with others.

20 October 2008

I have just been appointed the interprofessional education lead in the newly established Faculty of Medicine and Health Sciences, at the University of Hope. When the Dean of Faculty invited me to take on this role I felt flattered, particularly as I had only recently been appointed as a lecturer on the five year medicine programme. She gave me some policy documents and a list of interprofessional education learning outcomes to digest, with a directive to develop an interprofessional education programme within the Faculty. The Dean also said there is a small staff development budget for this initiative.

In response, I've set up an Interprofessional Education Curriculum Planning Committee to develop interprofessional education modules, incorporating these learning outcomes in a consistent way across each level of study, in all programmes within the Faculty. The members include all of the Faculty's Award Leaders to ensure professional representation from the medicine, nursing, radiography and physiotherapy programmes. To support the validation of this interprofessional education programme, the Dean has encouraged me to ensure that service users and students are also invited to be members to ensure their views on interprofessional education course development are heard.

Some of the committee members have already expressed doubts about the value of interprofessional education. One comment was that it pushed more important topics out of the curriculum and another complained that he would have a job convincing his colleagues that they should become interprofessional facilitators. It would be helpful for them to hear why it should be part of the undergraduate learning experience from an external speaker.

I am keen that the doubts of some in the team are considered and that I create a forum in which we can inject new ideas and enthusiasm into the delivery of this interprofessional programme. I've also decided that we will need to get to know about each other if we are to work together effectively. Perhaps I could use the staff development budget to plan a workshop and invite the keynote speaker I heard at last year's Interprofessional Education Tomorrow conference to introduce it. He spoke about the application of social capital theory in interprofessional education. A similar presentation to the Education Curriculum Planning Committee, followed by group activity, could act as a catalyst to stimulate discussion and debate that could set the foundations for a new and exciting interprofessional curriculum in the Faculty, one underpinned by sound theory and research evidence.

Later...

The guest speaker led a workshop with members of the Education Curriculum Planning Committee, with an introduction to social capital and its potential application to interprofessional education.

After this introduction, committee members participating in workshop were asked to generate a range of hypotheses that related to the development of the interprofessional curriculum (Boxes 2–5).

Case Study Box 2. Being an interprofessional education lead: designing interprofessional learning.

5 January 2009

It's the second meeting of the Interprofessional Education Curriculum Planning Committee. The good news is that four service users and two pre-qualifying students attended the meeting. However, not all Award Leaders prioritised attendance! This meant that I had to chase some colleagues for their responses to suggestions for interprofessional education curriculum development. At times I wondered if we would ever reach agreement about the length and duration of the modules given the varying durations of programmes, different academic abilities of students and the need to work with some nightmare timetabling clashes. The social capital workshop was very helpful for us to organise our thinking and reach a consensus. However, for some committee members, the use of social capital was out of their current educational experience.

Further the time pressures on delivering an interprofessional education curriculum meant that they did not have the luxury of exploring and generating evidence that would support the social capital propositions raised. Falling back on tried and tested education/learning theories allowed them to remain within their theoretical comfort zones and rely on more established theoretical underpinnings. At our next meeting we have agreed to discuss the design of the learning experience and we have to decide on content and assessment. From today's meeting it's clear that I need to do my homework on this before the meeting and present some options: otherwise we will have a learning experience driven by those with the strongest opinions!

Case Study Box 3. Being an interprofessional education lead: responding and rethinking.

23 June 2010

Well, thank goodness, the first module of the interprofessional education programme is over. There were a few teething problems with room booking clashes and facilitators either turning up unprepared or indeed, not turning up at all! However, nothing prepared me for our students' evaluations of their interprofessional education experiences. Quite a few made it very clear that they did not enjoy the experiences at all. They didn't see the relevance of it to their particular practice; didn't like the timing of the modules in relation to their clinical placements or it being timetabled on a Thursday afternoon. This list goes on: some felt that some students in their group didn't put any effort in to the formatively assessed activity, resulting in unbalanced workloads, and some felt overpowered by others in the group.

More positively, most students thought their group was the right size and they liked the combination of students from different professions. There were also positive responses to the way we organised the learning around an authentic practice related issue and gave them freedom within their groups to take whatever direction they wanted to in terms of a solution.

So now I'm working with the Interprofessional Education Curriculum Planning Committee to address the major issues that need revising in preparation for the next academic year. It's a real struggle to secure enough interprofessional education facilitators. Many of those who participated this year are telling me that, owing to other commitments, they are unable to be an interprofessional education facilitator next year. There seems to be a feeling amongst some of them that interprofessional education may lead to students from other professions knowing too much about how to do the work traditionally done by practitioners from their profession. One or two have told me that they feel very insecure during the interprofessional learning groups, mainly it seems because questions arise that they don't know the answer to. Thank goodness enough of them are willing to continue and want to better understand the student's comments.

And I need a way to help us all understand why it felt such a challenge and how to mitigate that next year, especially for the students but I just don't know where to start. We need to think clearly about the way forward and that's not something that can be done in a two hour meeting. Maybe an away day as I still have money in the staff development funds? I shall have to do some sound preparation if we are to get useful outcomes that everyone agrees with and are practical enough to develop the modules in a way that satisfies students and staff.

Case Study Box 4. Being an interprofessional education lead: a theory informed curriculum.

30 September 2011

The first module of the revised interprofessional education curricula starts tomorrow. I'm nervous but more confident than this time last year that the module will run smoothly and be more acceptable to students and staff. There is much more support now from the facilitators and they say they are feeling more relaxed now they understand that it will never be possible for them to answer all the student's questions. We even have some spare staff to take over if anyone reports sick . . . so different from last year. A few of them are pairing up to do some interprofessional team teaching; this way interprofessional socialisation will be role modelled by staff. We've made some changes to the delivery and content of the interprofessional modules including providing sufficient time for students from the different professions to get to know each other in informal ways with shared travel and longer coffee break times. The curriculum now includes some time for the facilitators to talk to their students about professional knowledge and the idea that their discussions about patient care or service delivery should aim to bring together their different knowledges.

The Dean has asked me to write a briefing paper on these changes She's interested in why we've changed certain aspects and left others alone and, in particular, in what sort of progress we've made towards having a relevant, effective and efficient interprofessional curriculum that is integrated with the other parts of all of our professional programmes (Barr & Ross 2006) Apparently, one or two of the Faculty Awards staff who are on the Interprofessional Education Curriculum Planning Committee want to take that approach with some of their uniprofessional modules. Looks like we've set a trend! I'll start it now but won't be able to finish it until the feedback from students and staff is analysed. At least this year our evaluation is theory-led –we're now using realistic evaluation which involves collecting more qualitative data and doing this in a more systematic way so we can analyse the links between the education process, mechanisms and outcomes. We've asked the students and service users on the Interprofessional Education Curriculum Planning Committee to participate in the collection of this data. It all feels very different to last year . . . I'm really enjoying being the interprofessional lead.

Table 3. Assumptions underlying ALT or 'Andragogy'.

Number	Assumption underlying ALT
1	Adult learners need to know the relevance of what they need to learn before undertaking to learn it
2	Adults prefer responsibility for their decisions and desire to be viewed as capable of self-direction
3	Adults accumulate a greater volume of experience, which represents a rich resource for learning and necessitates individualisation of learning strategies
4	Adults become ready to learn things when they need to know them in order to cope effectively with real life situations
5	Adults have a task-centred orientation to learning and like to feel free to focus on the task or problem
6	Students can work collaboratively and in dialogue with others with mutual trust and respect, between both peers and lecturers, to shape and deepen understanding
7	While adults are responsive to some external motivators, their most potent motivators are internal

Source: Knowles (1990) and Kaufman (2003).

Attributes of social capital

The social. A concept analysis of social capital (Hean et al. 2004) highlighted some of its global attributes and component characteristics. Social capital combines two concepts. The first is the *social* component. This exists in or through the quality, quantity and context of relationships (e.g. Coleman 1988, Vimpani 2000, Mitchell & Harrison 2001). In interprofessional education, the social capital that may accumulate within an interprofessional team in practice is mimicked, or in fact begins, in the interprofessional learning group. The level of social capital generated is dictated by the quality of the relationships formed between student practitioners in their learning interactions. In particular, in interprofessional education, this happens during the experience of learning about, from and with each other.

