



University of Brighton



— ***Research Matters*** —

Articles from the Pedagogic Research Conference 2017

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Articles from the Pedagogic Research Conference 2017

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University of Brighton

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Research Matters: introduction to articles from the University of Brighton annual Pedagogic Research Conference, 2017

DR RACHEL MASIKA AND DR ADRIAN CHOWN
CENTRE FOR LEARNING AND TEACHING

Abstract

This article introduces papers developed from six presentations at the University of Brighton's annual pedagogic research conference held in 2017. The broad aims of pedagogic research are highlighted and the key foci of the pedagogic research focussed conference are presented. Noting that pedagogic research employs a diverse of approaches and adopts a broad range of theoretical and conceptual lenses, the paper then provides a brief synopsis of the articles that follow.

Pedagogic research explores the experience of students and staff in higher education, with the aim of:

- enhancing knowledge of the relations between the curriculum, learning, teaching and assessment
- supporting improvements in decision-making, planning and practice in higher education
- contributing to the development of educational theory (Haig, Cotton and Hall, 2015; Baume and Beaty, 2006)

With these intentions in mind, this publication presents six papers from the University of Brighton's annual Pedagogic Research Conference held in February 2017.

The University has a strategic commitment to the development of pedagogic research and research-informed teaching. As part of this strategy, the annual conference aims to provide a friendly, informal environment in which colleagues from the University and its partner colleges discuss pedagogic research matters and share their experiences. Generally, conference presentations refer to work-in-progress related to one of the following broad themes:

- improving participation, retention and progression
- enhancing teaching, learning, assessment or achievement at all levels of higher education
- curriculum development
- transition into and trajectories through higher education

- relations between higher education and learning in other settings, including work and the community
- the 'student experience'
- research methodology
- digital practices.

Original investigations of student and staff experience ask very varied questions (Norton, 2009); employ diverse approaches and methods of enquiry (Tight, 2013; Trahar, 2013; Canning and Gallagher-Brett, 2010), and adopt a broad range of theoretical and conceptual lenses (Yorke, 2003). The range of conference papers presented here relate to a number of the conference themes and demonstrate this diversity.

In her Introductory talk at the conference, **Professor Rhona Sharpe** discussed researching digital literacy within an institutional context, and emphasised the particular value of local research that examines students' experience of technology. In the first paper, which is based on her talk, Rhona argues that technological innovation and institutional investment in resources must be informed by an understanding of how students behave in an increasingly rich 'digital environment' and specifically how they use digital technology to help them learn. This will enable institutions to exploit resources efficiently and provide the support required by students to use them effectively. In developing this argument, Rhona draws on her experience at Oxford Brookes University. She describes how rigorous local research helped the university community to create an institutional definition of digital literacy; design technology-enhanced learning at university and programme level, and evaluate the extent to which it had been embedded into the curriculum.

In the second paper **Dr Hannah Frith** and **Gabby Barker** explore the theme of inclusive practice in relation to their experience of supervising or supporting undergraduate students with disabilities. Undergraduate dissertations, highly valued for rigorously testing students' academic and intellectual skills whilst emphasising student autonomy, are often regarded as a 'capstone' assessment: the culmination of undergraduate study. Working independently alongside a supervisor is a defining feature of this mode of study. However, the experience of undergraduate dissertation supervision is surprisingly under-researched in comparison with doctoral supervision. The growing diversity of the higher education student body and increasing emphasis on inclusive education, prompted the researchers to reflect on undergraduate supervisory practices and provided the context for the investigation. Eleven supervisors in one UK university Social Sciences department completed an in-depth, online qualitative questionnaire that explored how they actually 'do' supervision, what they consider to be good practice, and their experiences of supervising students with disabilities. Thematic analysis of the data revealed three key themes: 1) an ideal model of an engaged student/supervisor relationship, 2) the challenge of disengagement, and 3) recognising the uniqueness of every student. Individually tailoring supervision to meet students' needs was recognised as good practice, and supervisors saw disengagement as disrupting supervision for students with and without disabilities. The paper includes discussion of what supervisors and students can do to improve the effectiveness of undergraduate supervision.

Sarah Leach and **Dr Hazel Horobin** begin the third paper by noting that simulation-based education (SBE) has been used to successfully deliver components of healthcare teach-

ing within medicine, but is much less common in physiotherapy. Following its introduction to the University of Brighton MSc Rehabilitation Science, their study was designed to explore the perceived influence of respiratory SBE on physiotherapy students' experience of critical-care placements, and the implications for pedagogic practice. A qualitative investigation was undertaken, involving five participants recruited from the 2015 cohort and selected to provide a broad range of experience. Individual semi-structured interviews were recorded and Mezirow's (1993) transformative learning theory (TLT) was used as an interpretive lens to analyse the data. The paper suggests TLT provides an appropriate model for the design of effective simulation in healthcare education. When scenarios are designed with attention to past experiences as well as learning outcomes, they enable participants to become familiar with the environment in which critical care services operate and create opportunities to explore clinical relationships. Devised in this manner, SBE helps students to recognise that the development of skills involves feelings as well as thoughts, and enhances their ability to enact new skills in their clinical work.

The TLT model encourages students and lecturers to understand that feelings of anxiety or stress are an integral part of learning and this is applicable to all learning experiences, not just SBE. In work-related programmes of study, the recognition and management of emotions forms an important, and perhaps neglected, aspect of the skills required for employment. Rather than avoiding stress, strategies for acknowledging and managing it are relevant dimensions of teaching and learning, particularly as preparation for stressful work environments such as those in healthcare.

Problem-based learning (PBL) is a popular pedagogical approach and methodology for curriculum design, especially in higher education for the professions. In the fourth paper, **Dr Nicola Dearnley and Dr Wesley Scott Smith** present research into how case-based learning scenarios influenced the development of students' diagnostic reasoning on a course for Physician Associates (PAs) at Brighton and Sussex Medical School (BSMS). PAs complete a two-year postgraduate course, but are expected to graduate with diagnostic skills equivalent to those of newly-qualified doctors who have completed a five-year course. BSMS has utilised PBL in an attempt to accelerate the acquisition of these skills by PAs. Weekly PBL sessions were conducted during Year 1 of the course, focusing on the 'top 20' core medical conditions within the curriculum. Alongside this, students had weekly clinical exposure in General Practice. To assess the impact of this strategy the Diagnostic Thinking Inventory (DTI) developed by Bordage et al. (1990) was conducted three times during Year 1 and the results were compared to standardised data for medical students and doctors. This assessment found that PA students had a significantly higher baseline score in terms of *flexibility of thinking* (equivalent to newly qualified doctors engaged in foundation training) and *structure of memory* (equivalent to third year medical students). Results showed a statistically significant improvement in structure of memory across Year 1: achieving an improvement in score which took over four years to achieve in medical students. This appears to suggest that PBL can facilitate increased assimilation of diagnostic reasoning skills within postgraduate learners. The research also seems to indicate that the postgraduates entering the PA course already possessed well-developed general reasoning skills, and were able to rapidly employ those skills in diagnostic reasoning at a standard equal to or better than undergraduate medical students.

This paper includes detailed discussion of how professionals think and make decisions. It will therefore be of interest to all those whose work involves helping students to develop their reasoning skills.

In her paper, **Jacky Brewer** reports initial findings from research conducted as part of 'The Scholarship Project'. This three-year, nationwide initiative involves 46 colleges of higher and further education and is designed to create a framework for college higher education (CHE) called The Scholarship Framework. Using Boyer's (1990) scholarship of 'teaching, integration and application' as its theoretical underpinning, The Scholarship Project brings together teachers, students and employers to develop a framework of scholarly activity that will improve teaching and learning by transforming, transmitting and extending knowledge, while also enhancing peer support and mentoring. Initial reconnaissance work involved a survey of all 46 partner colleges to identify and measure employee engagement (EE) and test whether that engagement was scholarly. Drawing on this initial survey, four colleges designed and implemented a trial EE scheme. Jacky's paper discusses the findings of the trial, which are mapped against Boyer's Models of Scholarship and demonstrate that the engagement had a scholarly profile. The implications of introducing similar schemes in diverse institutions are also considered.

Relationships between language and learning are the theme of the final paper, in which **Rachael Carden** and **Marion Curdy**, suggest that there may be an increased learning leap required of non-native English speakers. Two factors appear to have a particular influence on the learning of accounting subjects by students on the International Business degree in the Brighton Business School. The first is '*linguistic confusion*'. Some students have English as their first language (E1L) while for others it is an additional language (EAL). Observation of first-year Financial and Management Accounting classes suggests that EAL students may have to make a greater 'learning leap' (Cousins, 2009) than their E1L peers because they misunderstand the lexis of accounting and finance. Particular problems are caused by '*false friends*' (terms which appear similar in other languages but actually have other meanings in English) and *cognates* (terms which have the same spelling and meaning in other languages). The second factor is '*conceptual confusion*'. This occurs because students have experienced a variety of mathematical pedagogies in their previous educational institutions. This paper is based on a research project that investigated the uses of peer learning through an online discussion board to address these issues and enhance learner inclusion.

The papers included here refer to diverse disciplines, themes, theoretical perspectives and methods of investigation. Nonetheless, they share a common determination to better understand the experience of higher education students and the staff who work with them. Four papers illustrate how small-scale pedagogical enquiries, conducted by practitioners investigating their own work or that of their colleagues, can achieve this aim. The two other papers show the value of enquiry that examines individual experience within a broader institutional context. Taken together, the six papers demonstrate how investigation can improve our understanding of pedagogic practice, broadly conceived, and how the insights it generates can help us to enhance learning, teaching and the curriculum. Publishing the papers provides a means of sharing the insights they offer and we are confident that those who read them will find many of these insights applicable to their own work. But we also hope that reading the papers will motivate col-

leagues to undertake pedagogic research themselves, with the aim of enhancing their practice and presenting their work at future conferences.

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Biographies

Dr Rachel Masika is a Senior Research Fellow at the Centre for Learning and Teaching, University of Brighton. She co-convenes the annual 'Enhancing higher education through research' conference at the University of Brighton, which focuses on pedagogic research. Her research interests include the enhancement of higher education learning and teaching policy and practice through analyses drawing on social critical theories. Her current research examines transitions of rural students into and through higher education in South Africa.

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Researching digital literacy within an institutional context: the contribution of learner experience research

PROFESSOR RHONA SHARPE, UNIVERSITY OF SURREY
(PREVIOUSLY OF OXFORD BROOKES UNIVERSITY)

Abstract

This paper will explore the role that local research can play in understanding learners' experiences of technology. In the last 15 years there has been an explosion of research into how learners are using technologies to support their studies and this remains an active and important research area. From large-scale survey studies to collective inquiries to capture learners' voices, we know all sorts of things about learners that we didn't know before. Why then do we still need local research into digital learning?

With a focus on the development of digital literacy, this paper will reflect on the role that institutional research has played at Oxford Brookes University to create our definition of digital literacy, and evaluate the extent to which it has been embedded into the curriculum. Along the way we will reflect on the role of research in shaping technology enhanced learning at the programme and institutional level.

Introduction

Although there is little agreement in the academic literature over how the term 'Technology enhanced learning' is being used (Kirkwood and Price, 2013), in practice, higher education institutions (HEIs) are now deeply engaged in conversations about how to use technologies to enhance learning. Reports from sector bodies attempt to provide evidence about what works to improve the student experience (Davies et al., 2017) or identify future trends in educational technology (Becker et al., 2017). A rationale often given for this activity is to meet changing student expectations and it does seem to be the case that students are generally positive about the use of digital technologies in both further and higher education (Newman and Beetham, 2017).

However, student expectations should not be equated with student use, and certainly not with effective use. Learners in both further and higher education are frequently presented in sector reports as a homogenous group of 'tech' savvy learners who are confident, positive and motivated about the use of technology (Pavlakou and Sharpe, 2014). This idea is not supported by research, which shows that most current use of technology by students is superficial and presentational, and that learners would like to be shown how to make more use of technology (Gosper et al., 2013).

In this paper, I argue that we need to understand technological innovation from the perspective of how learners respond to the technology rich, world they find themselves in, and specifically how people develop to be effective learners within these environ-

ments (Sharpe and Beetham, 2010; Sharpe, 2014). Investment in resources needs to be complemented by support, underpinned by research, to help students make good use of these environments.

For the last 10 years or so, I've been involved in a number of projects to evaluate students' experiences of learning with technology in both further and higher education funded by JISC, Higher Education Academy and the Education and Training Foundation. In this keynote, I talked briefly about some of the things we have learned from learner experience research and about how this has been applied at Oxford Brookes University: from defining digital literacy to embedding it within the curriculum and monitoring the impact on the student experience. The aim is to convince you of the value and role of learner experience research in underpinning technology innovation in education.

Learner experience research

Learner experience research takes account of the wider context in which educational uses of technology are taking place. It uses naturalistic and participatory approaches to uncover 'the place and role of technology in students' lives' (Sharpe and Benfield, 2017, p. 198). It is about seeing the use of technology from the learner's viewpoint, and understanding its use in context. Rather than asking students to share their views on the use of a specific technology within a module or course, we might ask them to talk about which technologies they use and in what ways. Such a holistic approach significantly moved forward our understanding of learners' technology use as 'blended, mobile and social' (Sharpe and Benfield, 2014).

For example, learner experience research has been valuable in helping us understand difference in a more meaningful way. Here's an example from a recent project in further education. Davies (2010) conducted interviews with 16-19 year old learners in their own homes and created a continuum, which described their technology use from unconnected and vulnerable learners through mainstream pragmatists to intensive and specialist enthusiasts. Using this continuum as a framework for analysing data from focus groups with students in further education, we found that different priorities dominate the experience of students depending on where they are on the continuum (Sharpe and Brown, 2015; Figure 1, opposite).

Unconnected and vulnerable learners are challenged by personal or family circumstances from having access to and ownership of technology. This means that even when provided with technology, they lack opportunities and resources for study, for participation in the online world of their peers and for developing technology skills. For these learners their experience of education is predominantly access-led.

By contrast, intensive and specialist enthusiasts present themselves as highly engaged, adaptable and collaborative learners of technological processes and behaviours. They mobilise their personal literacies practices between the contexts of home, college and work (Bhatt, 2012) as their personal interests influence their areas of study and employment (Davies, 2010). For these students, their experiences are dominated by the extent to which they are able to appropriate social and personal uses of technology for learning purposes.

For the majority of learners, the mainstream pragmatists, they regularly use technology for a range of purposes, and accumulate and share a range of technology practices.

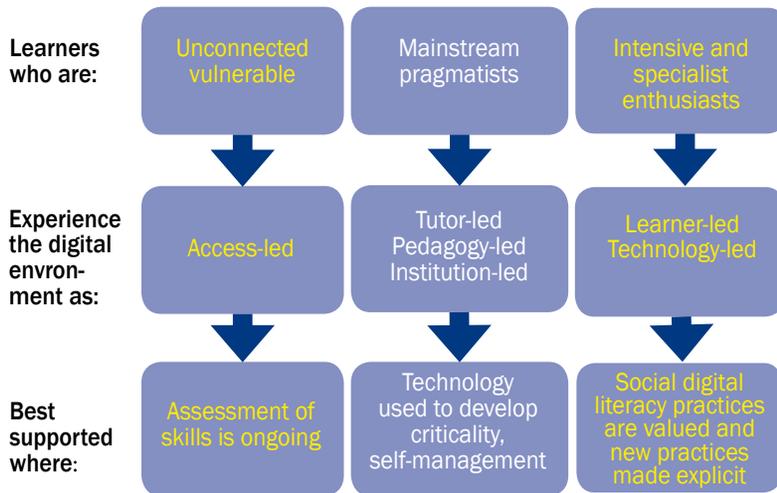


Figure 1: Learners’ experience of technology in further education (Sharpe and Brown, 2015, adapted from Davies 2010)

They may be ambivalent or even resistant to using technology, and largely regard technologies as instrumental in achieving their goals. We described this group as being tutor-led, where their experiences are dominated by issues of pedagogy (Sharpe and Brown, 2015). Their use of technology is influenced by the activities designed by their tutors and the environments provided by their institutions. Learners in the focus groups were keen to tell us not to assume they are digitally literate, that they needed ongoing development and that they wanted to work with staff on developing their digital skills.

It is clear then that teachers and the courses they design, need to take account of the different challenges learners have, and that in doing so, they can have a significant role to play in developing the habits and strategies that students need to learn effectively in the digital age.

Attributes of successful learners and teachers for a digital age

Another important output from learner experience research has been the ‘Developing Learners for a Digital Age’ model (Sharpe and Beetham, 2010). The original idea was that effective learning built upon access, skills and practices. These practices enabled the development of attributes of effective learners in a digital age (Figure 2, over). There has been some puzzle about what goes at the top of the triangle. An ethnographic meta-analysis of qualitative literature identified the attributes of successful learners as connected, confident, adaptable and intentional (Sharpe, 2014).

This model has also been applied to staff development (Bennett, 2014). Drawing on interviews with higher education teachers who identified as technology innovators, Bennett noted that those who displayed the attributes at the top of the triangle were pro-

Developing the practices and attributes of successful learners for a digital age

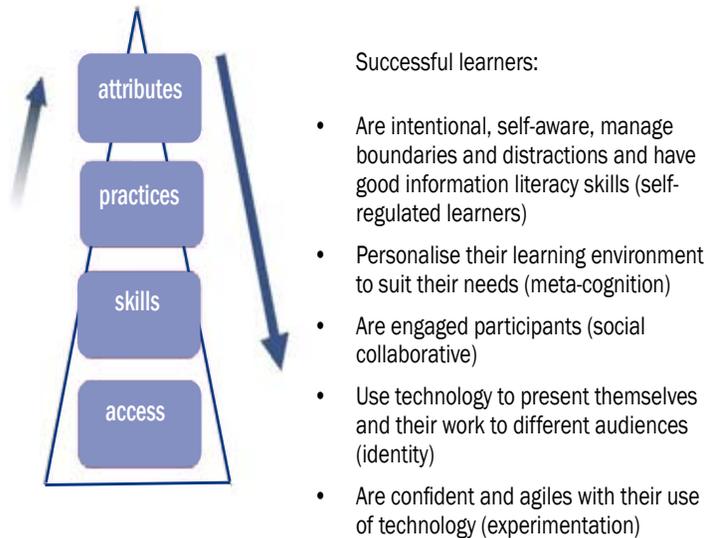


Figure 2: A model for developing learners for a digital age (Sharpe and Beetham, 2010 adapted by Bennett 2014)

active in arranging and negotiating access to technology and were motivated to develop the skills and practices they needed. The arrows Bennet added to the model to show direction of travel are a helpful enhancement.

At Oxford Brookes University, we took our responsibility to prepare learners for a digital age seriously. The Strategy for Enhancing the Student Experience (2010) defined digital literacy using this developmental framework as 'The functional access, skills and practices necessary to become a confident, agile adopter of a range of technologies for personal, academic and professional use' (Oxford Brookes University, 2010). This notion of the agile adopter arose from work conducted by Jane Seale and colleagues who highlighted the digital agility of disabled learners, characterised by being extremely familiar with technology, using a wide range of strategies and having high levels of confidence in their own ability to use technology (Seale, Draffan and Wald, 2010).

The early learner experience research showed that learners' experiences are highly contextualised, and this is part of the reason that we use the word 'literacy' to emphasise socially and culturally situated practices (Sharpe, Beetham and de Freitas, 2010). Other universities have similarly adopted digital literacy as an aspiration for students, often expressed as a graduate attribute, for example, 'the confident and critical use of information and digital technologies to enhance academic, personal and professional development' (Leeds Beckett University, undated) and includes social practices such as 'how our learners create and manage their own digital, networked identities for their personal and professional development' (Bradford University, 2016).

Embedding digital literacy into the curriculum

The Oxford Brookes University Strategy stated that 'every undergraduate programme will include the development of five graduate attributes' (Oxford Brookes University, 2010) and this led to several years of intensive work to audit and map the development of graduate attributes, including digital literacy, and where necessary to revise curricula and its supporting documentation to make them explicit. There was a focus on rewriting programme level learning outcomes to bring the graduate attributes alive for students, employers and professional bodies, which allowed programme teams to contextualise generic definitions within their discipline.

An interim evaluation, analysing 90 revised programme specification documents, highlighted and shared examples of how graduate attributes had been interpreted within the disciplines (Sharpe et al., 2013). The evaluation concluded that the disciplinary differences between how graduate attributes are expressed, are in explaining *the ways and contexts in which elements of the attributes are put to use*. For example:

- Make effective and confident use of relevant and appropriate technologies to enhance learning, communication and problem solving. Communicate effectively online and work with others using collaborative tools. (International Business Management).
- Demonstrate a confident familiarity with a broad range of information technology skills in order to communicate effectively using graphical techniques, reports and presentations within a commercial and technical environment. (Automotive Engineering, Motorsport Engineering, Mechanical Engineering).
- Effective use of digital technology to present analysis and solutions to a variety of audiences. (Statistics).

The longer term success of the project to embed digital literacy into the curriculum has been to develop new subscales for the Brookes Survey of Student Engagement. Using the ways in which the graduate attributes had been defined in programme documentation as a starting point, items were devised using stems characteristic of student engagement surveys. These were refined and tested using cognitive interviewing techniques which uses think aloud and verbal prompts to understand how students are interpreting the questions (after Kandiko and Matos, 2014). This resulted in questions about three types of engagement: emphasis of coursework on mental activity, frequency of use; and contribution to skills and personal development.

The Oxford Brookes Survey of Student Engagement was distributed to non-final year students in 2014 and 2016, with response rates of 11 per cent and 13 per cent respectively. In 2014, the responses to the digital literacy questions were noticeably lower than to those around the other graduate attributes. This contributed to the creation of a university wide Technology Enhanced Learning Steering Group, and the results had improved by 2016 (Table 1, over). The survey will be distributed again in spring 2018.

Responses to digital literacy items	Percentage responding 'very much' or 'quite a bit' or 'very often' or 'often'	
	2014	2016
Critically evaluated digital sources of information	56	65
Used technology to collaborate with others or engage with online communities, for example, Wikis, online forums, discussion boards, social media.	49	50
Used technology to reflect on and record your learning? E.g. blogs, for example, e-portfolios, mind maps, learning diaries	27	39
Used technology in innovative or creative ways	50	66

Table 1: Responses to digital literacy items on Oxford Brookes Survey of Student Engagement

Conclusions

Learner experience research has underpinned the development and evaluation of digital literacy at Oxford Brookes University. From the first steps to define digital literacy as a graduate attribute, learner experience research informed our understanding of digital literacy as a set of socially and culturally situated practices. Practices are not easily separable from subject knowledge and skills, and therefore need to be embedded into the curriculum. The method chosen to embed digital literacy into all courses was based on the belief that the design of courses and activities is the primary influence on students' digital literacies. Contextualising digital literacy within the discipline empowers teachers to take responsibility for developing digital literacies. Finally, the development of new subscales for the student engagement survey provides local data of how students experience these newly designed curriculum, which continues to inform decision making and can be a powerful tool for change.

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Biography

Professor Rhona Sharpe is Head of the Department of Technology Enhanced Learning at University of Surrey. Rhona has been researching learners' experiences of technology for more than 15 years in both further and higher education. She is interested in the processes by which we design online learning spaces and the digital literacies and attributes that learners need in order to learn well in them. She is chair of ELESIG (www.elesig.net): a special interest group for learner experience researchers. Rhona's interests in designing for learning and learner experience are well represented in two co-edited books *Rethinking pedagogy for the digital age* (2013) and *Rethinking learning for the digital age* (2010). Her latest book, *53 Interesting Ways to Support Online Learning* (2016), uses learner experience research to underpin practical ideas for teachers to use with their students.

Towards inclusive supervision for undergraduate dissertations

DR HANNAH FRITH AND GABBY BARKER, SCHOOL OF APPLIED SOCIAL SCIENCES

Abstract

Undergraduate dissertations, highly valued for rigorously testing students' academic and intellectual skills whilst emphasising student autonomy, are often regarded as a capstone assessment. Working independently alongside a supervisor is a defining feature of this experience, yet research on the experience and process of undergraduate dissertation supervision is surprisingly scarce. The growing diversity of the student body, and increasing emphasis on inclusive education, prompts reflection on supervisory practices. Eleven supervisors in one UK university social sciences department completed an in-depth online qualitative questionnaire exploring how tutors actually 'do' supervision, what they consider to be good practice, and their experiences of supervising students with disabilities. Thematic analysis of the data revealed three key themes: 1) an ideal model of an engaged student/supervisor relationship, 2) the challenge of disengagement and 3) recognising the uniqueness of every student. Individually tailoring supervision to meet students' needs was recognised as good practice, and supervisors saw disengagement as disrupting supervision for students with and without disabilities. Recommendations for practice arising out of this are discussed.

Keywords: supervision, undergraduate, inclusivity, dissertation

Background

Students with disabilities form a growing proportion of the UK higher education student population. Statistics from the Higher Education Statistics Agency (HESA, 2016) for 2014-15 show that 11.5 per cent of first year undergraduate UK domiciled higher education students were known to have a disability; however, as students are not obliged to report their disability, this figure may be an underestimate.¹ Of these, most declared a 'Specific learning disability' (46 per cent) or 'Mental health condition' (15 per cent), with just less than 10 per cent declaring a 'Longstanding illness or health condition'. As disabled students' access to education continues to improve, attention has increasingly turned to addressing students' *participation* in curricula. The Disability Discrimination Act (2005) requires universities to be *proactive* in their provision for disabled students,

¹ This figure was calculated from numbers presented on Table 14: 'First year UK domiciled higher education students by level of study, sex, mode of study and disability 2014-15', which is available on the HESA website: <https://www.hesa.ac.uk/data-and-analysis>. Calculations have been rounded to the nearest 0.5 per cent.

while the recent contraction of the Disabled Student Allowance (DSA) has put pressure on institutions to be more *inclusive* in their provision, ensuring that disabled people are able to participate fully in education.

Inclusive education represents a shift away from supporting specific student groups through discrete policies, reasonable adjustments or specific interventions, towards embedding equality within access and participation in all functions of the institution. The guiding principle is that what is good practice for disabled students is good practice for all students. According to May and Bridger (2010), this kind of 'sustainable and effective inclusive cultural change' is possible only when institutions focus simultaneously on both institutional and individual factors, and on 'cultural and systemic change at both the policy and practice levels' (p. 2). At a practice level, rather than focusing on integration, where ad hoc arrangements to teaching and assessment are made to enable the student to fit in with pre-existing arrangements, teaching practices should be accessible by design. This means removing barriers which might prevent students from engaging fully in and being successful on courses, and adopting a flexible approach to teaching, learning and assessment which embraces difference. This focus on practice highlights individual-level change involving attitudes, awareness, knowledge, understanding, perceptions and assumptions (May and Bridger, 2010), and recognises that the active involvement of academic staff is essential to developing and sustaining inclusive practice (Adams and Brown, 2006). This study aims to identify good practice in undergraduate dissertation supervision through a review of the existing literature on dissertation supervision and on inclusive practice, and by exploring what supervisors consider to be good practice. By exploring supervisors' experiences and understanding of supervising undergraduate dissertation students, including students with disabilities, this project focuses on inclusive education at the level of practice (rather than institutional policy) and at the individual-level of academic staff.

Undergraduate dissertation supervision

Research on undergraduate supervision is rare (Rowley and Slack, 2004; Shadforth and Harvey, 2004), especially in comparison to postgraduate research supervision. Yet, the dissertation typically forms a substantial part of the assessment of undergraduate programmes, featuring significantly in the calculation of the overall degree classification (Hand and Clewes, 2000), and offers a unique opportunity for students to demonstrate autonomy, independence and mastery of their subject (Rowley, 2000; Todd, Bannister and Clegg, 2004). Although the dissertation varies across disciplines and institutions (Webster, Pepper and Jenkins, 2000), some key characteristics are shared: the learner determines the focus and direction of the work; carries out the work on an individual basis; has a prolonged critical engagement with the chosen subject producing an extended piece of writing; and, there is a substantial research component requiring data collection and/or analysis (Todd et al., 2004). To this, we would add that students are expected to work with a supervisor in developing their knowledge and completing the project, and as such this represents a distinctive form of teaching and learning in the undergraduate experience.

The dissertation represents an atypical learning experience in undergraduate education due to both the complexity of the task and the typical model of one-to-one supervision. While valuing the dissertation as a form of learning and assessment, learners

often find producing a specific research question, setting an appropriate scope for the dissertation, gathering the data and managing their time challenging (Todd et al., 2004). The experience of students with disabilities is largely overlooked in this literature, yet there are good reasons to think that these challenges may be particularly acute for some students. For example, students with dyslexia who experience problems with sequencing and information overload may find it difficult to organise material and to order their argument (Craig and Zinkiewisc, 2010).

Research suggests that students and supervisors typically share expectations of the supervisory role (Armstrong and Shankler, 1983; Stafani et al., 1997; Todd et al., 2004; Todd, Smith and Bannister, 2006), which can be summarised as: providing support in identifying and defining the research question; ensuring that the project is feasible in scope and ethically sound; advising on appropriate methodologies; and helping with project planning and meeting deadlines (Todd et al., 2006). Central to the process is helping students to navigate the inevitable shifts between dialectical moments of 'cosmos' (moments of insight and order) and 'chaos' (unsettling experiences of intellectual confusion, cf. Silén, 2003) which characterise attempts to master key ideas, concepts or theories. This uncertainty typifies the experience of both students (Todd et al., 2004) and supervisors (Todd et al., 2006).

In addition, the supervisor-supervisee relationship has been conceptualised as a collaborative partnership, which has significant intellectual and counselling dimensions (Todd et al., 2004; Derounian, 2011). This relationship brings unique challenges: the student and supervisor may be relative strangers before they work together (Derounian, 2011), there is an unequal power relationship between them (Shadforth and Harvey, 2004), each may have differing personalities, attitudes and values (Pathirage et al., 2006), and supervisors may adopt differing supervisory styles, ranging from formal to informal (Todd et al., 2006). Supervisors are often acutely aware of the need to balance the pastoral and intellectual aspects of the role by being encouraging, nurturing and supportive whilst avoiding being too directive and structured, or being responsive to students' needs while fostering independence (Derounian, 2011; Todd et al., 2006), while students may interpret calls for greater autonomy as being 'cast adrift' (Shadforth and Harvey, 2004). Literature on postgraduate supervision may have limited applicability to undergraduate dissertations since supervisors often have diverse projects and students to manage simultaneously, have limited time to become familiar with the student's learning styles and needs, and yet have to develop targeted supervision to help the student negotiate complex learning activities (Rowley and Stack, 2004). Despite the challenges encompassed in the supervisory relationship, little consideration has been given to whether these may be more acute for students with disabilities. Yet, we might expect that students who have difficulties with social communication (for example, some students on the Autistic Spectrum or some students with heightened levels of anxiety) may find developing a strong supervisory relationship especially challenging.