The capital. The second concept relates to the *capital* of social capital. A Marxist understanding of capital sees it as both a dynamic and durable phenomenon. Bourdieu describes social capital as '*an unceasing effort of sociability, a continuous series of exchanges in which recognition is endlessly affirmed and reaffirmed*'; an '*aggregate of the actual or potential resources which are linked to possession of a durable network*' (Bourdieu 1997, pp. 51–52). As interprofessional education learning groups are of limited duration and disband at the end of the interprofessional education intervention, the durability of any advantage gained within an interprofessional learning group may at first be questioned. However, the learning, skills and trust of other professional groups created within the interprofessional education network, if managed correctly, encourages the student practitioner to reinvest in future collaborations when joining interprofessional teams in practice. In this way, interpersonal trust in interprofessional learning group members becomes generalised trust of other professional groups in practice, and the advantages of working in a team accumulates. Greater detail on the concepts of the dynamic nature of social capital in formal groups, such as an interprofessional education group, and ideas of investment and reinvestment in formal social networks is available in Hean et al. (2003).

Capital is also a concept that enables us to explore issues of power differentials and social inequality. The exclusion of the patient from active participation in the interprofessional network means that, whilst they are essentially the reason for collaboration, interprofessional working may enhance the lives of professionals (see column 2, Table 3), but excludes the patient from the potential advantages of active group membership. Similarly, if a student does not participate in an interprofessional education learning network (because interprofessional education is not offered, because it is not a

compulsory part of the curriculum or if a student is ostracised from the learning network by other student members), the advantage gained through this social network is afforded to some but denied others. Similarly, not all professionals come to the interprofessional education learning group on a level playing field. Students may bring in social capital (and other forms of capital also, e.g. human capital) from their professional groups (or other networks) that afford them greater status, skills and/or experiences. This enables them to take advantage of the knowledge transfer that takes place in the interprofessional education group to a greater degree than other students denied these networks.

Social capital is a dynamic concept that describes the investment and reinvestment in social networks and the accumulation of social capital through this process. In the interprofessional education context, students transfer their learning from the social network of interprofessional education to the social network of the interprofessional team. In social capital terms, this can be articulated as students reinvesting the interprofessional skills and interprofessional trust built in interprofessional education into the practice network and accumulating greater social capital as a result. There may be numerous reasons why this reinvestment is blocked breaking the capital generation cycle.

Social capital as a function. Social capital is also defined by its function (Coleman 1988), exemplified by facilitation, co-operation, learning (e.g. copying and pooling of skills) and generation of trust, gossip, reputation or regulation (e.g. Coleman 1988, Collier 1998, Kilpatrick 2003). It may serve several purposes simultaneously (e.g. Coleman 1988, Putnam 1993, Astone et al. 1999). For example, social capital generated in an interprofessional learning group where students working on a common task may lead them to learning about the roles of the other practitioners and developing academic or practice-based skills.

Social capital as a multidimensional concept. Social capital is multidimensional, a factor that, along with its capital nature, differentiates it from many of its related concepts such as social support. Part of the construct's strength is that together the dimensions provide a heuristic and encompassing view of the social advantage that may develop within the interprofessional learning group. An exploration of these dimensions, as seen below, can help curriculum developers pinpoint where interprofessional learning interactions can be enhanced.

Network characteristics

A first dimension in this pluralistic framework is the description of the social network in which social capital is generated. The type of network is of interest, and can range from membership in the informal (e.g. family, friend and neighbourhood networks) to the formal (e.g. sports clubs, farming associations). An interprofessional learning group is an example of a formal social network created and legitimised through the interprofessional education curriculum. The features of this network can be partitioned into the *physical* (e.g. network size; heterogeneity, horizontality – Tijhuis et al. 1995, Veenstra & Lomas 1999, Cattell 2001) and *affective* characteristics (e.g. social cohesion; feelings of solidarity – Kawachi & Berkman 2000, Kilpatrick 2003). Behavioural measures of frequency and level of participation in the network may also alter the amount of advantage obtainable from the network (Putnam 1993, 1995, Baum et al. 1999, Veenstra & Lomas 1999, Veenstra 2000). These network characteristics can be used to describe the nature of the interprofessional learning group. Curriculum developers need to consider how these network characteristics can be optimised to maximise the social advantage that learning in an interprofessional group can achieve. Some of the propositions from our hypothetical Curriculum Development Committee in relation to this dimension are presented in Comment Box 1.

Trust. Another component attribute of social capital is trust. Two forms exist, depending on whether or not the person to be trusted is known personally to the respondent (Baum et al. 1999, Veenstra 2000, Mitchell & Harrison 2001). In interprofessional education, interpersonal trust is exemplified by the trust that builds between students in the interprofessional learning group. When students rely on a fellow student to pull their weight in the team task that is an example of interpersonal trust in action. Trust, however, in those with whom individuals have no first-hand knowledge, i.e. generalised trust (Cox 1997) is to a degree a more important phenomenon. Trusting in the goodwill and professional ability of other professional groups facilitates the working of teams that may be geographically dispersed or transient; and the health and welfare system as a whole. It is the transfer of interpersonal trust developed in fellow group members through interprofessional education into the generalised trust in others in different professional groups in general and with whom neophyte practitioners will collaborate in the future, that is a key strength of interprofessional education. Facilitators and curriculum developers should pay attention to the way curricula can be developed to include tasks and a process of group facilitation that can build interprofessional trust both at a personal but more importantly at a generalised level.

Resources. Another attribute of the network important to the generation of social capital are the resources the social network offers to its members (Vimpani 2000). Two forms of resource are relevant: those external and those internal to the individual (Cowley & Billings 1999). External resources exist outside of the individual. They are accessible only through interaction with others within that same network. They take both physical (e.g. financial and other material resources) and abstract forms, e.g. a collective skill base of people in the network, willingness of network members to offer assistance (Tijhuis et al. 1995, Cattell 2001). In the interprofessional student group, one external resource is the knowledge that each member holds of their individual profession, that they can share with other members of the group if so requested.

Coleman (1988) describes the importance of social capital to the generation of human capital. Human capital describes the changes in a person brought about by increased skill/knowledge leading to new behaviours. The example he uses is the potential of a highly educated family network (high in

Comment Box 1. Some propositions from the curriculum development committee on the composition of interprofessional learning groups based on social capital theory.

After the talk by the invited speaker, the curriculum development committee discussed how their new understanding of social capital could be applied to the development and delivery of interprofessional education. They first considered some of the ideas on the network dimensions of social capital and explored what the optimum affective and physical characteristics of an interprofessional education leaning group should be. In other words, they considered the ideal composition of the student interprofessional learning group. They raised the following questions and addressed these with hypothetical solutions as below:

- **What size of interprofessional education group will maximise positive learning with, from and about each other?**

The Committee reflected on the talk on affective network characteristics and discussion of how larger groups may have lower levels of cohesion and strong working relationships are less easily formed. However, the speaker also suggested that groups must be sufficiently large, to contain members with a wide enough range of knowledge and skills to effectively achieve the task as a team. The Committee proposed that interprofessional learning groups between 6 and 8 be created, as these are likely to contain students with a range of skills but are not so large that cohesion is compromised.