Research exploring the student experience of undergraduate dissertations in the social sciences has rarely considered the issue of 'inclusive supervision' or the supervision of students with disabilities. By exploring supervisors' experience of supervising undergraduate dissertations, including their experience of supervising students with disabilities, this research aims to contribute to our understanding of this complex process and to work towards developing inclusive supervisory practice.

The study context

A social sciences department in a post-1992 university was the setting for the research. A 40 credit Dissertation Module, which is mandatory for all social science students, runs across both semesters of the final year and contributes 33 per cent to the final year grade. Students must produce an 8-10,000 word dissertation based on either empirical data collection/analysis or a critical literature review. A lecture programme addresses issues common to completing a dissertation (the relationship of the research question to the literature, ethics, project management etc.), and students are offered eight hours of face-to-face supervision time (usually individual tutorials). In addition, supervisors answer questions via email, provide feedback on two drafts of a section of the dissertation (up to 2,000 words), and provide feedback on an ethics application or outline proposal. A Dissertation Handbook provides practical information about ethics, deadlines, presenting the dissertation and includes a section on 'How to get the most from supervision'. Like many social science courses, students are offered a free choice of dissertation topic (within the practical and ethical limitations that they face), and supervisors are allocated (rather than chosen) on the basis of this and their proposed methodology.

The department has a larger proportion of students with a declared disability in comparison with the university as a whole (18.2 per cent compared to 13.3 per cent), with 277 students declaring a disability in 2014-15. Students with disabilities may have a Learning Support Plan (LSP) developed in dialogue with central student support services, which outlines any specific adjustments to teaching, learning and assessment which are recommended. In 2014-15, there were 195 active LSPs for students in the department, which represented a substantial increase on the previous year (165 in 2013-14). Reflecting national trends, learning difficulties (such as dyslexia) represent the majority of these students (64.5 per cent), while students with mental health difficulties (such as anxiety or depression) represent a substantial and fast-growing minority (15.9 per cent). While LSPs go some way towards supporting these students, as the literature on inclusive practice makes clear, it is important that we pay attention to practice and individual-level understanding of inclusivity.

Eleven supervisors completed an in-depth online qualitative questionnaire exploring how they conduct supervision, what they consider to be good practice, and their experiences of supervising students with disabilities. This was a small scale, exploratory piece of work designed to capture views about the process of supervision from academic staff. Data from staff working with students with disabilities, and students (with and without disabilities) has been generated as part of a larger study and are reported elsewhere. The majority of supervisors were aged between 35 and 45, (64 per cent), female (73 per cent), all identified as 'White', and had been supervising undergraduate dissertations for between 2 - 20+ years. The resulting data was analysed using thematic analysis (Braun and Clarke, 2006) which is used to identify patterns and commonalities across the accounts provided by participants about the process of supervision.

Results and discussion

Supervisors' responses revealed three key themes: 1) an ideal model of an engaged student/supervisor relationship, 2) the challenge of disengagement, and 3) recognising the uniqueness of every student. Underpinning these themes was a tension between

supporting and guiding the student to achieve to the best of their ability versus encouraging autonomy and independence.

1) An ideal model of an engaged student/supervisor relationship

Underpinning the accounts from supervisors was an ideal 'model' of the student/supervisor relationship. This model represented a high level of student engagement where students would 'Engage with it over the whole process' [Supervisor 1 [S1]]. Student engagement has been defined as 'participation in educationally effective practices, both inside and outside the classroom, which leads to a range of measurable outcomes' (Kuh et al., 2007), or as 'the quality of effort students themselves devote to educationally purposeful activities' (Hu and Kuh, 2001, p 3). Others have defined engagement as 'the process whereby institutions and sector bodies make deliberate attempts to involve and empower students in the process of shaping the learning experience' (HEFCE, 2008). Therefore, engagement can be considered a two-way process. The 'ideal' supervisory relationship rests on high levels of student engagement, but also sees facilitating and encouraging this engagement as a key part of the supervisor's role. Fredrick, Blumenfeld and Paris (2004, pp. 62-63) describe three dimensions of student engagement: behavioural, emotional and cognitive. We draw on this taxonomy to describe the representation of the ideal supervisory relationship.

Behavioural engagement is when students adopt the behavioural norms of the institution (such as attendance and involvement) with the absence of disruptive or negative behaviour. The supervisor's model of good practice was based on students engaging in appropriate activities and behaviours which are seen as essential to both the process of supervision (attending supervision meetings, taking notes, drawing up agendas, preparing for meetings, keeping in contact, reporting on progress, etc.), and of completing a dissertation (developing research questions, reviewing the literature, study design, etc.). Directing face-to-face meetings and maintaining regular email contact were seen as key behavioural signs that students are developing professional skills and becoming independent and autonomous learners. When asked 'what students could do to make the process of supervision smoother', supervisors typically focused on behaviours: 'Actually providing meeting agendas and meeting notes' [S9] or 'Keep in regular email contact. Attend supervision meetings. Come to meetings prepared, with relevant papers to hand, and make their own notes' [S4]. Supervisors appear to have clear expectations about how students 'should' behave in order for supervision to be an effective process, which was also seen as a kind of 'professional training' [S9] for life beyond university.

Emotional engagement refers to students' affective connection to, interest in or enjoyment of the project. As is typical in social sciences, students have an open choice of research topic (constrained by pragmatic/ethical considerations), and are encouraged to pursue a research question which fires their intellectual curiosity. This freedom is highly regarded in module evaluations, mirroring the existing research on student experience (Stefani et al., 1997; Todd et al., 2004). When describing what makes supervision enjoyable, one supervisor said: 'It is enjoyable when they chose an area they are genuinely interested in and have a passion for. The key to enjoying it is seeing them feel proud of their work' [S5]. Although student motivation is typically high, supervisors saw part of their role as encouraging 'the student to be engaged with, and challenged by, and excited about their topic' [S4]. As one supervisor put it: 'The purpose of supervision is to

encourage and where necessary, ignite enthusiasm for finding out about, engaging with, disturbing, raging against and celebrating the world and its possibilities [S6].

Expectations of emotional engagement were also apparent in the importance supervisors placed on students 'taking responsibility' for their dissertation by demonstrating a level of independent thinking, managing the process of supervision, and directing the process of the dissertation. Students should 'not expect the supervisor to provide them with definitive answers (but instead respond to questions and suggestions to pursue their own ideas)' [S4]. When students 'own the process' the supervisory relationship is one in which staff guide and facilitate rather than being expected 'to 'fix' problems' [S7]. Supporting students to 'take ownership' over the project (as well as the process of supervision), by helping students to develop confidence in their own abilities, was seen as an essential part of supervision:

The most important part of supervision in my opinion though, is to empower the student to make their own decisions. As such, I am sure to explain that whatever I suggest is only advice, and that ultimately the student must decide how best to proceed. [S10].

Ideally then, students would not only engage in behaviours considered to be educationally effective, but also embody a confident, decisive, autonomous emotional engagement with the project by 'taking ownership' and adopting a collaborative supervisory relationship.

Cognitive engagement refers to the investment students have in their learning, and their desire to push themselves intellectually. While supervisors made few explicit references to cognitive engagement, the undergraduate dissertation is widely regarded and valued as a challenging piece of work by staff and students (Todd et al., 2004; Greenbank and Penketh, 2009). Supervisors saw their role as both developing students' capacity to engage intellectually with the topic and to produce a written report of this, which would meet the requirements of the assessment. The role of the supervisor is to 'remind them of the requirements of the assessment (and recognise the limitations imposed by time and resources)' [S4], and to 'facilitate the undertaking of an achievable and relevant research topic and the ways in which they use their sources to formulate an answer' [S5]. Or, as one supervisor put it:

My role is to explain the process of writing a dissertation and how best to use the time allowed. We speak about the structure of document, the criteria and learning outcomes (LOs), the necessity of signposting, deadlines for chapters/ethics proposals, creating a plan for the weeks/months ahead, the importance of answerable research questions/aims and how a dissertation differs from other types of assessment. [S10].

Supervisors supported the development of students' intellectual engagement by providing 'critical and constructive feedback on draft work' [S7], by 'being a critical reader' [S9], or by helping students to 'review their work critically' [S4]. This kind of critical interrogation of the work is valued by supervisors and students alike (Stefani et al., 1997; Todd et al., 2004; 2009). To this end, supervisors saw part of their role as being to 'suggest possible theoretical and empirical work they could consult' [S4], 'to suggest reading and research avenues' [S2] and to 'suggest theory and sources where appropriate' [S5]. Supervisors expect intellectual engagement and see their roles as to foster this engagement.

In sum, supervisors often have an ideal model for supervision which includes a high level of cognitive, behavioural and emotional engagement from students which moves them towards the ideal of being autonomous, self-motivated, critical and independent learners, able to produce an independent piece of social scientific research. We can characterise the work of supervisors as engaging students: behaviourally, emotionally and cognitively in the process of completing a piece of dissertation research, and in the process of working with a supervisor.

2) The challenge of disengagement

If a high level of engagement was the ideal model for dissertation supervision, it is perhaps not surprising that forms of disengagement, especially behavioural disengagement, was an area of concern (and frustration) for supervisors. Supervisors placed particular importance on face-to-face meetings, and 'keeping in touch':

I try to persuade them to see me fairly regularly to discuss progress. Far from all students follow this advice, and my impression is that it is a diminishing number. [S1].

The challenge of supervising students often related to the issue of engagement, especially in terms of engaging in face-to-face meetings or keeping open a channel of communication: 'Students not coming to see me until the very last minute' [S3], or students who 'seem to be starting later than they should often miss planned meetings' [S5]. Behavioural disengagement: failing to contact, or respond to the supervisor, was a key area of concern for supervisors, and most discussed attempting to re-engage, students who lost contact:

If I have not heard from students and there are key milestones to be met I will email them. [S8].

As one supervisor notes 'I do everything I can to avoid the student going AWOL'. [S10]. There is a tension here, recognised by supervisors, between the ideal self-managed student who engages appropriately with supervision and the task of completing the dissertation, and the student who needs more support or direction from the supervisor.

While disengagement was recognised as a problem across the student body, this featured specifically when exploring the challenges of working with students with disabilities. Students with mental health difficulties sometimes experience time management or organisational problems leading to disengagement, from the dissertation, from supervision, or both:

Two students who 'vanished' told me that they had anxiety issues [...] The nature of the dissertation (heavily weighted, relying on self-motivation, very important, big bang) is an especially difficult situation for anxious people. [S8].

Absences, missed meetings or missed deadlines were sometimes interpreted as a 'red flag' indicating a more serious problem. This is important given that students may not disclose a mental health difficulty, and that such difficulties may arise (or become more acute) during the course of the students' time at university. In addition, some supervisors recognised that the demands of the project and/or supervision can interact with mental health issues to make disengagement or re-engagement acutely challenging:

The student has been reluctant to come to meetings even with gentle encouragement. I think students with anxiety can really struggle as they become very worried when they feel they are falling behind and are reluctant to ask for help. [S4].

Disengagement, then, closes down negotiation and leaves supervisors unsure of the cause, and unsure whether to push attempts to re-engage students or whether this will increase the burden on students.

3) Recognition: the uniqueness of every student

Although supervisors' responses indicated that they held an 'ideal' model of supervision predicated on high student engagement, this sits alongside a recognition that all students have different skills and abilities, different needs and wants from supervision, and diverse projects which make different demands upon them. Supervisors expect to tailor their supervision to the unique requirements of the student and to the project. Dissertation supervision is therefore, a very complex task which requires open communication and negotiation between the student and supervisor about how to work together and the exact nature of the task before them. The first supervision meeting is typically characterised as a place to both draw out student motivations, passions and interests and shape this into a do-able project. One supervisor described this as an 'explorative conversation':

From that conversation, I try to tap into the student's interests in their topic and where that comes from. Later in the conversation I try and tease this out into a research plan or what it is the student will actually do. At this point I ask the student to pull their chair over and I pin down what it is we have said in a bullet point email, which I send to them at the end of the tutorial. [S6].

Supervisors constructed supervision as a dialogic process where learning takes place in dialogue between the supervisor and the student (as in the example above). Open and productive dialogue was seen as central to the process of learning in the dissertation. Supervision was constructed as providing 'a sounding board to discuss their reading, research and ideas' [S1], and a place where ideas can be discussed, debated and explored:

I would like them to see knowledge as something that they are in dialogue with, and have power over, acknowledging the partiality of all understandings. I think that the supervisory relationship is where those discussions are held, and the project is where the student comes to discover these things for themselves. [S9].

Supervisors worked to ensure that this dialogue was not 'authoritative' but one in which students actively participated, as a means to find their voice and 'take ownership'. The first supervision meeting, was also identified as an important space for negotiating how the supervision would operate.²

2 The questionnaire specifically asked about whether supervisors negotiate with students about the kind of support they need and/or whether they discuss their approach to supervision, but this focus on negotiation and dialogue was picked up in response to a number of other questions.

In the first meetings [...] I made suggestions on ways of working such as: keeping in regular contact, responding to emails, being frank about problems with their work, being prepared for meetings, taking notes of our discussions, meeting deadlines etc. I did not present these as specific expectations, but rather what I thought would work well and help them in their dissertation [S4].

Supervisors use first meetings with students to outline their preferred way of working, to make suggestions about effective working practices, and to open up conversations about what students want or need. Supervisors recognise that students work in different ways and try to mould their supervisory practice to meet individual needs. As one supervisor puts it:

As with all aspects of supervision, I will match my approach to the ability/ learning style of the student while always being honest about what is expected if they want to do well [S10].

Similarly, supervisors expected to be able to individually negotiate supervision styles with disabled students since the disability is experienced and managed 'different[ly] with each student' [S1] or 'depends on what's within their LSP [S11]. Supervisory support needs to be individually tailored to the student and how they work with individual negotiation, clear communication and an open dialogue:

I have supervised students with mental health challenges, dyslexia and chronic health conditions. They have taught me a lot about listening, particularly when it comes to learning what specific strategies they have developed and how they know they work for them. They are also usually very clear about what is disruptive to their being able to put those strategies into practice. It's very individual. It requires disclosure and trust in the first instance which creates a more personal dynamic. Trust and mapping your teaching strategy to their needs (rather than vice versa) are key in my view. [S6].

Published guidance about working with disabled students reiterates the importance of asking students about what would be helpful to them and what strategies have worked well in the past, and being flexible to adopt a range of teaching strategies (see, for example, Craig and Zinkiewisc, 2010). But as this supervisor points out, it requires 'disclosure and trust' on the part of the student and self-awareness about what the student finds helpful, and how they work most effectively (which is also the case for non-disabled students). Students are not legally obliged to disclose information about their disability, and may be unwilling to do so because (among other reasons) they fear negative consequences, or believe that disclosure would be of no benefit (Craig and Zinkiewisc, 2010). As one supervisor observed:

They may not want to communicate fully with you for fear that you will be disappointed. The student has said they worry that I do not want to supervise them because of their problems, so I try to reassure them that I do want to work with them. [S9].

Even where students have disclosed a disability at an institutional level (for example as part of the application to university or to central disability support services), information is often limited to issues around assessment (for example, the provision of extra

time, alternative assessments, etc.) and this is not the same as engaging in one-to-one conversations with a supervisor about how to work together.

In sum, supervisors recognised that students have individual and unique ways of working, learning styles, support needs and intellectual capabilities and that the process of supervision needs to be individually tailored for each student. Making this happen relies on an open and reflective dialogue between the student and supervisor.

Recommendations and conclusion

What emerges from this data is a highly complex picture of supervision in which supervisors are working hard to engage students: behaviourally, cognitively and emotionally, in a model of working which they think will most benefit the student. At the same time, supervisors are motivated to individually tailor their supervision to the student and their project. Supervisors attach high importance to dialogue (typically through face-to-face meetings, but also via email and feedback on written work) as a mechanism for learning, and as a mechanism for negotiating this individually tailored supervision. This is encouraging, and indeed would be seen as good teaching practice (for example, Craig and Zinkewisc, 2010). Therefore, we conclude with some recommendations for practice:

- 1) Given the importance of dialogue and negotiation to the supervisory process, finding effective mechanisms to facilitate communication is essential for students both with and without disabilities. Examples include:
 - Demystifying the supervision process, by producing demonstration videos showing different kinds of supervisory sessions (including examples of a first supervision).
 - Providing examples of agendas for supervision meetings (ideally real ones).
 - Videos of students talking about the supervision process: what they found daunting/what they found helpful.
- 2) If learning during supervision is dialogic, how can we help students to capture this learning in diverse ways?
 - Writing summary notes during supervision meeting.
 - Facilitating audio-recording of supervision and/or a summary at the end.
 - Enabling supervision through different communication means (i.e. skype, email).
- 3) Supervisors place an emphasis on students being able to communicate what they want and need from supervision, their learning styles, and what strategies they use to facilitate their learning. While some students may be well placed to provide this kind of information, others may be less aware of, or less able to articulate, their needs. How can we support students to identify and communicate this information in diverse ways?

- A skills audit or self-assessment.
 - A reflective exercise encouraging students to think about their expectations of supervision, supervisors and themselves in supervision.
 - A supervision 'contract'.
- 4) Given the emphasis placed on student engagement, and supervisors' concerns about disengagement, it is important to develop an effective, yet supportive, process for monitoring engagement in order to identify students who are 'at risk' of disengagement, and adopt strategies to help students to re-engage.
- Set clear expectations for students about minimum supervision engagement.
 - Ask supervisors to identify students who are not meeting these expectations.
 - Email these students with details about SSGT support.
 - Module coordinator and SSGTs to liaise about students who fail to respond to this email.
- 5) Some students might struggle to know when it is appropriate to ask for a supervision meeting, for example, students on the Autistic Spectrum may not know how to interpret 'book a meeting when you think you need one'.
- Offer students the chance to book a series of planned regular meetings (the downside is that they may not follow exactly the ebbs and flows of a research project)
 - Help students to identify when they might need a supervision meeting (i.e. identifying key points in the dissertation process) whilst making it clear meetings are not restricted to these times
- 6) Identify alternative forms of assessment for the dissertation which will allow all students to present their best work.

In conclusion, given the unique opportunities offered by the undergraduate dissertation and the heavy assessment weighting that it often carries, it is important to ensure that supervisory practice is inclusive. Although supervisors are often willing to mould their supervisory style to meet students' needs, more may be needed to ensure that students are well equipped to communicate their specific requirements of the supervisory process.

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Exploring the perceived influence of respiratory simulation-based education on physiotherapy student placement experiences

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Abstract

Simulation-based education (SBE) has been used to successfully deliver components of healthcare teaching within medicine, but has been little researched within physiotherapy. This study aimed to explore the perceived influence that respiratory simulation-based education has on student critical care placement experiences, and to consider how this perceived influence may inform future teaching and learning opportunities.

An interpretive qualitative study was undertaken with five participants selected to reflect a broad experience base, recruited from the University of Brighton MSc Rehabilitation Science cohort 2015. Individual semi-structured interviews were recorded and transcribed by the researcher. The interpretive lens of Mezirow's Transformative Learning Theory (TLT) (1993) was applied to analyse the data. This paper concurs with others (Nicholson, 2012; Kleinheksel, 2014), who suggest TLT as a model for the effectiveness of simulation in healthcare education. When scenarios are designed to consider learning outcomes and past experiences, it enables participants to become familiar with the environment of critical care services and permits an exploration of clinical relationships. Through this perspective, SBE can be seen to facilitate the connection between emotion and learning in the cognitive experience of skill development, which assists student transfer to clinical working.

The TLT model recognises anxiety stress as a factor within learning and this can be related to all learning experiences, not just in SBE. In work related programmes, the recognition and management of emotions forms an important, and perhaps neglected, aspect of employability skill development. Rather than avoiding stress, strategies for recognising and managing it are relevant dimensions of teaching and learning, as preparation for stressful work environments such as those in healthcare.

Key words: Simulation-based education, transformative learning, critical care.

Introduction and literature review

Simulation-based education (SBE) has been used to successfully deliver components of healthcare within medicine over the past 40 years within a safe, immersive and complex learning environment (Bradley, 2006). Adoption of this method of learning within physiotherapy education however, has been slower and therefore has limited supportive research (Jones and Sheppard, 2011). Student physiotherapists are entering the challenging environment of critical care (intensive care and high-dependency units) on

placement and therefore, student preparation is crucial to enabling a successful placement experience (Shoemaker, Riemersma and Perkins, 2009). The increasing need for the involvement of physiotherapists in the early mobilisation of patients within critical care settings, presents a growing demand for pre-registration students to be prepared to work and succeed in these challenging clinical environments (Shoemaker et al., 2009).

Without the confidence to perform skills, practical or cognitive, or the ability to display competence, there can be a barrier to success in the critical care setting (Perme and Chandrashekar, 2008). With high levels of anxiety associated with this complex environment, prior learning and experience through SBE may improve learner confidence and reduce anxiety (Mori, Carnahan and Herold, 2015). The use of an appropriate pedagogical approach, such as experiential learning, promotes activities like SBE which can enable high levels of learner engagement; may induce stress, but supports memorable learning experiences (DeMaria Jr and Levine, 2013). Few studies involving SBE for physiotherapy students consider the way in which SBE can promote learning and whether the way SBE supports learning can facilitate a transfer of skills into clinical practice. A systematic review by Boet et al. (2014) looked at transferability of skills in nurses following SBE that indicated that SBE was more effective than didactic education or no intervention. However, it was unclear which skills transferred or which learning theory underpinned the teaching.

Understanding learning theory that underpins SBE is crucial in providing successful opportunities for learning, especially in complex environments such as critical care. One experiential learning theory that can be used with SBE is Mezirow's Transformative Learning Theory (TLT). Mezirow (1993) proposed that true learning occurs when a learner is faced with a crisis or unexpected event, a disorientating dilemma. He outlined three phases of learning; disorientation, critical reflection and future planning. These phases are comprised of ten sub steps of TLT, which are as follows:

Phase one: Disorientation

- 1 Disorienting dilemma: an experience which does not fit in with a learner's pre-existing understanding thereby precipitating confusion

Phase two: Critical reflection

- 2 Self-examination
- 3 Sense of alienation
- 4 Relating discontent to others

Phase three: Planning future courses of action

- 5 Explaining options of new behaviour
- 6 Building confidence in new ways
- 7 Planning a course of action
- 8 Knowledge to implement plans

9 Experimenting with new roles

10 Reintegration.

High-fidelity SBE scenarios have the capacity to deliver unexpected events for learners which provoke a profound sense of uncertainty. Following this period of disorientation, there is a debriefing which incites critical reflection and analysis of the difficulties experienced in the scenario, which provides a platform for learning through a change in assumptions, values and beliefs. Whilst SBE may be viewed as a technological approach to facilitate learning, it requires well-designed simulation scenarios and effective debrief sessions to facilitate the best learning outcomes (Kelly Macauley and DPI, 2016). Mezirow's (1993) theory is rooted in an understanding of individual development, where, precipitated through a crisis in decision making, the learner is forced to enter a negotiation of their own values, understandings and meanings. In this way the learner becomes a more autonomous thinker, but also, and perhaps just as importantly, more aware of the emotional aspects of their working knowledge.

SBE scenarios, with an explicit grounding in learning theory (Kelly Macauley and DPI, 2016), provide an opportunity to explore the impact of this method of education on students entering a critical care placement. Interpretive qualitative research methods were used to explore whether this method of learning influences student participant's perceived ability within a critical care placement.

Aim of the study

'What is the perceived influence of respiratory simulation-based education on physiotherapy student placement experiences?'

This study explored the perceived influence that respiratory SBE had on student critical care placement experiences. Furthermore, it sought to discover how this perceived influence might inform future teaching and learning opportunities.

Research methodology

This interpretive qualitative study used individual semi-structured interviews to collect student participant narratives. Given the subjective epistemology of this work, the design allowed the participants to explain and expand on their notions of their own subjective realities, and allowed the researcher the space to explore and discuss the data. The rich and detailed picture that qualitative data can provide requires rigor and lack of bias to enhance the accuracy and credibility of its findings (Berger, 2015) and this can be enabled through researcher reflexivity.

Analysis through an understanding of Mezirow's TLT steps was applied to transcripts as a means of gaining insight and knowledge from the data gathered (Boyatzis, 1998). Data collection was through face-to-face, individual semi-structured interviews, which enabled a discussion of SBE and critical care experiences. This process offered the flexibility to adjust to changing knowledge during the interview process, facilitating opportunities to contribute to knowledge development (Nicholls, 2009). The project sought to discover whether simulation, underpinned by TLT, bridges the gap between the classroom and clinical placement. It also sought to discover; whether student physiothera-

pists change their practice following SBE, in relation to considering attitudes, beliefs, feelings and behaviours; and whether students perceive that SBE affects their experiences on a critical care respiratory placement.

Methods

Ethics approval was gained from the University of Brighton ethics panel prior to initiation of the study.

Five participants were recruited from the MSc Rehabilitation Science cohort 2015 following an email request, participant information and consent, this number represented all those that responded to the request. Participants were selected to reflect a broad experience base involving different hospitals, types of placement and gender. Participants needed to have attended two respiratory SBE sessions at the University of Brighton in November 2015 and January 2016, as well as completing a six-week placement with daily contact on critical care (intensive care and high-dependency units). Data collection gathered information regarding participant's experience of SBE and student placement in critical care through individual semi-structured interviews that allowed pre-prepared and spontaneous questions to enable participant answers to be explored. Different question types were used based upon Kvale's (Flinders, 1997) categories covering three broad areas: the SBE experience, reflection on learning or thoughts facilitated by the SBE scenario and the critical care placement and reflection on SBE. Periods of silence were part of the interview process to allow the participant time to reflect, and active listening skills (Ryan, Coughlan and Cronin, 2009) were employed. The audio-recorded face-to-face interviews took place at Queenwood Library, University of Brighton and lasted up to one hour. Interviews were transcribed and anonymised by the researcher. The NVivo 11 software package allowed the data from interview transcripts to be organised and stored in one place. Organised data was analysed by the researcher and related to the steps associated with TLT theory.

The researcher was on the same course and institution as the research participants and also took part in the SBE scenarios. Therefore, this study constitutes insider research, which will influence the interpretive process. The researcher endeavoured to maintain reflexivity by entering a process of continual internal dialogue and critical self-evaluation throughout the entire research process (Bolton, 2006). The researcher understood that having a shared experience with research participants provided both advantages and disadvantages. By being cognisant of the effect that the researcher had on the participants; the questions asked during interviews; the data collected and the interpretation of the data would encourage and enhance accuracy and credibility of findings through researcher reflexivity (Berger, 2015).

Findings

The SBE environment provided an opportunity for participants to challenge assumptions, thoughts and views. Many ideas participants discussed were critical of their thinking regarding the SBE experience itself, the clinical placement and whether there was any carry-over effect between the two. Mezirow's theory provided a helpful means of analysing and conceptualising the participant's descriptions of their experiences. These results are examples of ideas from their narratives and their alignment to Mezirow's themes.

Some disorientating dilemmas highlighted in the SBE scenarios included first experiences of an acute ward setting:

it was firstly quite daunting ... it was my first real experience of all the equipment in that sort of setting ... It was my first real experience of working with someone almost in that ... really unwell condition. Participant 4 [P4].

There was a sense of the unknown, the SBE scenario was new to all participants:

you don't really know what's going to happen in there until you go in ... it was interesting because that's sort of similar to what it's like in real life. [P3].

The universality of transformational learning theory application could be seen as participants reflected on their learning in university and on placement. They recognised opportunities for disorientating dilemmas in both locations. For example, one participant spoke about auscultating a respiratory patient:

It's not really until you hear it when you go out on placement, I think that's the thing that sticks with you. [P5].

And the disorientation produced by SBE was quite profound, participants noted feelings of panic, nervousness and inadequacy:

I remember feeling ... quite scared even though it was just ... an artificial simulation. [P1].

really felt like I haven't got the skills to treat this person. [P4].

very low in confidence with my abilities. [P1].

For some participants the escalation within the scenarios was challenging to the point of not being able to think straight:

you're just so worried about everything that you sort of forget your knowledge or forget your reasoning and are just not sure of where to go. [P4]

And so whilst pressure can be transformational, there is the potential for it to be too much, exposing the need for appropriate levels of challenge. Some psychologists refer to the role of 'cognitive dissonance' in learning (Elliot and Devine, 1994), where an appropriate amount of this stimulates learning, but too much can overwhelm and act to prevent learning.

The realism of the ward setting and whether it would be like placement was present in participant narratives, and SBE was viewed as a safe environment to learn in, a feature that assuages against overwhelm:

I think just being exposed to that environment makes it less intimidating. [P2].

it took away a bit, sort of that shock, shock value. [P3].

The feeling of safety provided by the SBE environment enabled participants to trial ideas:

It was a really safe environment to be in ... I knew if I made a mistake firstly there would be no consequences. [P4].

trying different ideas and seeing, and thinking on your feet that requires you to, you know, fail and I think most of my learning occurs through doing, doing things wrong. [P2].

However, some participants felt that it did not provide realism because of the limits to the reality experienced on placement:

The main thing for me was the attachments [...] that was the biggest thing that I wish we would have covered more. [P3].

I don't think anything can prepare you for that human experience. [P2].

Despite the acknowledgement by the participants that they were working with a simulator, there was a real emotional response by participants within SBE experiences that made it different to working with a healthy individual (such as a fellow student):

it is useful to do it on someone who's, or something that's not one of your colleagues. [P2].

There was the ability to develop communication skills that could provide opportunities to develop patient relationships:

you actually got that kind of communication side of things which was quite nice rather than pretending as a student. [P5].

Comments were made about the feeling of pressure and how this might prepare for the experience on placement on an intensive care unit (ICU):

I think for students to go on an ICU placement, it would be important to kind of push them a bit beforehand to see how they reacted. [P3].

Three of the five participants commented that they did not reflect or draw on the SBE scenarios whilst on placement because it was a long time between the SBE and critical care placement, and the scenarios were not replicated on placement. Participants felt that they would benefit from more exposure to SBE to prepare them for placement:

a bit more time would have been useful in terms of getting familiarised with the environment and having to work with other attachments and machines as well. [P3].

Following the recorded SBE scenario there was an opportunity to watch the video and reflect on group observations, decisions and reasoning. This involved the participating group and two observing groups. This method of reflection was a positive experience for all the students involved in the scenario, and students recognised that others shared similar experiences.

it was good for reaffirming what we thought we already knew but also pointing out areas that we needed to improve upon. [P1].

Understanding somebody else's perspective about what you were doing was considered to be important:

that's how I was doing it before so it obviously hadn't been picked up before doing the simulation. [P4].

Opportunities were provided to highlight skills that could be improved and alterations to approaches to situations. There were discussions around feelings evoked; how pressure was experienced throughout the scenario; and being happy to make mistakes in the SBE scenario:

I think getting things wrong in terms of your handling, the way your thought processes work with respiratory stuff, I think it's really good for that. [P2]

if you're doing something wrong and there is a direct consequence then you can take that on board. [P4].