- **How many professions should be represented within the group and which professions specifically should be combined in one group for maximum effect?**

One committee member insists that teaching collaborative skills can be done uniprofessionally and wants to pull out from the interprofessional education programme. A uniprofessional approach brings together a group of neophyte professionals that share common skills and knowledge. The speaker, participating in the committee's discussion, reminds them that whilst this homogeneity may promote strong group cohesion, it mitigates against any exchange of skills or knowledge of each other's professional group. A uniprofessional group is less likely to address the group task in an innovative fashion (Borrill & West 2000). A professionally heterogeneous group is important in the development of bridging capital (relations between different professional groups). However, bonding capital (relations within the same professional network) is important also (Looman & Lindeke 2005, DiCicco-Bloom et al. 2007). The Committee agreed that therefore the group should have at least two of each profession; so, both forms of capital can grow within the interprofessional student group.
They also concluded that when planning the heterogeneous make-up of the group, some thought should be given to the type of knowledge and skills that each professional group brings to the task. This is facilitated if the task itself is centred on a clinical context or authentic learning context. For example, the mental ill health of the prison population is unacceptably high. The Committee discuss the context of Offender Health, a particular interest of one of the committee members. Improved mental health assessment and reporting when defendants pass through court prior to prison is essential (Hean et al. 2011). The committee member suggested a student task could centre on the enhancement of psychiatric reports requested of the mental health services by the criminal justice system. An interprofessional learning group could then bring together two mental health students, two medical students, two social work students (and ideally two law students) to explore and exchange their professional perspectives on this challenge.

- **How frequently should students interact with the interprofessional education group during their interprofessional education task?**

The committee decided that this will vary by task and suggest that in the early stages of an interprofessional learning activity, frequent interaction and participation is required to build the social relationships required for the team's success. The Committee believe frequent participation is best achieved if interprofessional education modules are delivered as a block over a 2-week period.

- **What role does each member play in the interprofessional education group and what should be their level of their involvement in the group task**?

The committee reflected on the influence of levels of participation in a network on social capital generation. They concluded that students should be encouraged to take an increasingly active role in the interprofessional learning group. Where the facilitator may initially lead the group, students should be encouraged to take over this leadership as the team develops. They should be encouraged to discuss and rotate roles within the team, alternating between chair and scribe, for example. Active participation in the group should be encouraged through promoting a commitment to shared goals and the setting ground rules.
In all of the above suggestions/discussion, the committee recognised that much of their discussion, although with a strong theoretical underpinning, now required a strong evaluation.

human capital) to foster higher educational attainment (and transfer of human capital) to their children. This is compared to families in which human capital (in this case education) is lower. However, for this transfer to occur, a strong social relationship and contact between the child and the parent is required (social capital). This translates well into the interprofessional education student group. Students come to the interprofessional education learning group with a wealth of human capital (the knowledge and skills from their own professional group); However, if the interprofessional education student group does not communicate effectively, does not cooperate with each another, is unwilling to spend time with each other to explore each other's professions, then learning with from and about each other does not happen. If the social capital is missing from the interprofessional education group, no human capital (increased skills and knowledge of other professional groups) will accrue.

Resources internal to the individual are also worthy of consideration. These are necessary in many instances to help the individual access external resources resident in the network. Internalised knowledge of whom, when and where to go for help, if required, is an example of this (Bourdieu 1997, Kilpatrick 2003).

Norms and rules. The final attributes of social capital are the norms and rules governing the social network. Norms are those unstated rules or standards that often govern actions during informal or spontaneous social relations. Whilst deviation may be punished by socially imposed sanctions enforced by other group members, compliance with these norms may promote spontaneous co-operation between individuals (Cox 1997, Collier 1998, Fukuyama 1999). Such cooperation either restricts or facilitates individual and group action for the benefit of the whole (Coleman 1988).

The norms and rules in the interprofessional learning groups are not well understood. Complaints of freeloading, especially when the interprofessional learning group is assessed as a group, are often mentioned in the interprofessional education student groups, as in any team. A curriculum developer needs to consider the rules of interaction that should be prescribed when designing interprofessional education activities, or the degree to which norms should be allowed to develop naturally within the group as they begin to work together.

Some practical questions and solutions that arise from the discussion of the trust, resources, norms and rules dimensions of social capital by our hypothetical curriculum committee can be seen in Comment Box 2.

Comment Box 2. Some propositions by the Curriculum Development Committee on building Trust, Resources and Norms of engagement within the interprofessional learning group.

After discussion of the desired characteristics of the interprofessional learning group, the Curriculum Development Committee turned their discussion to the processes that take place within the groups and applied the new understanding of social capital to underpin their recommendations. They asked:

- **How do we build trust in the interprofessional learning group?**

The committee believed that the role of trust and trust building should be made explicit to students and that a role of the facilitator is to explain the importance of developing interprofessional trust. They should engage students in trust building activity. Trust grows within an environment of interdependence and as such has an element of risk associated with it. Activities may be designed in which each team member holds unique skill or knowledge sets that they must communicate clearly, transparently and perform competently. Team members should be encouraged to behave in consistent and predictable ways, be ready to delegate and share control of the task as well as show a concern for each team member. It should be made clear that behaving in this way during a joint task builds their professional reputation and shows them to be trustworthy to other members of the team, particularly members of other professions upon whom they will rely during the task (Tomlinson & Lewicki 2003, Pullon 2008, McMurtry 2010).

- **What are the external resources of the interprofessional education student group?**

The committee discussed the skills, knowledge and experiences that different professionals bring to their interprofessional education group. Again, they believed that an authentic clinically related task facilitates the identification of these external resources. They referred back to their earlier discussion (Box 2) about a student task developing a template for a psychiatric report required to transfer information on the mental health of a defendant between the Mental Health Services and Criminal Justice System: Student lawyers bring an understanding of the legal system and the decisions facing a magistrate/judge when dealing with defendants. If magistrates are dealing with defendants with mental health issues they need to decide whether diversion from the criminal justice system to a secure unit, a community order or a custodial sentence is required. However, to make this decision they must rely on the knowledge/resource of the mental health professional to understand the public risk the defendant poses and the relationship between their mental illness and the crime committed. The Mental Health professional holds this knowledge/resource but needs to understand in turn the legal dilemmas facing the magistrate to be able to provide information in their reports that will be useful for the magistrate. Law students and mental health student nurses, for example, in a common task to enhance the template for the psychiatric report satisfy the requirements of both agencies. They should be encouraged to share information resources each informing the other of the knowledge requirements of each agency and how communication could be facilitated between them (Hean et al. 2011).

- **Are norms and rules of team working, resource/information sharing in place?**

The Committee recognised that norms are important to the working of the interprofessional learning group but that the students groups have only limited time together and there is insufficient time available for norms of team working to develop naturally. They agreed for students to be encouraged to set clear ground rules, especially with regard to roles and issues of freeloading, on the way they intend to work and interact over the task. If these are not set explicitly and early on, the group is unlikely to be successful.

In conclusion, social capital is a concept that was can be used by our curriculum lead and her committee to convince sceptics of the advantages of learning in a group and learning in an interprofessional group. They applied dimensions of social capital practically to produce some suggestions about how the curriculum could be designed and delivered with this theoretical underpinning. There is much scope to apply this theory further, not only to defend the form of delivery but also as a tool with which to explore/evaluate the processes and short and long term outcomes of the curriculum.

Thinking point

Social capital has been used as a tool to explore the student learning group. It could equally be used to explore the benefits, challenges and processes of the education planning committee itself as a formal network and hence a source of social capital. The size, heterogeneity and frequency of participation, roles, cohesion, trust, resources and norms of the committee are the keys. Through this lens, the composition, processes and outcomes of this committee might be framed to form testable propositions, through which the management and delivery of interprofessional education could be enhanced.

Suggested further reading

Bourdieu P. 1997. The forms of capital. In: Halsey AH, Lauder H, Brown P, Stuart Wells A, editors. Education-culture, economy, and society. Oxford: Oxford University Press. pp 46–58.
Coleman JS. 1988. Social capital in the creation of human capital. Am J Sociol 94:S95–S120.
Hean S, Cowley S, Forbes A, Grifiths P, Maben J. 2003. The M-C-M' cycle and social capital. Soc Sci Med 56:1061–1072.

Using education theory to inform the design of an interprofessional curriculum

The second section of our case study shows that our lead has quite a task ahead of her if she is to get agreement about the design and content of the interprofessional education modules by the Interprofessional Education Curriculum Planning Committee. This may not be surprising given their different backgrounds and interests in the initiative. She decides that convincing the most sceptical members will be easier if the options she presents reflect good scholarship. She is also aware that some members might find academic language off putting; so, whatever she writes needs to be informed by evidence and written in accessible language. Her aim is that they should work towards developing a theoretically rich curriculum design, underpinned by evidence and accompanied by a clear, agreed and long-term resource plan (Hammick & Anderson 2009).

On review of the literature review she selects two recently published papers (Mann et al. 2009, Charles et al. 2010) that reported how two different education theoretical frameworks were used in the development and design of interprofessional education initiatives. Her plan includes making a list of the benefits of each theoretical framework and factors that need to be considered in the context of the University and Faculty they all work in. She will also outline instructional approaches used in each of the interprofessional education models and summarise how they were implemented at each respective higher education institution. Our lead hopes that these examples will help any of her colleagues who find reading about theory a challenge, enabling them to see how theory can be used effectively to underpin interprofessional education curriculum development. She believes that this will be a good point to

start discussions at the Interprofessional Education Curriculum Planning Committee's next meeting.

Adult learning and scaffolding in interprofessional education: views from the literature

Adult learning theory (ALT) or andragogy, developed by Knowles (1984, 1990), has tended to be the theory most often associated with interprofessional education (Craddock et al. 2006, Carpenter & Dickinson 2008). ALT is useful to curriculum developers, facilitators and students and the key principles underpinning this theory are presented in Table 3.

The successful application of ALT has been identified as a key mechanism for well-received interprofessional education (Hammick et al. 2007). It encourages students, as learners, to move through a series of developmental stages to achieve the ability to engage in transformative learning (Merriam 2004, Mezirow 2004). This is referred to as the highest potential for understanding, emphasising the importance of interprofessional education curriculum developers' roles to draw on education theory to create learning opportunities that enable students to become more reflective and critical, more open to the perspectives of others, less defensive, and more accepting of new ideas (Stone 2006). Furthermore, it illuminates the crucial role of facilitators, facilitating interprofessional education effectively initiatives to enhance students' learning experiences (Miller et al. 2006, O'Halloran et al. 2006). Facilitators therefore need to have a good knowledge of education and group learning theories, be able to manage group dynamics; have practical skills in problem-solving and encourage students to take responsibility for their own learning. They need to be able to think interprofessionally with experience and confidence (Glen & Reeves 2004, Bjorke & Haavie 2006).

In the interprofessional education context, ALT commonly appears as a pool of pedagogical approaches that encourage students to activate prior knowledge and build on existing conceptual knowledge frameworks (Kaufman 2003, Wood 2003). Summaries of commonly used pedagogical approaches, available for curriculum developers to use, and key references for further reading to illuminate their utility in interprofessional education are presented in Appendix (Table A.1). However, there is a need for curriculum developers to recognise and articulate the constructivist roots of ALT (Dewey 1966, Piaget 1973, Vygotsky 1978), underpinning the rationale for interprofessional education curriculum development decisions. It is therefore posited that adult learning applied to interprofessional education should be viewed as a context in which constructivist learning theories are applied as opposed to a theory in isolation (Hean et al. 2009b).

ALTs may be usefully applied at the outset of curriculum development, for all pre- and post-qualifying interprofessional education initiatives, following the agreement of learning outcomes. Such application guides the selection of pedagogical approaches appropriate for students' levels of study. For example, students studying in the first year of a pre-registration programme (i.e. Further and Higher Education Qualification [FHEQ] level 4) or early pre-clinical medical studies tend to absorb material without too much thought as to where the knowledge is taking them (Biggs & Tang 2007). Curriculum developers may therefore use structured interprofessional education tasks, encouraging students to begin to participate actively in their learning. Furthermore, students studying on a continuing professional development programme (FHEQ7) or during clinical studies should be encouraged to engage actively in the management of their own learning (Ibid.). Interprofessional education curriculum developers may therefore use a problem-based learning approach when developing post-qualifying programmes.

Constructivist learning theories have a key role to play in both campus-based and practice-based interprofessional education. The location of interprofessional education initiatives is influenced by logistical issues, including overstretched workloads, pressures on service provision, students' lack of practice experience and financial constraints (Guest et al. 2002, Robson & Kitchen 2007). It is believed that placement-based interprofessional learning opportunities are preferable to campus-based opportunities as it enables students' learning to be embedded in a relevant context (Guest et al. 2002, Reeves & Freeth 2002, Young et al. 2007). However, where placement-based learning is not logistically viable, there is widespread agreement that stimulus materials used in campus-based interprofessional education initiatives should be linked to practice settings, helping to bridge the theory–practice gap (Cooper & Spencer-Dawe 2006, Wright & Lindqvist 2008, Pulman et al. 2009). Constructivism can therefore be effectively used to inform decisions regarding the learning and teaching methods used, enabling students to learn and work interprofessionally in practice settings; or learn interprofessionally in campus-based settings, using case-based stimuli.

Constructivism considers the process of learning and includes both cognitive constructivism and social constructivism, both of which have utility in interprofessional education. Cognitive constructivism is concerned with the process of how learners learn in relation to development stages and learning styles (Dewey 1966, Piaget 1973). A key component of cognitive constructivism is self-directed learning, facilitating the integration of new knowledge and understanding into the personal and professional context of the individual (Chastonay et al. 1996, Wood 2003). This enables students to develop lifelong learning skills and emphasises (1) curriculum developers' roles in organising learning and teaching, so that learning is within the learners' control; and (2) facilitators' roles in facilitating interprofessional education learning opportunities.

By enabling learners to become active participants in interprofessional education interventions, a deep approach to learning is encouraged (Spencer & Jordan 1999, Kaufman 2003, Wood 2003). This facilitates the transfer of learning, enabling students to extend learning from one context to new contexts (D'Eon 2005).

Thinking point

Many theories overlap and complement each other. In the discussion of ALT, a deep approach to learning allows for the transfer of learning from one learning context to another. Similarly, in a discussion of the generation of social capital in the interprofessional student learning group, it is proposed that social capital is reinvested in interprofessional teams in practice. In both approaches, the transfer of learning is fundamental from one context to another.

However, it is social constructivism, embedded within the context of adult learning that is believed to have greater use in interprofessional learning (interprofessional learning) (Hean et al. 2009a, 2009b). Influenced by Vygotsky (1978, 1986), social constructivism emphasises that learning is mediated by the environment, and social interactions help cognitive development and shape learners' knowledge and comprehension (Young 2007). Learning in interprofessional education is conceptualised as something that occurs interprofessionally and which is specific to its social, cultural and historic context. Here, learners share their knowledge and understanding, participating in collaborative interprofessional learning activities to negotiate meaning. Knowledge and understanding is therefore developed not as individuals but as a group (Maddux et al. 1997).

These interprofessional learning activities use instructional approaches including problem-solving (Craddock et al. 2006) and anchored instruction (Barab et al. 2000) to situate learning in realistic problems, enabling students to experience the same professional dilemmas facing health and social care practitioners in practice. In interprofessional education anchored instruction through the use of case-based learning or problem-based learning which has been tailored to professions represented in the interprofessional learning group, encourages students to become actively engaged in learning. Maddux et al. (1997) emphasised the need for instructional materials used to include rich resources which students can access to collaboratively explore how to solve the problem. The use of anchored instruction is an emphasis of both cognitive and social constructivists. The former emphasises the need to give students interprofessional education opportunities to consider and work on problems; and the latter emphasises the need for members of interprofessional learning groups to work together to solve problems.

Vygotsky (1978) felt that students' learning was mediated *via* socio-cultural tools such as language or a peer. He introduced the concept of the 'zone of proximal development' (ZPD), which argues that students can, with support, master concepts and ideas that they cannot comprehend in isolation (Jarvis et al. 2003, Hean et al. 2009b). Such development employs the use of support systems (scaffolding). For example, facilitators, more experienced peers and computer-based technology support sharing, negotiating and constructing knowledge in an interprofessional context. However, concerns have been reported that some facilitators may have limited experiences of guiding rather than directing student learning in interprofessional education initiatives (Miller et al. 2006, Rees & Johnson 2007). Facilitator training sessions are therefore needed to prevent 'cultural lag' (Colyer 2008) and reinforce the philosophy behind interprofessional education, providing a forceful argument in favour of the need for more staff training opportunities.