The rational discourse occurred through making sense of the situation with the support of the team and the lecturers, and this was valued by participants. For those watching the real-time feed of the SBE scenario, there were positive outcomes too. By discussing the scenario during the debrief, participants could process the situation and involve the group in how the situation made them feel. One participant thought that this approach may provide other students with information to take forward into practice, although the intensity of emotion would not be felt in the scenario:

They won't have had those same feelings so it probably won't have stuck in their head as much. [P1].

Being an observer of the scenarios could provide a different viewpoint:

you get a different perspective of what is going on rather than being at the forefront of it. [P4].

However, some participants could not remember any of the scenarios that they observed because they had not been involved. This does challenge student engagement whilst observing, and potentially requires strategies to encourage active watching.

The reflective process of debriefing provided ways to improve individually and permitted exploration of other possible actions:

I needed to learn how to help myself in situations like that, how to stay calm and do the best that I can do for my patient. [P1].

in that pressurised situation with the nerves it's always interesting to see how you react ... I definitely had to think about my coping techniques. [P3].

Non-technical skills, involving emotional regulation and cognitive decision-making were reflected upon to explore new avenues for practice:

you've got to be flexible as a physiotherapist ... and really think about other avenues to go down. [P4].

The SBE scenarios were independent of one another and provided opportunities to practice skills and trial ideas that may be used on placement. Participants expressed

that being able to think on their feet and apply different techniques moved them closer to practice, and the ability to get hands on experience was a favoured learning technique:

it's all well and good sitting there in a lecture learning about it but when you actually apply it, for me at least, that's how I learn best. [P4].

one of the most challenging things going forward is bringing it all together in a way that makes sense. [P2].

Being able to follow through a whole encounter with a patient provided opportunities to be systematic, reflecting a closer alliance with placement:

putting in a plan that you've made and like, implementing it by yourself, doing the subjective, the objective and getting used to doing it. [P5].

Opportunities to improve on aspects of practice through the SBE scenario were provided:

I know now how to do a thorough auscultation assessment. [P4].

One participant had warmed up the stethoscope before auscultation and this potential infection risk was highlighted, leading to a change in practice:

I think it's stuck with me for quite a while that that isn't something that I should do. [P5].

SBE scenario allowed participants to combine knowledge learned in lectures into a safe practical environment with real-time responses:

if whatever you're doing is getting this reaction, how can you change it, what are the things that you can try? I think that's something that's a really good skill that you don't really deal with outside the simulations. [P2].

One participant expressed that learning from the SBE scenario provided exposure to a critical care environment, making it less intimidating on placement, in combination with the development of critical reasoning in a dynamic situation. This participant reflected on the reaction they experienced in SBE, and considered that all of these factors had enabled the translation of learning from SBE to clinical placement:

things that I found beneficial in the simulation definitely translate into some of the major learning experiences that I had on placement. [P2].

Two participants discussed skills that they needed to improve following their SBE scenario and this had carried over into their placement. Participants commented that gaining an understanding of where you can improve as a student allowed new learning to be trialled:

when I've been able to go out and apply... that's what really cements it for me. [P5].

Reactions to events in SBE enabled the development of emotional regulation:

I was quite pleased with myself that I dealt with it in a calmish way. [P1].

SBE received a positive response from participants in terms of building competence and self-confidence:

I walked out of the simulation feeling more confident in my practical skills.[4].

... it sort of familiarises you with the environment and what you expect to see around, on the wall and around the bed in terms of monitors and charts. [P3].

... looking at the monitors as well the first time, getting used to all the beeping sounds ... was beneficial in my later placements. [P4].

From initial feelings of inadequacy in SBE there was a change to being able to contribute to the situation:

I did know what was going on, I do know how to treat them but it's just that first initial feeling when you're in that environment. [P4].

The culmination of the SBE scenarios and experiences on placement form a mechanism for problem solving and therefore a foundation for learning:

Thinking about this after placements, you kind of have to try different things out and you have to be willing to think on your feet, I think that is something that is really useful ... that sort of thought process where I'm going to try this and if this doesn't work I'm going to do this and then this. [P2].

Having applied the model fully to participant narratives and finding many points of convergence, the discussion now addresses the meaning of this for teaching and learning.

Discussion

Three lines of enquiry were followed, and the findings suggest that SBE: may have the potential to bridge the gap between the classroom and clinical placement; might assist student physiotherapists to change their practice and may be able to provide an element of preparation for students embarking upon critical care placements when SBE scenarios are underpinned by TLT.

In TLT the inclusion of a 'disorientating dilemma' is thought to be the starting point for new learning, and this can be provided through new environments, situations and experiences such as an introduction to working in an acute ward setting. Participants commented that becoming familiar with an acute ward setting enabled them to feel less daunted when they entered clinical placement, and the prior experience of this environment removed the 'shock factor' of a new situation. Authenticity of experience has been addressed by (Ohtake, Lazarus, Schillo and Rosen, 2013) and whilst it also emerged here too, the focus of this discussion will be on the role of emotion in learning; the therapeutic relationship between physiotherapy student and patient; and effective scenario design to promote learning.

Introducing scenarios that escalated rapidly to mimic deteriorating patients, presented an aspect of pressure to the execution of assessments and decision-making. Pressure in a scenario may prepare students for pressure in a critical care placement by stimulating emotional discomfort, which can provide a catalyst for transformative student learning as suggested by Mezirow (1997). This catalyst has three dimensions: psy-

chological (understanding of the self), convictional (belief system revision) and behavioural (change in lifestyle or approach). Offering rich learning experiences permits development across this spectrum, including the involvement of emotional aspects. When emotions are recognised they can alter thought patterns and affect the experience of how adults learn, providing a symbiosis between emotion and learning in the cognitive experience (Shuck, Albornoz and Winberg, 2013). The importance of emotion in learning has been recognised as having the ability to impede or motivate adult learning (Dirkx, 2001) as well as having a role in cognitive processes (O'regan, 2003). Although stress has the potential to increase memory skills (Kalaniti and Campbell, 2015), the careful regulation of this emotion may be required to prevent it becoming a barrier to learning (Clarke, Horeczko, Cotton and Bair, 2014). SBE has the ability to provide a learning environment with a positive emotional climate that promotes a safe non-judgemental space to trial new skills and ideas, and allow theory to be put into practice, contributing to skill development and translating onto critical care placements. The development of SBE to prepare students for a critical care placement, should consider the promotion of a secure and supportive learning environment and account for the role of emotion in learning to enable students to be more open, and enhance the ability to involve themselves in the learning process (Naude, Van Den Bergh and Kruger, 2014).

Further preparation for critical care placements could consider the enhancement of the therapeutic relationship between physiotherapy student and patient. Working with an unresponsive patient or one with verbal communication impairments may provide new challenges to the physiotherapy student that SBE could begin to address. The ability of the simulator to produce visceral responses such as breathing, heart rate and blood pressure, that students could respond to, as well as providing an opportunity to communicate with someone other than a colleague, were seen.

As advantages of SBE, however, the ability to gain human experience was highlighted as something that SBE was unable to provide and could only be achieved on placement. Although a true therapeutic relationship, commonly defined as 'a means of a communication wherein both therapist and patient interact to achieve a therapeutic goal' (Gartland, 1984), cannot be replicated in SBE due to its bilateral nature, it could be possible to explore the involvement of the physiotherapist in this relationship. SBE has the capability of providing therapy scenarios that require consideration of the patient as a whole and encompasses holistically oriented physiotherapy (Gyllensten, Gard, Salford, and Ekdahl, 1999). This way of working enhances the quality of interaction during treatment to facilitate a successful outcome by focusing on how things are done (rather than what is done). SBE scenarios can combine the approach of treating the 'whole person' with opportunities to practice the use of non-verbal communication skills: touch and proximity, facial expression, eye contact, gestures, posture, observation, listening and the use of silence were highlighted as skills that could enhance the therapeutic relationship and the quality of treatment (Hargreaves, 1982) and be an area of focus for SBE when preparing students for placement. The exploration of the therapeutic relationship for physiotherapy students in SBE could provide future research opportunities.

The inability to draw upon SBE experiences on placement was identified by a participant who had previous experience of a critical care setting. Although Cranton (1994) suggested that it is not necessary to move through each of the 10 phases of TLT to complete learning, this finding may indicate that each theme needs to be experienced to fa-

cilitate the relevance of learning before it can be translated into practice. The capability of SBE scenarios, underpinned by TLT (Mezirow, 1993), to offer the ability to account for previous student experiences is available, but to facilitate learning scenarios may need to be designed with this in mind.

Well-designed SBE scenarios have the ability to influence learning and influence levels of pressure experienced by students. Kelly Macauley and DPI (2016) discussed the importance of the design of the learning experience combined with the potential to match student ability to scenario complexity. Salas, Wilson, Burke and Priest (2005) proposed that scenarios, which allow progression through the cognitive processes required on placement, may provide psychological fidelity to enable learning. SBE has the capacity to gradually increase the complexity and demands of scenarios to match student ability, however, the key to the success of this vehicle for learning is the use of Constructivist Learning Theory (Dewey, 2007) whereby students learn by doing and create their own understanding. Including factors such as student ability and experience in SBE scenario design can therefore, affect the facilitation of a student through the phases of TLT from their current thinking and practice to a new level of learning and change in perspective, and could provide an area for further research.

The use of learning theory, in this case TLT, to facilitate learning through SBE scenario experiences that prepare physiotherapy students for critical care placements, has been indicated for developing a closer alliance between SBE and clinical placement. Well-designed scenarios that account for student ability to provide a disorientating dilemma, supported by critical reflections and rational discourse, with time to allow individuals to carry out a plan of action combining aspects of clinical reasoning, and skills learned in the classroom in a real time environment have the potential to provide a sound preparation for critical care placements. The importance of developing emotional self-awareness is shown in the Health and Safety Executive (2016-17) which shows that stress, depression or anxiety explained 40 per cent of all occupational health cases and nearly 50 per cent of all working days lost due to illness. SBE is a powerful learning tool if grounded in evidence-based pedagogy, such as TLT, and further research is needed into the influence of well-designed SBE scenarios offering specific and appropriate challenge. To be effective it can be seen that the scenarios are required to be commensurate with previous learning experiences, reflective of student ability and present as incremental in complexity and demand.

The use of the interpretive lens of TLT to analyse data in this study became restrictive when representing findings that overlapped themes. This method of analysis on data missed opportunities for interpretation to further meaning that had not been captured by the model, such as tensions and contradictions between safe and unsafe, representative and unrepresentative. The ability to apply secondary analysis was also limited by this model.

The study design creates a selection bias in that voluntary participation may have influenced self-selection of students who had positive SBE experiences rather than a more representative sample. Throughout this qualitative research process reflexivity has been applied to provide rigor, and lack of bias to enhance accuracy and credibility of findings (Berger, 2015). But as with all insider research, this may have affected the researcher-researched relationship during interviews as well as interpretation of data in unappreciated ways.

Qualitative methods are not intended to be generalisable, but rather involve methodological approaches to demonstrate appropriate rigor (Morse, Barrett, Mayan, Olson and Spiers, 2002), including issues such as: member checking of coding, discussing the findings with participants, consideration of negative cases and appropriate use of reference material. Seen in this way, publishing then becomes a means of achieving structural corroboration, and it is for readers to determine whether these findings, such as support for developing therapeutic relationships and the importance of effective scenario design, highlighted in this study, can be transferred to their own settings (Krefting, 1991).

Conclusion

SBE has the potential to prepare physiotherapy students for critical care placements when it is seen as grounded in an educational learning theory such as TL. SBE has the ability to: use the relationship between emotion and learning in the cognitive experience of skill development; enable familiarisation of the critical care environment; explore the therapeutic relationship, from the physiotherapist's perspective, to enable insights into how to 'be' with patients in critical care environments when SBE scenarios have been designed to account for learning outcomes and past experiences.

Mezirow's (1993) theory of disorientation and resolution, is one that can be applied more widely to all teaching. It is a paradox within higher education that anxiety is necessary, but also forms a source of distress (Bunce, et al., 2017). It seems that being realistic about the emotional aspects of learning and supporting students with processing feelings, could not only assist student health, but also encourage and facilitate learning.

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Accelerated learning at Masters' level: Problem Based Learning of Diagnostic Reasoning skills by Physician Associate Students

DR NICOLA DEARNLEY AND DR WESLEY SCOTT-SMITH

BRIGHTON AND SUSSEX MEDICAL SCHOOL

Abstract

Physician Associates (PA) complete a two year postgraduate course, and are expected to graduate with diagnostic skills equivalent to those of newly qualified doctors who have completed a five year course. BSMS has utilised Problem Based Learning (PBL) in an attempt to accelerate the acquisition of these skills by PAs. Weekly PBL sessions were conducted during year 1 of the PA course, focusing on the 'top 20' core conditions within the curriculum. Alongside this, students had weekly clinical exposure in General practice. In order to assess the impact of this strategy the 'Diagnostic Thinking Inventory' (DTI) developed by Bordage et al. (1990) was conducted three times across year 1 and the results compared to standardised data for medical students and doctors. This found that PA students had a significantly higher baseline score in terms of *flexibility of thinking* (equivalent to newly qualified doctors engaged in foundation training) and *structure of memory* (equivalent to third year medical students). Results showed a statistically significant improvement in structure of memory across year 1: achieving an improvement in score which took over four years to achieve in medical students. This appears to suggest that PBL can facilitate increased assimilation of diagnostic reasoning skills within postgraduate learners.

Keywords: Physician Associate, Diagnostic Reasoning, Problem Based Learning, Postgraduate.

Introduction

A Physician Associate (PA) has been defined by the Department of Health as '...a new healthcare professional who, while not a doctor, works to the medical model, with the attitudes, skills and knowledge base to deliver holistic care and treatment within the general medical and/or general practice team under defined levels of supervision' (2012). The number of PAs is expected to increase substantially to meet the increasing demands on the National Health Service (NHS). Having trained in the medical model, PAs are able to undertake diagnosis, and this is seen as a key reason for the employment of PAs as opposed to other advanced healthcare practitioners.

Brighton and Sussex Medical School (BSMS) began delivering a postgraduate clinical diploma in Physician Associate Studies in September 2016. This is a two year post-graduate course and is delivered at masters level (level-7). Entrants are required to have gained a 2:1 or higher in a biomedical science or healthcare sciences degree. The PA curriculum is mapped against the Department of Health document 'Competence and Curriculum Framework for the Physician Associate' (2016), which outlines the skills expected of newly qualified PAs. This mirrors the mapping of medical school undergraduate curriculums to the General Medical Council's 'Outcomes for provisionally registered doctors with a license to practice' (2015) and there is substantial overlap between these two documents.

The Competence and Curriculum Framework uses a model for categorising clinical conditions on the basis of the skills and knowledge required to diagnose them. Each clinical condition is assigned a category as shown in figure 1 (below). A PA is expected to be able to independently diagnose a '1a' condition (examples include: hypertension, gout, depression, and migraine). For '1b' conditions, PAs are expected to 'identify the condition as a possible diagnosis' (examples include: myocardial infarction, acute pancreatitis, thyroiditis and malaria).