The facilitator may be seen as a socio-cultural tool with which to encourage social learning, but so too is the computer. Computer-based technology, as a support system, can facilitate socially constructed learning and provides fundamental tools with which to accomplish interprofessional education goals. Simultaneously, its use has the potential to overcome intra-institutional barriers relating to, for example, timetabling and shift incompatibility, and issues of geography and work, both clinically and educationally, which can be a major obstacle to introducing workable interprofessional education initiatives (Finch 2000, McPherson et al. 2001, Morison et al. 2003, Charles et al. 2006). Indeed, there have been examples of innovative strategies used to overcome such logistical issues, including the use of blended learning *via* a simulated web-based community learning resource (Wessex Bay), introduced within an interprofessional education curriculum at Bournemouth University (Pulman et al. 2009). Miers et al. (2007) and Wright and Lindqvist (2008) also illuminated the value of online learning to, in part, facilitate learning across different sites as well as provide a scenario-based context for learning. Success, however, is reliant on the development of real interactive case scenarios linked to practice settings, and facilitators and students' knowledge and skills levels around learning technologies (Miers et al. 2007, Pulman et al. 2009). This reinforces the importance of training for facilitators and preparation for students in order to maximise the potential of e-learning as scaffolding, leading to the social construction of meaning (ibid.).

Thinking point

Some interprofessional education e-learning resources to explore:
Interprofessional and Inter-agency Collaboration (IPIAC), Social Care Institute for Excellence: http://www.scie.org.uk/publications/elearning/ipiac/index.asp
E-Learning Support for Inter-Professional Education in Health and Social Care (ELSIE):
http://www.health.heacademy.ac.uk/projects/jiscdel/del1_rlo
Centre for Inter-Professional e-Learning (CIPEL): http://www.cipel.ac.uk/

In social constructivism, completing interprofessional education tasks enables students to go beyond their 'actual developmental level' and into the ZPD (Jarvis et al. 2003). This allows students to increase their existing knowledge base and accommodate new knowledge (Hean et al. 2009b) in a learning environment that encourages students to develop reflective skills and attitudes that contribute to effective problem-solving and critical skills (Maddux et al. 1997). As students develop a comprehensive understanding and become independent learners, these scaffolding systems are no longer needed and can be slowly removed (Vygotsky 1978, Jarvis et al. 2003, Hean et al. 2009b). Vygotsky's concept of ZPD is utilised by D'Eon (2005) who provided an account of student-centred learning tasks with 'scaffolding' support to facilitate the transfer of learning. He explained how such tasks become progressively more complex; for example, moving from simple case observations in realistic or authentic settings involving two disciplines through to very complex cases in realistic or authentic settings involving more than four disciplines. This enables students to transfer their learning to new and different situations, building on successes and enhancing their prior knowledge.

Suggested further reading

Clark P. 2006. What would a theory of interprofessional education look like? Some suggestions for developing a theoretical framework for teamwork training 1. J Interprof Care 20(6):577–589.
Craddock D, O'Halloran C, Borthwick A, Mcpherson K. 2006. Interprofessional education in health and social care: Fashion or informed practice. Learn Health Soc Care 5(4):220–242.
Hean S, Craddock D, O'Halloran C. 2009b. Learning theories and interprofessional education: A user's guide. Learn Teach Health Soc Care Pract 8(4):250–262.
Hughes M, Ventura S, Dando M. 2004. On-line interprofessional learning: Introducing constructivism through enquiry-based learning and peer review. J Interprof Care 18:263–268.

Understanding the challenges of teaching and learning interprofessionally through a theoretical lens

As you can read, the interprofessional education event in our case study has been partially successful. Despite best efforts things still go wrong, even if theoretically sound. Nothing can prepare you for the complexity of interprofessional education as some of the facilitators recognised: it is a matter of continuing to learn in a different way for everyone involved. Poor student evaluations and a lack of enthusiasm by facilitators mean that our interprofessional lead is struggling to know what to do next.

Our contention is that explanation and understanding of practical problems in education can often be found by looking at what went wrong from a theoretical perspective. In other words, rather than simply addressing each criticism or problem in a reactive way, it is better to search for the reasons why the students felt aggrieved and the facilitators struggled. Our lead decides to take this approach as she feels that it might also be the way to encourage the facilitators to work with her in the future.

Her first task is to convince the Interprofessional Education Curriculum Planning Committee that using theory to guide the response to the students' criticisms and facilitators' potential withdrawal is the way forward. She is aware that some members will just want to change the delivery mode, perhaps to make it an on-line module; others will blame the problems on differences in the students' experiences of the workplace and suggest a different mix within each learning group. She knows from listening to colleagues who lead interprofessional education in other universities that making these changes may be necessary but they may not be sufficient to provide future students with a good enough experience of learning and staff facilitating interprofessional education with the support they need.

Our lead sets aside a morning to search for theories to help her understand why not all the students and facilitators enjoyed learning or facilitating interprofessionally. She is aware that 'barriers to IPE will not disappear by simply being ignored, but they can be managed and overcome' (McPherson et al. 2001, p. 46). Her plan is to write a short paper and a list of discussion points for the Interprofessional Education Curriculum Planning Committee to inform their collective decision about revisions to the interprofessional modules for delivery the following year. Her search leads her to literature about the creation of professional knowledge, the concept of professionalism and onto Bernstein's theory about how knowledge is classified and the role of power in pedagogic practices.

The task is not an easy one. The paper must appeal to colleagues who have been quite vocal in the past about how they are practical people, understanding theory is for academics. Her aim is that the development of the modules should be related to the theory and perhaps this will encourage more theory informed education initiatives across the faculty.

Professionalism and the organisation of knowledge: what can theory tell us?

In the Western world, the professions first gained, and now maintain their roles and status, *via* the specialist knowledge that underpins the services they offer. The ascendancy of professional knowledge marked a transition from societies in which any query about received knowledge was seen as a challenge to 'moral orthodoxy and a threat to the all important social cohesion' (Macdonald 1995, p. 158). Possession of their own knowledge and thus the ability to do their work confers a social value on members of a given profession. This permits them, and only them, to respond to market demands for their work. In return, society permits self-regulation and other key features commonly accepted as constitutive of a profession. These include the right to independent thought and, in the UK and USA, minimal (though some would say increasing) state control of professional practices.

One barrier to interprofessional learning is the tradition of separate professional education. The history of non-medical healthcare sciences professional education has often been one of the gaining independence from the medical profession by limiting medical control over curricula, examinations and professional registration. Professional education, however, is not just a process of gaining professional knowledge and skills: it is a process of socialisation into the values and characteristics of a particular profession.

Modern society has increasingly demanded a variety of services so that now no one profession can meet demands in traditionally defined fields of practice, e.g. law and medicine. One reason for this is the exponential growth of knowledge in the nineteenth to twenty-first centuries, creating the need for, and some might say allowing, different professions to create their own collection of *knowledges* and of practitioner know-how or competences. This industry of knowledge and skill management demands from each profession a pedagogical system of reproduction and production.

Thinking point

Compare the above discussion on the monopoly each profession has over a particular knowledge set, with the discussion earlier on social capital and the external resources held within the network that can only be accessed by other members of the interprofessional team through social interaction. Both these approaches are essentially talking about the same thing, although articulating this in two different ways. You may find one or other of these approaches assist your understanding of interprofessional education in your context.

In universities, knowledge reproduction and production is translated as teaching others what professional practitioners know and undertaking research for new knowledge. Most usually, both these types of work (teaching and research) are carried out in distinct departments staffed by academic members of a single profession. These reflect the distinctive roles in the work setting of each profession not only in healthcare but also in other agencies that have responsibilities for the health and well-being of individuals and the community. Beattie's (1995) discussion of tribal boundaries in healthcare highlights how this socio-anthropological concept helps our understanding of how and why 'domains of knowledge' (p. 15) are kept apart. He draws upon Bernstein's (1971) distinction between curriculum types naming them as either collection code or integrated code.