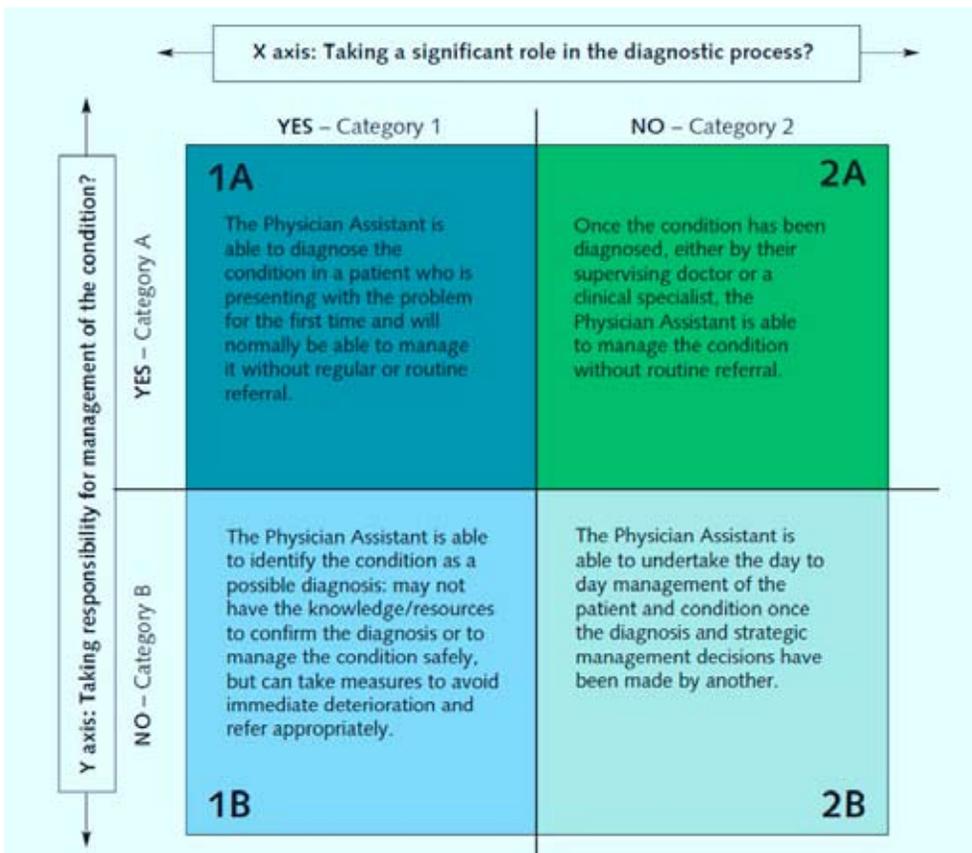
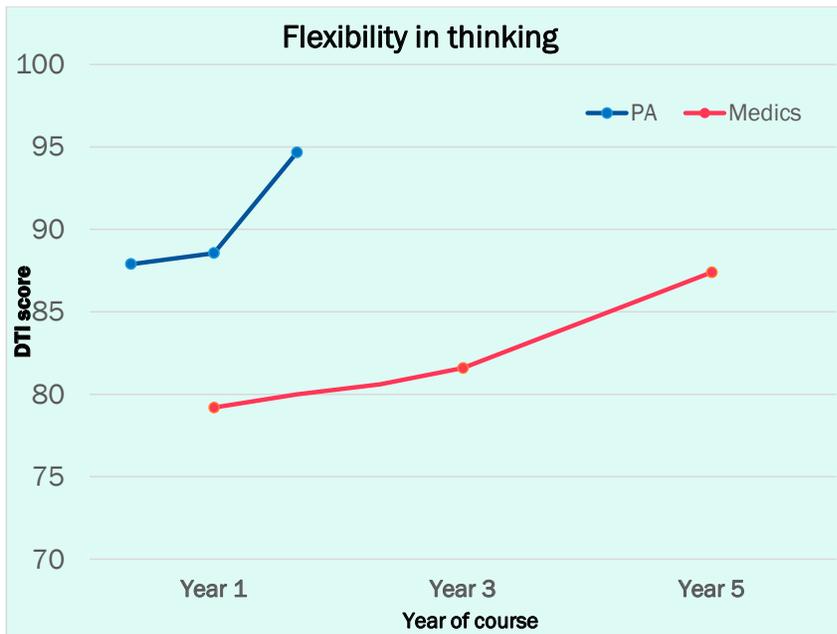


Figure 1: Matrix for categorising clinical conditions on the basis of required competence (R.C.O.P.F.O.P. Associates, 2016)

In order to achieve these outcomes PA graduates must assimilate the diagnostic skills that are arguably equivalent to those of newly graduated doctors. Given that the PA course lasts for two years (as opposed to five+ for doctors) these skills must be developed at an accelerated pace. To achieve this, BSMS must ensure that it is utilising educational pedagogies with a robust evidence base. Recognising this challenge, the BSMS PA course team adopted an explicit strategy to develop diagnostic reasoning within this cohort. This took the form of framework lectures exploring diagnostic reasoning and illness scripts, followed by weekly Problem Based Learning (PBL) sessions with a diagnostic reasoning focus.

To assess the effectiveness of PBL in developing diagnostic reasoning among the year 1 cohort (n=9). The course team used the Diagnostic Thinking Inventory (DTI) developed by Bordage et al. (1990). This is a validated 41 question inventory designed to quantitatively measure two aspects of diagnostic thinking: 'flexibility in thinking' and 'knowledge structure' of memory. This produces a score which can be compared to standardised groups at different levels of medical training. The DTI was conducted at three points across year 1 of the PA course in order to map the development of diagnostic thinking among PAs, and compare it with the pace of development amongst medical students, (see Graphs 1 and 2).



Graph 1. Flexibility in thinking

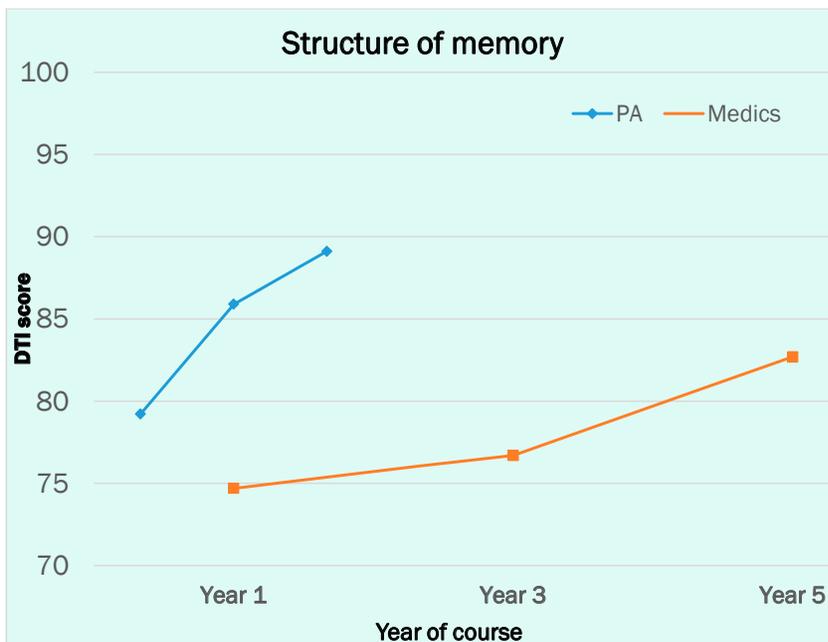
Medical education has a strong culture of research and critical appraisal of literature when considering appropriate learning pedagogies, therefore it is important to explore what is known about how healthcare professionals develop diagnostic reasoning skills, and appraise the evidence-base for using PBL to foster this skills acquisition.

Clinical and diagnostic reasoning

Cervero (1988) defined clinical reasoning as ‘the sum of the thinking and decision-making processes associated with clinical practice; it is a critical skill in the health professions, central to the practice of professional autonomy and it enables practitioners to take ‘wise’ action, meaning to take the best judged action in a specific context’. Clinical reasoning is an umbrella term used widely in the literature to encompass a number of different aspects outlined in table 1 (over).

The research described in this paper specifically seeks to examine the *diagnostic* reasoning of the PA cohort. However, theoretical accounts of its development in the literature often fail to distinguish diagnostic reasoning from clinical reasoning as a whole. It is important to be mindful of this important distinction when analysing or interpreting the evidence base.

Interest in the diagnostic reasoning process has been recently renewed in an attempt to reduce error within the diagnostic pathway. The most recent proposal is the ‘dual process theory’ (Croskerry, 2009). This describes two modes of processing. In system 1, reasoning is proceeded by a fast, unconscious retrieval process. This is viewed as inherently error prone. System 2 is a more deliberate, conscious and logical process. The



Graph 2. Structure of memory

level of complexity of the case determines which system is utilised. It is theorised that increasing one’s reliance on system 2 can improve diagnostic reasoning and reduce errors. This theory was the subject of a best-selling book by Kahneman entitled *Thinking, fast and slow* (2011).

Diagnostic reasoning	Reasoning which aims to reveal the clients' impairment(s) disability(ies) and handicap(s) and the underlying pathobiological mechanisms.
Interactive reasoning	Occurs when dialogue in the form of social exchange is used deliberately to enhance or facilitate the assessment/management process. This reasoning provides an effective means of better understanding the context in which the patient's problems exist while creating a relationship of interest and trust.
Narrative reasoning	Involves the use of stories regarding past or present patients to further understand and manage a clinical situation.
Collaborative reasoning	Shared decision making that ideally occurs between practitioner and patient. Here the patient's opinions as well as information about the problem are actively sought and utilised.
Predictive or conditional reasoning	Part of the practitioner's thinking directed to estimating patient's response to treatment and likely outcomes of management, based on information obtained through the patient interview, physical examination and response to management.
Ethical or pragmatic reasoning	Alludes to those less recognised, but frequently made decisions regarding moral, political and economic dilemmas which clinicians regularly confront, such as deciding how long to continue treatment.
Teaching as reasoning	Occurs when practitioners consciously use advice, instruction and guidance for the purpose of promoting change in the patients understanding, feelings and behaviour.

Table 1. Domains of Clinical Reasoning (Adapted from *Clinical Reasoning in the Health Professions*, Higgs, 2008)

Whilst we recognise that a medical school must produce able diagnosticians, little is certain regarding *how* a student develops this vital skill, and therefore how best to foster its acquisition. In seeking to address this problem, Schmidt and Boshuizen (1992; 1993; 2008) proposed a staged theory, whereby knowledge acquisition and clinical skills are developed hand-in-hand. They recognised that diagnostic competence develops not only through knowledge expansion, but through knowledge restructuring as outlined in table 2 (over).

<p>Stage 1: Knowledge network</p>	<p>Students acquire large volumes of knowledge regarding basic biomedical sciences linked together in a knowledge network. This is a constant process of adding new concepts, strengthening connections between items. Lines of reasoning consist of small chains of small steps commonly based on underlying biomedical concepts.</p>
<p>Stage 2: Knowledge encapsulation</p>	<p>As direct lines of reasoning between concepts are activated more often, these concepts cluster together, and students become able to make direct links between first and last concept, skipping intermediate concepts. Biomedical knowledge has been encapsulated with clinical knowledge; students tend to make direct links between patient findings and clinical concepts such as a diagnosis. However, if there is a complex clinical problem biomedical knowledge can be drawn on.</p>
<p>Stage 3: Illness scripts</p>	<p>Illness scripts are a structure of knowledge organisation with three components:</p> <ul style="list-style-type: none"> • Enabling conditions of disease: Personal, social, medical, hereditary and environmental factors which effect health and/or a specific disease • Fault: Pathophysiological process which is occurring • Consequences of fault: Signs and symptoms of a specific disease <p>Unlike novice knowledge networks, Illness scripts are activated as a whole. No active small step search within that script is required.</p>

Table 2. Staged theory of the development of medical expertise (Higgs, 2008)

Problem Based Learning

Problem based learning (PBL) is a student-centred pedagogy in which students learn through the experience of solving a problem found in trigger material. Students are encouraged to define their own learning outcomes based upon the material. Barrows (1986) states: 'The increasingly popular term 'problem-based learning' does not refer to a specific educational method. It can have many different meanings depending on the design of the educational method employed'. This statement is certainly reflected in the literature, where a wide range of different setups are all included and discussed under the heading 'Problem Based Learning'. This occurs both within healthcare and wider educational domains (Koh et al., 2008; Savery, 2015).

Many medical schools within the UK and abroad have adopted a PBL curriculum, or utilised PBL to some degree. In 2004, the European Network of Occupational Therapy

in Higher Education (ENOTHE) declared PBL the learning method of choice, however the evidence to support this claim is far from robust.

In 2012, Thistelwaite et al. (2012) performed a systematic review of PBL for health professional education. For inclusion, papers were required to have outcome data regarding the effectiveness of PBL. An important consideration when appraising evidence is what outcomes are being assessed and therefore the strength of evidence this represents. Kirkpatrick's hierarchy (Kirkpatrick, 1967; figure 2) offers a structure for appraising interventions in medical education. This systematic review required included papers to adopt outcome measures at level 2 or above of Kirkpatrick's hierarchy. 104 papers were included in the review, of which 23 per cent were judged as having higher quality and significance (although arguably this was a subjective assessment). The researchers concluded that PBL is enjoyable for students, and that students believe that it enhances their learning. However, it was inconclusive with regards to the effectiveness of PBL compared to other types of activity. When considering Kirkpatrick's hierarchy, this only represents level 1 evidence (participant reaction and/or self-reported learning). There are many limitations to this study. The authors themselves state: 'We decided to have wide inclusion criteria and not limit this review to medical education'. Whilst arguably this will allow more studies to be included, it will mean that the data may be less applicable and therefore the evidence less robust in relation to my population of interest.

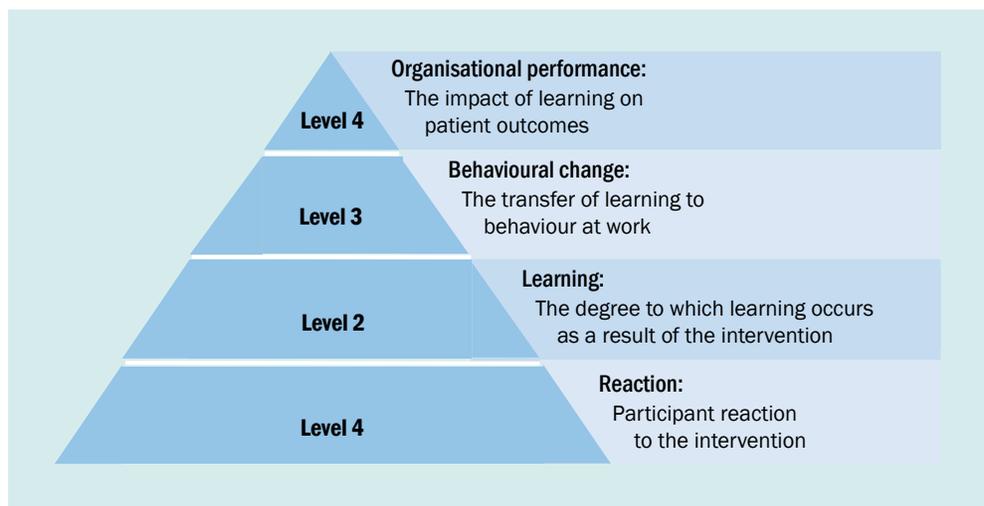


Figure 2: Kirkpatrick's Four-level training evaluation model

In 1987, Schmidt et al. (1987) sought to review studies that examined the learning outcomes of doctors who had experienced a PBL curriculum compared to a traditional curriculum. This is an important paper as it seeks to collate outcomes at level 2 of Kirkpatrick's hierarchy, which the previous systematic review was not able to demonstrate. With regards to academic achievement, Saunders et al. (1989) administered a multiple choice knowledge test to final year students at The University of Sydney (traditional curriculum, n=243) and The University of Newcastle, Australia (PBL curriculum, n=45). They found a small but statistically significant difference in scores in favour of the

traditional curriculum (Sydney = 71 per cent, Newcastle = 67 per cent). However, it was recognised by the researchers that the Newcastle students had not previously undertaken assessment using multiple choice assessment format. This is likely to have had a substantial impact on their overall scores, and call into question the validity of the study results.

Friedman et al. (1990) sought to investigate performance at work after graduation in those who had completed both types of curriculum. This sought to look at level 3 of Kirkpatrick's hierarchy: behavioural change. They examined the performance of a group of Canadian medical school graduates via reports from supervisors where they had to rate performance against the average intern in their programme. They found that 26.1 per cent of graduates from McMaster University (which adopted a PBL curriculum) were rated as performing much better than the average intern, 38.3 per cent as performing better, 28.7 per cent as average and just 6.9 per cent as weaker than the average intern. However, there are many methodological flaws with this study. The question 'how does this graduate compare with the average intern?' is entirely non-specific and may be judged according to different criteria by different supervisors. The study was not blinded, which may have led to confirmation bias depending on the supervisor's personal opinion on PBL.

For any study attempting to compare outcomes between two different curriculums, there are many more variables to consider than purely PBL or traditional curriculum. Students are not randomly assigned to each curriculum; a requirement for a pure experimental research design. There are a wide range of confounding factors, which make it difficult to associate any differences in outcomes purely to the use or otherwise of PBL. Differences in student selection, attrition rates, and other aspects of course design and clinical exposure will all effect outcomes, and mean studies looking at these elements cannot conclusively prove the impact of case based learning outcomes.

Can PBL facilitate the development of diagnostic reasoning skills?

Now we have considered the evidence for the development of diagnostic reasoning skills and the use of PBL we must consider if one can be used to foster the other.

Goss et al. (2011) sought to compare the diagnostic reasoning skills of students who engaged in PBL compared to a traditional curriculum. They performed a cross-sectional study at the University of Melbourne whilst the transition from a traditional to a PBL curriculum was occurring, and used the DTI to quantitatively score participants (n=431) diagnostic reasoning skills. As one may expect, they found that DTI scores were higher on completion of the course than they were in the early clinical stages. However, they also found that students completing the traditional curriculum had higher DTI scores at the end of year 1 and at the end of the course, compared with those completing the PBL curriculum ($p=0.<001$). There are several limitations to this study. The structure of the curriculum changed considerably during the study. In particular, the PBL curriculum included an additional, research-focused year before students entered their clinical years. This period away from immersion with clinical cases may have led to a degradation in their diagnostic reasoning. Moreover, in the traditional curriculum, clinical placements were three years in duration compared to two and a half years in the PBL curriculum. These wide differences in structure mean it is impossible to say with any certainty that

the differences in DTI scores can be directly attributable to the PBL component of the new curriculum.

As previously discussed, PBL is a broad term which encompasses a variety of 'delivery' methods. So it is important to consider whether specific types of PBL are better at developing diagnostic thinking skills in the context of the theories outlined above.

When discussing 'dual process' theory, Kahneman suggests three methods which may reduce errors and improve performance: 'slowing down', 'reflection' and 'cognitive forcing'. Cognitive forcing involves giving participants a set of warnings with regards to cognitive biases in order to encourage metacognition (an increased awareness of one's own thought processes). This is derived from an idea that diagnostic error is a result of multiple cognitive biases, and if one is able to reduce these they would thereby reduce diagnostic error. These strategies may all be employed by a skilled PBL facilitator; encouraging participants to think slowly and systematically during discussions within a CBL session. This assumption is at odds with a study performed by Sherbino et al. (2012) who found increased diagnostic accuracy with faster response times. However, this latter study was performed on 75 medical graduates and faster response times may simply reflect the fact that they know the correct answer via either pathway, rather than simply indicating that system 2 thinking is less error-prone.

Schmidt and Boshuizens' stages of development of clinical reasoning have formation of illness scripts as the most advanced form of 'mental model'. Some have therefore, theorised that using illness scripts in a PBL session may facilitate the development of this type of mental model in learners and advance diagnostic reasoning skills. Ho et al. (2010) performed a study to assess if providing students (n=53) with a three hour workshop using illness scripts had an impact on students' DTI scores or subsequent performance on a clinical reasoning problem task. They found no change in DTI score between the two groups' pre-and post-workshop. However, when looking at performance on a clinical reasoning task, they did find a statistically significant increase in scores in the intervention group (mean improvement = 14 per cent, 95 per cent CI = 8 per cent-21 per cent). Whilst this may suggest that using illness scripts has little effect on diagnostic thinking, it is important to note that the study was rather small. The clinical reasoning task was completed by individuals as a computer based assessment, which cannot replicate the complexities of a group PBL setting. During first-hand experience of conducting PBL using illness scripts, students say they have found this useful in their revision and are creating revision notes on a condition based on an illness script.

Chamberland et al. (2015) explored the use of self-explanation in the development of diagnostic reasoning skills. Self-explanation is an active learning process which requires the learner to generate explanations to oneself whilst working through a clinical case. They also sought to assess the impact of the student hearing a more experienced clinician's example self-explanation, and the addition of prompts to this self-explanation to encourage the processing of the example in a specific structured way. These prompts may be used to link biomedical knowledge with clinical knowledge. 58 Year-3 medical students who took part in the study were randomised into three groups. All completed 12 clinical cases with a diagnostic focus. For all groups the first four cases were 'training cases', in which students were asked to use self-explanation after a brief demonstration. After these first cases, Group 1 were able to listen to examples of a clinician's self-explanation with prompts. Group 2 listened to clinician's self-explanation without

prompts. The Control Group solved word puzzles. All Groups then completed eight further cases (four familiar, four unfamiliar). The researchers found that the diagnostic accuracy of all three Groups improved between the training and assessment phase, but Group 1 showed a statistically higher diagnostic performance score in the assessments than the Control Group ($p=0.037$). When looking at the unfamiliar cases alone, Group 1 showed an even greater improvement in diagnostic performance score compared to the control group ($p<0.001$) and compared to Group 2 ($p=0.018$). This study supports the use of self-explanation, particularly if this is able to be combined with examples of a more experienced clinicians thought process presented in a structured way via prompts. The principle of self-explanation is commonly applied within PBL, with students having to justify their thought processes to the group. It is also possible for the facilitator to demonstrate their own 'expert' thought processes; however, this does require a degree of expert knowledge which is not strictly necessary in order to facilitate a PBL session.

Despite the broad uptake of PBL within medical education the literature is divided and unclear with regards to its effectiveness as a pedagogy. Whilst it seems clear that students enjoy PBL, evidence at higher levels of Kirkpatrick's hierarchy is lacking, and when studies attempt to address this gap, methodology and confounding factors make the results difficult to interpret and apply more broadly. There is clear need for further, more robust, research into this area.

However, there are a number of strategies which do show promise in maximising diagnostic reasoning acquisition within a PBL setting, and specifically that have been utilised within the PBL sessions at BSMS. These include encouraging self-explanation in the participants, as well as giving examples of clinicians thought processes, and the use of an illness script approach.

Current research

Results are currently available from the first year of this study in Year 1 PA students ($n=9$). These results demonstrated that PA students began the course with higher DTI scores in both domains compared with medical students. This may reflect the fact that PA students are postgraduate with greater life experiences, and it could be argued that they should be more fairly compared with fourth year medical students from a school entry programme. Even using this as a comparator, the PA students are performing better in terms of flexibility of thinking, and at a similar level in terms of structure of memory.

There are a number of possible explanations for these results. It may be that students who are naturally skilled in structure and flexibility of thought are self-selecting into the PA course. It is possible that PA students' first degrees are equipping them with skills which can be quickly applied to diagnostic reasoning. Conversely it is possible that the medical school curriculum is not fostering these skills in its undergraduate students, however, this is difficult to assess further due to a wide variety in practice across UK medical schools, as well as a lack of clarity with regards to how the standardised DTI data was derived.

Conclusion

These early results suggest that as well as entering the course with better diagnostic thinking skills than undergraduate medical students, PAs are subsequently developing these skills further at an accelerated trajectory. Whilst one can argue there may be con-

founding factors other than simply a PBL curriculum, this study appears to support the use of PBL and the current BSMS PA curriculum format.

However, when considering the implications of these findings it is important to recognise that weekly PBL sessions are labour-intensive, requiring a high level of facilitator input. Even if this methodology was to demonstrate clear benefit, it may be practically challenging for a medical school with a large numbers of students.

There are a number of significant limitations to this research. A small cohort means the results may not necessarily be transferrable to the PA student population. BSMS has higher entry criteria than some UK universities offering PA courses, and this may reflect in their DTI scores.

This does support the need for further research into this rapidly emerging area of medical education. This study will continue into the 2017-18 cohort in order to increase numbers, as well as follow the current cohort through into the second year of their course. Qualitative research will also be undertaken to try and understand in more depth how PA students are using PBL to further their diagnostic reasoning skills.

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Biographies

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Employment Engagement Mosaic: a tool to measure scholarly engagement with employers

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Abstract

This article is based on research that forms part of The Scholarship Project. This three-year long, nationwide initiative involves 46 colleges and is designed to create a framework of support for the development of scholarly activity within College Higher Education (CHE) in further education colleges. The Scholarship Project uses Boyer's (1990) scholarship of 'teaching, integration and application' as its theoretical framework, and brings together teachers, students and employers. The aim is to develop a model of scholarly activity that will improve teaching and learning by transforming, transmitting and extending knowledge, and also enhance peer support and mentoring. Initial reconnaissance work involved sending a survey to 46 partner colleges to identify and measure employee engagement (EE) and test whether engagement was scholarly. This article explores a trial and test developed from the initial survey in four partner colleges, discusses the findings and considers how the engagement can be mapped against reliable indicators, and how to disseminate that information. Findings are mapped against Boyer's Models of Scholarship and demonstrate that the engagement has a scholarly profile. The implications for the more technical CHE are that there are many creative and innovative ways of working with employers.

Introduction

The Association of Colleges (AoC) HEFCE Catalyst Funding Project: Enhancing College Higher Education Scholarship and Student Learning Project, commonly known as The Scholarship Project, is a three-year research project that aims to create a framework that will support CHE. The project runs until May 2018 after which The Scholarship Framework will be ready for publication. This project supports the development of a distinct College Higher Education (CHE) scholarly ethos (AoC, 2015a) which places student enhancement and ultimately, employability central to the process. The project uses Boyer's Models of Scholarship as a theoretical framework and in particular that of 'the scholarship of integration; the scholarship of application; and the scholarship of teaching' (Boyer, 1990, p.16). Boyer's 'scholarship of discovery' (op. cit.) is situated within the more research active higher education institutions (HEI) (Simmons and Lea, 2013) although the work of the whole project sits within this model of scholarship. According to the QAA, 'Scholarly activity undertaken in a college-based context will not necessarily involve original research, or lead to the production of new knowledge ...' (2015, p.34) hence the need to identify other methods of scholarship within CHE.

An employer engagement (EE) survey with nine indicators (Davy, 2016) was sent out during the reconnaissance phase of the project to teaching staff within the 46 partner colleges participating in the project. The survey's nine identified indicators of good quality EE practice that might be seen in HEI's were:

- Surveying/speaking to employers in the market research phase of programme development
- Actively involving employers in curriculum and programme development, including project briefs and assessment
- Employers as expert advisors during the validation process
- Employers teaching on programmes at college or in the workplace
- Work-based teaching and learning sessions
- Employers providing work experience placements and internships
- Assessment in the workplace, including employers acting as assessors
- Monitoring visits by teaching staff to employers premises
- Employer involvement in assessment boards or end-of-programme assessment events.

The subsequent results proved a revelation to all members of the scholarship project team, including the project leaders and the locally placed Scholarship Development Managers (SDM) who support a cluster of partner colleges. The results showed that most of the participating institutions had difficulty meeting at least five of the nine indicators on each programme. The general consensus was that while the indicators demonstrated good quality EE, they might not all be suitable for the more technical CHE.

Following the reconnaissance phase, small action research projects formed part of the trial and test stage of the project. This paper discusses the findings of a trial and test carried out by the SDM in four of the partner colleges participating in The Scholarship Project (East Surrey College; the Guildford College Group, including Guildford College and Merrist Wood College; Peter Symonds College) to identify the types of EE that took place, identify whether they have a scholarly profile using the work of Boyer, and sharing exemplary practice across the colleges to enhance the offer to students. This method of EE will also be included in The Scholarship Framework (forthcoming).

Methodology

Using the original survey results from this group of colleges, participants were invited to contribute through purposive sampling (Cohen et al., 2007, p.114). The action research approach applied to the study offered the opportunity to identify activity that demonstrates scholarship, and to test the original nine indicators for suitability for CHE. Data was collected through interviews with three members of staff, three students and three employers at each of the four colleges. The interview questions were formed from the original indicators and those interviewed were encouraged to offer unstructured

responses (Tuckman, 1972 in Cohen et al., 2007, p.359) which allows respondents to elaborate their answers.

Once the type of EE had been identified, findings were mapped against Boyer's Models of Scholarship (see mauve tiles in mosaic in Figure 1) to ensure that the engagement had a scholarly profile. If scholarship was identified, the engagement was added to a mosaic already populated with Davy's indicators and the types of engagement identified from other relevant literature. The mosaic provides a visual representation of EE and is used to demonstrate that there are innovative methods of EE. The last stage of the process involved writing case studies that will share the EE and demonstrate how it is mapped against the work of Boyer.

To gather information, Davy's indicators were used as prompts during 'an open-ended interview' (Noaks and Wincup, 2004, p.80). In all cases, the recording is confidential and a case study of the practice is written after mapping with Boyer's work suggests that the practice is scholarly. Once staff, students or employers were identified from the initial survey, they were interviewed using a digital voice recorder from which, a case study was written. All stakeholders (teacher, student and employer) mentioned in the case study were able to make a contribution before the case study was finalised.

Contributions were from a range of programmes including Access to Higher Education; Higher National Certificate's; Higher National Diploma's; Foundation Degrees and BA (Hons) Top-Ups from a wide range of programmes including Nursing; Golf Management; Civil Engineering; Early Years; Theatrical, Media and Special Effects Make-Up; Health and Social Care and Construction.

Ethical issues are resolved on various levels with The Scholarship Project using BERA (2011) ethical guidelines, which all stakeholders were informed of at the start of this project and are constantly reminded of throughout. Staff and students are also advised to take heed of their college ethics policies at a local level. All stakeholders and in particular employers, are asked to read the case study, contribute to and agree (or disagree) for information to be used with informed consent (Cohen et al., 2007). Once this is agreed, the case studies will be shared initially across the consortium and through the project.

As previously mentioned, findings were then mapped against Boyer's Models of Scholarship and if the engagement is scholarly, it is added to a mosaic (over). This mosaic, re-contextualised from the work of Clark and Moss (2001) is quite localised due to the types of programmes that the colleges in this trial and test offer, but can be adapted to suit other institutions offering CHE.

The mosaic, like any tiled space, is open to the manipulations and interpretations of individual colleges, although it is recommended that Davy's (2016) indicators (blue tiles) remain as part of the mosaic, as do sources of information found in relevant literature (green tiles). The remainder of the tiles (mauve) can be populated to suit each college as long as the findings are mapped against Boyer's Models of Scholarship (1990) through his original writing and other related literature. For this particular trial and test the work of Nibbert (1996), Boyd (2013), McNabb and Pawlyshyn (2014), Healey et al. (2014), The University of Adelaide (2015) and Boyer's updated and expanded work (Moser et al. 2016) was used.