Code in this instance denotes the way in which meaning is realised in a particular context, in other words how we come to understand something, or to know it. For a full explanation, see Bernstein (1996, p. 111). Beattie asserts that the collection code, where knowledge is accumulative and new knowledge is built on past knowledge, dominates health science professions curriculum typologies. He argues for curricula based on the integration code, i.e. curricula that encourage learning from other disciplines, accepting that it is possible to understand something in more than one way or from more than one perspective. In this way, the curricula (in places) have enhanced relevance and flexibility and are more able to permit the redrawing of knowledge boundaries between the professions. This redrawing of knowledge is what is sought during interprofessional learning. In other words, after learning about each other and from each other, the separate professional *knowledges* about a particular patient/client or practice issue are bought together in a *learning with* from diverse expertise and experiences. The ultimate aim of this is effective collaborative practice since, as McPherson et al. (2001, p. 46) remind us, 'whether or not the caregivers see themselves as part of a team, each patient depends on the performance of the whole'. This need to work collaboratively or, put another way, to be an interprofessional practitioner, presents learners with the challenge of integrating some of their knowledge with that of colleagues from another profession.

This approach is not to advocate the merger of different professional curricula, or 'to remove differences or blur boundaries between what a nurse and doctor might do, or how an occupational therapist and psychologist might approach management. Rather, we need to clarify and understand the different ways of thinking and combine the different knowledge and skills in a way that will benefit patients (McPherson et al. 2001, p. 48).

Curricula need to foster interprofessional learning of knowledge that needs to be shared between certain teams of healthcare practitioners (and those from other agencies) in addition to promoting uniprofessional learning essential for each professional practice. It is arguable whether the experience of *learning with* is in itself sufficient for capability as an interprofessional practitioner. But programmes of learning that focus on integrating topics around a client group, accessible by learners from appropriate professions, form a foundation for interprofessional practice for newly qualified practitioners. Similarly, continued professional development and service delivery improvement initiatives are usefully modelled on this concept. The learning together from the integrated code then leads (in theory) to working better together: supporting the transition from practice that simply acknowledges the role of others to ways of working that embrace and celebrate the different perspectives (or knowledges) of all members of the team bring to the world of meeting the needs of a particular service user.

With the proliferation of professions, and ignoring only for lack of space the distinctions made between all those occupations that now enjoy such a title – see Freidson (1994) for a full discussion of this – effective and efficient public services (e.g. healthcare, social care and well-being services) now depend on practitioners from a range of professions. Importantly and increasingly most commentators agree that effectiveness also depends upon the capability of these practitioners to collaborate in service delivery. They also agree that one key attribute of effective collaborative working is the willingness of staff from different professions to share their specialist knowledge with others and to recognise and respect the knowledge of staff from other professions.

Post-registration and continuing professional development programmes with integrated code curricula in interprofessional education are not always well received. Despite government policy drivers and committed efforts by senior managers (e.g. the Dean in our case study), professionally labelled initial undergraduate programmes find interprofessional education difficult as the case study shows. Insights into these dilemmas are explored next by first looking at another of Bernstein's curriculum classification systems and then briefly returning to the role of professional socialisation.

Hammick (1998) argues that we can better understand the challenges of learning to be interprofessional by drawing on Bernstein's model of the categorisation of knowledge. In this model, there are collections of specialist knowledge known as singulars (e.g. anatomy), and those known as regions. Regions are several singulars bought together and as a result look towards a field of practice (e.g. physiotherapy). Hammick (1998) argues that interprofessional knowledge arises from the transition of several regions into a 'new terrain of knowledge' (p. 326). This can happen in a team of practitioners from different professions and when students from different professions collaborate in an enquiry-based learning: it is essentially what happens during the experience of *learning with*. As previously argued, the creation of a terrain of knowledge is much more likely to happen where the curriculum model follows the integrated code rather than the collection code, encouraging learners to draw widely on different types of knowledge rather than (just) collecting knowledge from the heritage of their own profession.

Ideally, interprofessional education is organised, so that students are encouraged and enabled to learn with those from different professions and, consequently, to effectively form new terrains of knowledge alongside the conceptual frameworks of their professions' knowledge. Moving regions of knowledge into the new terrains challenges the moral orthodoxy and threatens the social cohesion of each profession. Learning and working interprofessionally means

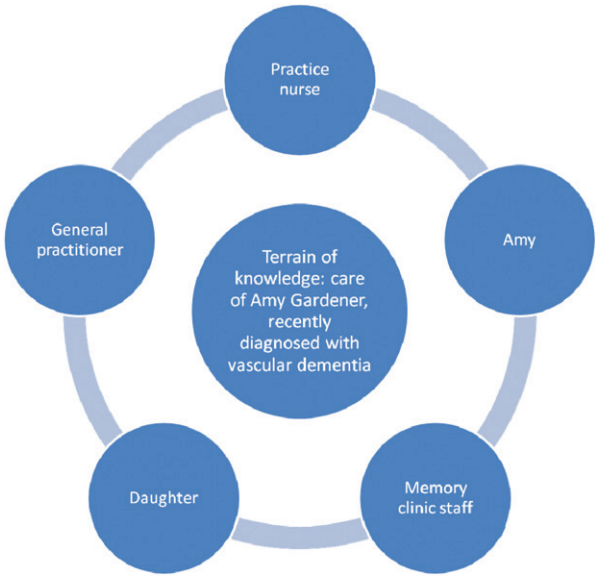

Figure 2. An example of the creation of a terrain of care formed through the overlap of five regions of knowledge.

acknowledging the need for less thinking in our own regions of knowledge and more learning from the collaboratively created terrains of knowledge that must also include what the user of services knows.

So, for example, in the care of an older person (Amy) with dementia, several regions of knowledge are required to ensure effective and efficient patient and family care. The need is for a terrain of professional and personal knowledge, possibly specific to a particular patient and their family, built from the different professional and personal knowledge regions involved in that person's care. In order to do this, the learner (or the practitioner) needs to understand their own profession's knowledge region, to understand how their region fits in with the knowledge regions of others, and to value and respect the contribution all the regions make to the new terrain. Figure 2 shows this for one person recently diagnosed with dementia. In this Venn diagram, each practitioner or person's individual region of knowledge remains: the terrain is made from a part of those regions shown as a snapshot at one point in time. We suggest that the terrain will change shape as the chronology of caring for Amy proceeds. Other practitioners and different agencies may become involved in Amy's care; other members of her family (and friends) will be involved – each new collaborative team will contribute to and need to recognise these changes.

The theories discussed above show that considerable change is at the heart of an interprofessional education curriculum. The process of learning to be a particular practitioner and of being socialised into a particular profession will inevitably be altered with the introduction of a more integrated curriculum delivered to learners from two or more professions that seek to create new terrains of knowledge and enables learners to form interprofessional social groups. Introducing educational change brings the responsibility to use theory to help students and staff better understand the complexity of the new curriculum and their reactions to this new way of learning.

Putting theory into practice

The paper our interprofessional lead has written for her colleagues discusses some theories which can help to explain why well-planned interprofessional education modules may not be well received by all the students and staff involved. It has drawn on some complex ideas that help in understanding why even well-intentioned and well-planned interprofessional education needs on-going scrutiny to permit its acceptance by all those involved. We selected theories for their utility in helping staff gain a deeper understanding of the challenges that interprofessional education makes to professional identity and theories with the ability to shed light on how interprofessional education is working at the micro-level (students learning to be interprofessional) and the macro-level (staff organising and assisting the facilitation of interprofessional education). These theories are demanding; we think they are appropriate when explanation of why well-planned interprofessional education modules do not go according to plan is needed. In other words, they are timely theories to use *post hoc*. This may not, of course be the only time they are useful; it is worth considering their utility in your particular interprofessional education context.

We contend that an essential element of the process of becoming an interprofessional practitioner and facilitator includes learning how knowledge is produced and reproduced in *your* profession and how this leads to views of the world of practice through a particular professional lens. It is vital to recognise powerful influence of primary professional socialisation on individuals who are then required, or indeed personally decide, to work with others interprofessionally. Working in this way demands a willingness to learn about others (possibly of minimal difficulty) also from others (probably a greater challenge) and finally with each other to produce a new terrain of knowledge. It is this that is the most demanding; requiring acceptance that the gap in what we know can only be filled by collaborating with others to create that terrain.

Putting into practice what we learn from theories of professional socialisation and the ways professional knowledge is created is another matter. Our argument is that collaborative learning and working demand some mediation of professional socialisation, some *give and take* when it comes to whose knowledge and values are important and acknowledgment of the importance of sharing knowledge to achieve effective collaboration and care. To achieve this, the concept of *give and take* in this context needs to be discussed openly during interprofessional learning by staff and students. Issues that may arise in such discussions include who takes lead responsibility in a particular team, sharing of documentation and matters relating to data protection and how different models of care can best be used to fully understand the patient/clients needs. These, and other areas of potential conflict amongst the diverse staffing groups delivering public services, need to be seen within a context where power

Comment Box 3. Using ALT models to develop an interprofessional education curriculum.

Our interprofessional education lead at the University of Hope has done her homework by reading up and digesting the basics behind ALT. In doing so, she has identified two recent models of interprofessional education to illustrate how theory can be effectively used to inform curriculum development. The models chosen were the Seamless Care Model (Mann et al. 2009) and the University of British Columbia Model (Charles et al. 2010). For each interprofessional education model, she summarised the benefits of the theoretical frameworks used; associated factors that curriculum developers needed to consider; the instructional approaches used; and how they were implemented in each institution. The results of this exercise are presented as Tables 4 and 5. These examples illuminate the utility of theory in guiding curriculum development processes, aiming to provide students with a positive interprofessional learning experience that responds to stakeholders' evaluations.

Our interprofessional education lead believes that by using learning and teaching methods based on educational theories and derived principles, University of Hope educators will become better interprofessional education facilitators. She believes that this will improve students' knowledge, skills and attitudes towards interprofessional Education, resulting in better skilled practitioners who are capable of working collaboratively to provide patient-centred care and improved outcomes.

Comment Box 4. For discussion at the interprofessional education curriculum development committee's away day.

Our interprofessional education academic lead plans her away day and prepares some points for discussion, exploring some of her experiences of resistance to interprofessional education and through a sociological lens.

If professional education plays a role in socialising students, socialisation into the values and characteristics of a particular profession, how can we best organise and enable our students to develop interprofessional values and characteristics; so, students learn both how to be a practitioner in their chosen profession and how to work interprofessionally?

We need to create the right circumstances for students in interprofessional learning groups to willingly share their own professional knowledge with students from other professions. How do factors such as control and power come into this and how can facilitators enable the necessary knowledge sharing?

Staff can feel very vulnerable when asked a question they do not know the answer to and this is likely to happen when facilitating interprofessional learning groups. What would resolve these issues?

Thinking back to our discussions about social capital and how not knowing about what other's know may inhibit knowledge transfer, what is the optimal way to organise interprofessional education so students can translate each other's knowledge where necessary and from there create new and shared knowledge?

differentials are still determined by tradition and complex hierarchies exist within agencies and organisations.

Being able to *give up* a particular professional view of the patient/clients situation and *take in* the professional knowledge of others is at the heart of working interprofessionally. As Hammick et al. (2009) point out that this requires (amongst other qualities) having respect for our colleagues and confidence in what they know, a self-confidence about what we know and what we do not know, being willing to engage with others and to share knowledge as the way towards the best possible outcome for patient/client. Discussions about how to achieve interprofessional socialisation needs to be facilitated in ways that allow everyone's views to be heard; including what the potential negative consequences are thought to be. The discussion points for the case study away day in Comment Box 4 suggest some areas worth exploring in more detail.

Suggested further reading

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Conclusions and reflections

Using theory to inform and shape interprofessional education

We have illustrated in this Guide, through our case study, that theory is a strong tool to be utilised by educators to articulate and develop our practice in the development and delivery of an interprofessional education curriculum.

The use of social capital can help to defend the need for an interprofessional curriculum and provided guidance as to what the learning groups could look like and how they and the activities within it could be structured. It also helps us think about the sustainability of the trust students have of other practitioners on entering practice and potential power differentials within the learning groups. Many of the propositions created by our mythical interprofessional education committee need to be tested through empirically sound research into the dimensions and dynamic nature of the social capital generated in an interprofessional student learning group. For example, by testing some of the propositions, we discuss in Comment Boxes 1 and 3.

Many health and social care educationists may be more familiar with ALTs. Our choices here of cognitive and social constructivist theories are particularly useful with some excellent examples of their application available in the literature. Even with an interprofessional curriculum that is theoretically sound, its introduction and delivery within traditional professional programmes may still be contested. We have shown that an understanding of the socio-political dimensions of interprofessional education can help curriculum developers and delivers work through the challenges that working interprofessionally across departments of professional education can bring. We have to continually develop staff to enable then to reflect on and explore their own discomfort with participating in interprofessional learning.

Table 4. Seamless care model (Mann et al. 2009).

Component of theoretical framework (Mann et al. 2009)	List of benefits in components of the theoretical framework	Factors that need to be considered in each component of the theoretical framework	Instructional approaches used in this overall theoretical framework	Implementation of each instructional approach used in this overall theoretical framework
Social cognitive theory	– Provides learning opportunities through ongoing dynamic reciprocal interactions of individuals, their behaviour and the environment. – Guides the development of interprofessional educational interventions to include consideration of factors affecting the learning context, teaching and factors contributing to the learners' perceptions and experience. – Enables observation to inform curriculum development decisions *via* the use of role modelling and demonstrations. – Enables students, facilitators and service users to build self-efficacy through practice.	– The need to incorporate role models to demonstrate collaborative practices by the facilitators and in the locations selected for the students' experiences. – The need to develop interprofessional educational tasks that allow students, facilitators and patients to build self-efficacy through practice.	(1) Active learning and experience in solving authentic problems (2) Small-group collaborative practice experience and problem-solving (3) Problem-based learning	(1) Inclusion of service user groups with healthcare needs that require a collaborative interprofessional approach to their management and active service user participation to achieve desired outcomes. (2) Active involvement of learners in the framing of problems experienced by these service users and in working with them to develop and implement approaches to their solution. (3) Formation of small interprofessional student practice groups to facilitate collaborate learning experiences, involving all group members. Solving real problems experienced by service users affords experiential learning opportunities, developing students' knowledge, skills and perceptions of self-efficacy. (4) Presentation of a problem in the clinical setting by a real service user, generating a process of self-directed learning and its application to the problem.
Situated learning	– Facilitates learning through apprenticeship and active participation in the practices of a community of professionals. – Enables learners to be regarded as legitimate participants of the community, working from the periphery of the community towards the centre with increasing responsibility and involvement. – Facilitates learning *via* guided participation in the practices of the community, through which identity and meaning are developed.	– The need to provide learning opportunities that enable students to participate legitimately in existing communities of practice where collaborative models of practice had been established. – The need to provide support to enable students to establish their own community of practice conducive to developing knowledge and skills to provide interprofessional collaborative patient care.	(4) Opportunities for reflection and integration of learning (5) Cooperative learning	(5) Inclusion of opportunities for students to reflect on personal experiences, the content and process of their team's work and the outcomes achieved *via* seminars and discussions. (6) Embodying key skills such as interdependence, face-to-face interaction, collective decision-making, individual accountability, interpersonal and small group skills, in the individual and group processes involved in the assessment and development of a collaborative patient management plan.
Constructivist learning theory	– Enables learners to construct their own personal knowledge and representation of the world, *via* building on past knowledge and experience to incorporate new knowledge. – Encourages learners to actively participate in learning. – Enables students to be provided with an authentic experience in a rich environment. – Offers students the opportunity to reflect and integrate learning.	The need to arrange the placement of student groups in collaborative settings, to promote an interprofessional understanding of service users' care and their respective roles.		

Table 5. University of British Colombia Model of Interprofessional Education (Charles et al. 2010).

Component of theoretical framework (Charles et al. 2010)	List of benefits in components of the theoretical framework	Factors that need to be considered in each component of the theoretical framework	Instructional approaches used in each stage of this overall theoretical framework	Implementation
Transformational learning	– Takes into account the development of self, involving interaction with others. – Offers an opportunity to free people from the biases acquired during earlier learning experiences by engaging in learning opportunities that challenge their world view. – Encourages students to critically reflect, through discussions with others, to comprehend their own and others' world views.	– The need to recognise that students' learning experiences need to incorporate time and opportunity to comprehend current ways of collaborative working with others; and change behaviours. – The need to develop learning opportunities that encourage students to be critically reflective and participate in dialogue, in order to challenge existing attitudes and beliefs about their own profession and that of others. – The need to link the timing of the interprofessional education experience to students' readiness to learn, taking into account the belief that change is incremental coupled with an apparent connection between a deep level of understanding and level of education.	*Exposure stage*. Junior level students participate in parallel learning experiences with peers from other professions *via*: (1) interprofessional conference; (2) social activities. (3) Health Care Team Challenge (HCTC) event, held before a large audience of peers, faculty and community practitioners, where two Teams of students are challenged to produce a collaborative case management plan within a specified time. (4) Student participation in a health outreach clinic, working in partnership with people with challenging healthcare needs and learning about other professions.	(1) Organising an interprofessional conference exposing students to peers from other disciplines and introducing them to the concept of interprofessional practice. (2) Encouraging the student body to organise interprofessional social activities promoting collaboration and interaction. (3) Inviting students, staff and community practitioners to attend a HCTC event. Create two interprofessional student teams challenged to work on a case that has been provided by Faculty, and develop a collaborative management plan within an agreed time in response to a number of pre-determined questions put forward to them by a moderator. At the end of the event, arrange for both teams to be given feedback by community practitioners, and encourage all students observing the HCTC to reflect on their observations to inform their appreciation of interprofessional practice. (4) Arranging for students to attend a health outreach clinic to work primarily under the supervision of clinical educators from their own profession. During this time, students are also exposed to the view of other professions *via* training sessions, team meetings and joint activities with the patient group.
Developmental theory	– Provides opportunities to keep our sense of self or to change, appreciating that interactions occur within our own personal history and sense of self, interpersonal interactions, and the cultural and social context in which we operate. – Recognises that the environment in which students are trained and the people with whom they interact can significantly influence their professional development. – Offers students through the systematic exposure to other professions, an opportunity to learn that there are other ways of seeing the world. – Broadens students' perspectives,	– The need to provide learning experiences that enable students to be challenged on an intrapersonal, interpersonal and interprofessional community basis within the broader learning environment. – The need to incorporate opportunities for students to interact with members from other professions during the course of their programme.	*Immersion stage*. Senior level students with more in-depth knowledge of their professions *via*: (1) Campus and practice placement experiences, enabling students to learn collaboratively with peers from other professions. (2) Students are offered opportunities for 'self-reflection' needed to transform their current perspectives on themselves, their professions and others.	Developing interprofessional learning opportunities, learning from (1) UBC's Interprofessional Rural Programme of British Columbia; and (2) the accredited Interprofessional Health and Human Service Courses. (1) Establishing a partnership programme between Universities, health authorities and other external stakeholders to facilitate the development of learning opportunities where students can practice interprofessional collaboration in rural interprofessional education community placements. Allocate interprofessional groups of between four and seven students to these placements where students can practice interprofessionally and meet profession-specific objectives. Supervised by an educator from their own profession

(*continued*)

Table 5. Continued.

Component of theoretical framework (Charles et al. 2010)	List of benefits in components of the theoretical framework	Factors that need to be considered in each component of the theoretical framework	Instructional approaches used in each stage of this overall theoretical framework	Implementation
	minimising communication issues and misunderstandings that may occur between health professions.			students receive feedback on their collaborative and team-working skills from a range of professions. (2) Develop accredited modules, taught by a team representing different professions, that enable students to participate in campus- and practice-based learning opportunities. Provide students with opportunities to communicate with their peers, reflecting on interprofessional practice with people from a specified group.
			Mastery. Advanced level learning opportunities appropriate for graduate students with considerable experience. (1–3) The instructional approach used encourages advanced critical thinking skills, a high degree of self-reflection and an in-depth appreciation of the contribution of one's own and other professions in health and social care.	(1) Developing a certificate in Practice Education. The programme at UBC aims to develop practice educators capable of supervising students from their own and other professions. It utilises on-line learning experiences, requiring experiences in the practice setting and building on existing interprofessional skills in the focused role of an educator. (2) Providing graduate students with an opportunity to build on existing skills in interprofessional practice by enrolling on an interprofessional project. Such a programme at UBC is entitled the Interprofessional Psychosocial Oncology Distance Education Project (IPODE), involving students from a range of professions. These students, working in small web-based learning teams, are given education opportunities to improve their ability to provide interprofessional, collaborative patient-centred care in psychosocial oncology practice. (3) Awarding an annual prize to a practice team, demonstrating excellence in interprofessional teamwork and service delivery leading to improved patient care. The team has to be composed of at least three health disciplines and at UBC the prize is awarded at the HCTC, celebrating interprofessional practitioners.

Evaluation that is theory led is essential to assess changes like we identified in the case study as is basing further improvements on the evidence this produces. Identifying the nature of the terrains of knowledge created by the student's work and using these as examples to help future students and staff understand the nature of interprofessional learning is key to the continuing success of interprofessional education developments.

The case study has illustrated the effort that goes into the design and delivery of an interprofessional education curriculum and the need for considerable preparation and support for staff involved. It has shown that planning and delivering interprofessional education with theoretical sophistication is an intellectually challenging and time consuming exercise. It is, however, as essential a part of sound interprofessional curriculum design as team management, political skills and insightful leadership.

We wish you all the very best in your interprofessional education practice and welcome comments on your experience of the application of theory to practice.

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Notes

1. This seminar series aimed to develop an overview of theories introduced into the Interprofessional Education field, and to compare, contrast and apply these to interprofessional education and research to improve the quality of research and practice. A description and key outcomes of this seminar series can be accessed at http://eprints.bournemouth.ac.uk/11965/1/FINAL_REPORT_RES-451-26-0360.pdf

2. HPC (2010) has recently consulted on proposed changes to the generic standards of proficiency. The Centre for Advancement in Interprofessional Education responded to this advocating most strongly the inclusion of explicit reference to collaboration with other professions for effective patient care and safe practice (CAIPE 2010).

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Appendix

Table A.1. Pedagogical approaches and application in interprofessional education.

Pedagogical approach	Further reading	Application in interprofessional education
Problem-based learning	An educational approach that aims to develop analytical and critical thought, cooperative and self-directed learning and the integration of knowledge and skills within the context of practice and self-motivation (Biley & Smith 1999, Newble 2002)	(Goosey & Barr 2002, Reynolds 2003, Hoffman & Harnish 2007)
Practice-based learning	The clinical integration of teaching to improve students' knowledge, skills, attitudes and behaviour (Coomarasamy and Khan 2004); and in interprofessional education, promote future team-working by focusing on the quality of care for patients (Reeves & Freeth 2002, Guest et al. 2002)	(Guest et al. 2002, Reeves & Freeth 2002, Wakefield et al. 2006, Morison & Jenkins 2007, Young et al. 2007)
Guided discovery learning (GDL)	GDL refers to a context and framework for student learning through the provision of learning outcomes (Spencer & Jordan 1999). Here, the principle of what is to be learnt is not given, but rather the learners have responsibility for exploration of content and achieve understanding through self-directed study (Boydell 1976, Spencer & Jordon 1999).	(O'Halloran et al. 2006)
Experiential learning	Experiential learning, *via* for example the use of simulated ward environments, is a conflict-filled process, out of which comes the development of insight, understanding and skill (Kolb 1984).	(Ker et al. 2003, Issenberg & Scalese 2007, Swan et al. 2008, Dillon et al. 2009)
Reflective practice	The theory of reflective practice, attributed to Schon (1987), is a post-modern educational theory, emphasising relationships between knowledge and experience. It has been identified as a fundamental student centred and pedagogical approach used in all interprofessional education initiatives (Miller et al. 2006), and is considered to be an essential skill as a means of continuous change and learning (Schon 1987, Holme 1998).	(Campion-Smith & Wilcock 2000, Miller et al. 2006)