Through this ethnomethodological approach, which is concerned with how people make sense of their world (Garfinkel, 1967, in Cohen et al., 2007), the mosaic already

Employers acting as mentors (HEFCE, 2009)	Use of employers worksite for students to study environment or site visits (such as architects)	Surveying, speaking to employers in the market research phase of programme development	1 Joint participation (student and employers) in competitions (local/national)	2 Problem solving assignments for students that benefit the business (HEFCE, 2009)
Students undertaking projects that create a culture of change in employers settings	Employer involvement in assessment boards or end-of-programme assessment events	Students leading practice	Employers as expert advisors during the validation process	Students as arbitrators of change
Actively involving employers in curriculum and programme development, including project briefs and assessment	3 Employers offering the use of and heavily discounted state of the art resources that cannot be afforded by colleges	Assessment in the workplace, including employers acting as assessors	4 Staff, student and employer forums	Employers teaching on programmes at college or in the workplace
Teacher practitioner using their contacts to enhance student experience	Monitoring visits by teaching staff to employers premises	Programme used as a recruitment zone	Employers providing work experience placements and internships	Students running events for the employer
Staff encouraging sponsorship for resourcing programmes	Team building in a real world setting	Work-based teaching and learning sessions	Employers inviting students to meet the experts and professionals they are studying	Employers delivering outside of the curriculum e.g. the importance of social networking

Employer Engagement Mosaic from this trial and test (May, 2017)

populated by Davy's indicators and information from the Higher Education Funding Council for England (HEFCE, 2009), can take any form or shape so that it may include all findings.

Triangulation (Cohen et al., 2007) is secured when a case study is developed. It is shared with all stakeholders mentioned. All are encouraged to contribute to the document but if this is not desirable, need to give permission for the case study to be used. For example, if the case study is developed following an interview with a student, the student reads and edits the subsequent document as appropriate, then employers and teaching staff (if mentioned) will be able to read it and contribute to it before it is finalised. This constructivist approach (Silverman, 2006) is all part of the process that supports the development of scholarship and working towards 'HEness' (Lea and Simmons, 2012) that this research project has facilitated.

Findings

The trial and test identified that EE can be used as a scholarly activity but also that institutions need to do much more to improve this engagement, since much of the relationship is built up by teaching staff. To achieve this, staff have moved from the 'transactory to the transformative' (Lea, 2017) process of EE offering enhanced provision for students. This is explained by the work of Lea and Simmons in which they consider that there are 'four lenses' (2012, p.182) that explore higher education in a further education environment, which has informed this trial and test. The four lenses (Institutional autonomy; Autonomy and the curriculum; Autonomy and pedagogy; Autonomy and research) 'relate to the degree of autonomy required to effectively nurture the culture of HEness ...' and 'Autonomy and the curriculum' (Simmons and Lea, 2013, p.3) sits well with the results of this trial and test where usually compliance, that is a recognised part of the further education culture is ignored, and teachers are building innovative relationships with employers. Accordingly, staff autonomously engage with employers to suit the unique needs of each programme and student cohort. This oddity could be because of financial constraints in further education, limited resources and the desire of teaching staff to stay in touch with their profession. As discussed, the employer engagement identified during the interviews is mapped against Boyer's Models of Scholarship to identify whether they are scholarly in nature. Excerpts from the case studies are included and discussed below in the selected examples.

The use of state of the art resources

Links to the Mosaic: (1) Employers offer the use of, and heavily discounted state of the art resources (Special Effects Make-Up, Golf Management) that colleges cannot afford, or the use of worksites either for site visits (Architecture) or to study the environment (Civil Engineering).

[...] brings her expertise (and resources) into the classroom and teaches high-tech prosthetic techniques to the students because the course has a strong technical element, and I would not be doing my job if I did not make sure that the students were using the most up to date products and learning any current techniques. (Teacher 1 [T1]).

Without the prosthetic material, I would not be prepared for working.
(Student 1 [S1]).

We don't have the facilities, so we use employer's sites for free to study. [T2].

We don't have the facilities, so we go to local facilities for free (if I know them) or they are heavily discounted. The student pays for that. [T4].

I have invited in this guy with a 3-D high tech analysis system that helps the students see their swing (golf) so they know how to improve it and better understand the body movements for clients in the future. We could not afford this equipment. [T4].

Through the use of learning theory, mentoring and innovative teaching materials (AoC, 2016) the scholarship of teaching applies. At the same time, the use of landscape and equipment for student development sits within the scholarship of application (Boyd, 2013), where the student seeks ways to implement and apply new knowledge (University of Adelaide, 2015). Accordingly, Boyer's statement that '... theory and practice vitally interact, and one renews the other' (1990, p.23) supports the inclusion of this finding in the mosaic.

Problem solving in the workplace

Links to the Mosaic: (2) Students undertake problem solving in the workplace (Aviation, IT, Early Years) or leading practice either as a manager, or in a school where the teacher is not experienced in the Early Years field. Students also introduce new policy and practice into the workplace either in the role of a practitioner or a manager, particularly in early years settings.

My Headmaster is very supportive and likes the changes that I have put into place. I had to do an interview, but I was promoted to lead the department and have made significant changes. [S1].

There is much in the literature about students as 'change agents' (Kay et al., 2010) and 'students as partners' (Healey et al., 2014a) but this tends to be between students and the institute. However, results have demonstrated that students are problem solving in the workplace, and this joint activity with student and employer working together can also be associated with Wenger's community of practice (2001).

For working students, the literature is sparse and while heutagogy (Hase and Kenyon, 2001; Bhoyrub, 2010; Blaschke, 2012) is a close fit, some of the literature suggests that students take responsibility (op. cit.) which could cast the student as a deficit model rather than one that allows the student to build on their own professional experience. Research for the purpose of this report to date, has not identified literature about students leading practice or applying change to improve practice. However, Boyer's scholarship of application (1990), where community and professional engagement (University of Adelaide, 2015) and students applying their 'knowledge and skills in work-based placements' (Healey et al., 2014b, p.56) supports this finding. For example, in order to do this, early years students constantly apply theory to practice and undertake small

scale projects within their work setting, which improves their practice as they constantly link this to theory in their reflection and assessments.

Participation in competitions

Links to the Mosaic: (3) Joint participation (staff, student and employers) in competitions (local/national) sharing ideas, resources and practice.

The students enter competitions, it improves their game and the world they are moving into (competition) thrives on this. [T4].

For many education programmes, competition is part of the culture (for example, Equine Management; Golf Management; Theatrical, Media and Special Effects Make-Up). Considerable collaboration goes into these competitive activities (working as a team, with or competing against employers and other student teams). The benefit for students participating in competitions is that they practice what they know to a competitive level and reflect on practice following the competition. This activity is supported through the scholarship of application where 'New intellectual understandings can arise of the very act of application' (Boyer, 1990, p.23). Furthermore, not only does this offer students and staff a platform for demonstrating excellence, competition also brings about problem solving (Boyd, 2013) and deep reflection, which fosters students professional growth (Nibert, 1996).

Communication between staff, students and employers

Links to the Mosaic: (4) Staff, student and employer forums

Staff, students and employers all use the same forum to keep in touch and share information. [T4].

Teacher 4, shared the practice of using a forum to communicate his programme by sharing news and information through a scholarly exchange of information, which links with Boyer's Scholarship of Integration, where different resources are shared. Handley (2016) considers that students communicate through social media on a daily basis and as a consequence, a forum is a useful tool for engaging students with employers.

With careful use of the site, collaboration could be enhanced with a scholarly knowledge-exchange of information and research (QAA, 2014b) which will enhance student employability and provide 'work ready' graduates (op. cit.) if students are not currently employed. Weller (2011) considers that scholarship is comprehensive and able to comprise of a wide range of purposes and so 'has the flexibility to accommodate new forms of practice' (2011, pp.1-13). Sharing knowledge supports the scholarship of application which again is where 'new intellectual understandings can arise out of the very act of application' and 'where theory and practice vitally interact ...' (Boyer, 1990, p.23).

Discussion and implications

While not a sector in its own right (Lea, 2015) CHE is seen as an increasingly important mechanism for developing the high-level skills needed by the local economy (ETF, 2016). Stakeholders in higher education also recognise that there needs to be an understanding and collaboration between higher education and the business sector (Leitch, 2006; HEFCE, 2006, 2016; HEA, 2011; QAA, 2014a, 2015b, 2016). Subsequently, as well as

furnishing industry with a highly skilled workforce, colleges should be developing a scholarly culture of knowledge-exchange, consultancy and work placement with employers (Simmons and Lea, 2013). EE, as our research has illustrated by the examples above, provides a means of this scholarly knowledge exchange development through state of the art resources being made available, problem solving skills learned and applied in the workplace, engagement in competitions and for involving employers, staff and students.

Higher vocational education covers levels 4–8 in CHE and is focused on supporting the needs of employers ‘technical and professional skills’ (BIS, 2015, p.21) which should be through shared objectives (Payne, 2007). As a consequence, it is recognised that students tend to be better prepared for the labour market if employers are also involved in programme design (BIS, 2015, p.21), and that employer engagement is used as a means of student enhancement (Bolden et al, 2010) even though the students might already be in employment.

Subsequently, there needs to be attention given to why EE is relatively weak in relation to the indicators used during the reconnaissance phase of the project, not only in this consortium of four colleges, but throughout the 46 partner colleges involved in this project. This could be due to the performativity culture of the college (Murray, 2012) which might not suit the employing organisation, who may be a small business with limited staff and financial resources. What’s more, the indicators might not suit the more technical culture of CHE and more importantly, there is the question of whether employers want to be tied in to a more academic engagement with colleges as suggested by an employer (Employer #1) who did not want the complication.

It is expected that exposure to the indicators and the reading required to understand whether identified EE activity is scholarly, will improve overall the quality of that engagement with employers.

Nonetheless, while the shift towards Degree Apprenticeships has increased, the business departments’ engagement with local industry and employers of higher education students and understanding of the further education culture (Lea, 2014; Smith, 2015), might lead to the premise that these relationships are unlikely to fulfil the expectation to be scholarly. Consequently, the role of employer engagement in CHE might need to be redefined to reflect the new realities of employer engagement (Boyer, 2016).

Currently, engagement with employers (outside of programmes validated for employers or the Degree Apprenticeship programme) is usually undertaken by individual teaching staff and is constantly changing: with each new student cohort, when a student changes employer or to support the curriculum needs of students, and this is costly to monitor. The question of what happens once the project finishes along with the SDM role, and the importance of capturing the scholarship identified in EE needs considering. Leonard, an SDM in another consortium, suggests that there is ‘a great hidden world of scholarship involving employers, which already exists and which needs people like us (SDM’s) to uncover so that we can learn, develop and grow it.’ (Leonard, 2016)

Programmes that are validated for a particular employer are well documented and might be looked after by staff in business development roles. This engagement is centrally collated but could be affected with limited financial resources (Mason, et al., 2010). Will collation of the wider range of employers be a priority when considering the financial impact of this strategy, and do these staff have the capacity to gather information from

a myriad of employers who do not necessarily connect with an individual programme in a significant way? Moreover, employers and the students and programmes they support are so disparate and in place for such limited periods, that there is the possibility that the relationship will be expensive and problematic to maintain if it is centralised.

Another matter is that of the teaching staff who are relying on their own expedients to work with employers, and who have developed these relationships through their own industry experience or over time, and most likely in their own time. Will they want to share this information initially and update the information periodically? Because literature suggests that this engagement usually becomes the responsibility of teaching staff to continue through 'good will', (Feather, 2011, p.20) although employer engagement is 'a critical government policy.' (HEFCE, 2009, p.60) Feather suggests that this strategy would only apply 'as long as there is funding to be had.' (Feather, 2011, p.20)

Lea and Simmons consider that CHE may have settled into a 'form of hybrid pedagogy' (2012, p.185) and Lea suggests that there are 'good grounds for depicting CHE as a form of hybrid ...' (2014, p.12) which needs to be considered given the myriad ways in which EE is undertaken. King and Widdowson suggest that 'the good practice found in further education is continued into higher-level study' (2012, p.14) which is where the EE on a programme validated for an employer stands. Conversely, Simmons and Lea consider that the culture of 'performance management' of further education might 'constrain the development of a thriving higher education culture' (2013, p.2) and the scholarly engagement reported here could suffer.

Indications are that CHE teaching staff have the opportunity to sit with the more university orientated 'what might be' (Lea and Simmons, 2012, p.182) form of knowledge with EE, which needs to be constantly researched, realigned and sustained. Therefore, EE will become fluid and innovative to meet the needs of the students, employers and that of industry (Williams, 2016). Should there then, in the case of employer engagement, be recognition of the hybridity of employer engagement that is pro bono publico but with the requirement of identifying the scholarship of each engagement?

While the subject of discussion is quality assessment, it could be recognised that with such diverse higher education provision in the sector there can no longer be a 'fit all' (HEFCE, 2016) position, and that innovative and creative provision is needed. Although this might be the case, employers play an important role in the students' development and need to be active in all aspects of CHE (QAA, 2016) which brings with it an institutional responsibility to collect data on who is involved, and make sure those engagements are robust. As a consequence, Davy's (2016) indicators which have been developed following years of experience, need to be shared with higher education staff, students and employers so that all parties have a working definition of practice to work towards.

Concluding thoughts

Our research has identified that programmes with good levels of engagement have either a teacher practitioner in place (who still works part time in industry), a teacher with recent industrial experience or adult students working full-time and studying part-time, who could be employers themselves and these relationships should be capitalised on.

It is good practice to keep information about employers centrally. This should include employers who offer work placement, employment, mentoring, use of their facilities or resources, and those who attend the college to either teach or attend meetings.

There is an expectation that it is employer influence over the institution's choice around the development of programmes (QAA, 2014a; QAA, 2015a) and this appears to be at its most active during validation. Low levels of employer involvement should be an experience of the past (BIS, 2011; AoC, 2015b) and while others write that there is strong employer support for CHE (QAA, 2014a; Eaton et al., 2015) findings suggest that unless EE becomes a teacher's responsibility, engagement tends to be superficial.

The responsibility that falls on teachers is probably because financial resources are too limited (Young, 2002) to employ dedicated business development staff to deal with this engagement. As suggested, findings demonstrate that in the case of a programme designed to support an individual employer's needs, staff are in place to develop and maintain this engagement (Brooks, 2016). However, with considerable evidence available that institutions should be engaging with all employers, which in turn enhances the institutional offer to students and employability, then it is recommended that a small funding stream to support these relationships should be put in place.

Technical CHE offers programmes that respond to an evolving industry. For example, Golf Management that needs high tech. equipment, Theatrical, Media and Special Effects Make-Up that needs state of the art resources, Construction courses that need computer aided design equipment and Internet Software Development programmes that need to keep students on a level with the industry they are moving into. Inevitably, with limited funding and resources in further education, colleges are unable to financially keep up with change. Employers are excellent sources of information. This is a valuable relationship which is currently maintained by the teacher who has robust contacts in industry, and this needs to be capitalised on by the institution.

EE (staff, students and employers) needs to reflect the higher education ethos by being scholarly in nature, so any EE activity needs mapping to ensure scholarship. The mosaic, which is not a fixed model, is flexible enough to extend (or retract) according to the needs of individual colleges, which will prove useful as long as it can be used with the requirement that methods of EE are tested for scholarship. Boyer's models of scholarship (1990) provides a dynamic model that has been adopted by others (Nibert, 1996; Boyd, 2013; Healey et al., 2014b; AoC, 2016) so could reasonably, through recontextualisation be used to support the hybrid form of CHE employer engagement.

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Biography

Jacqueline Brewer previously worked on Catalyst funded projects looking at leadership outdoors across the UK home nations Eire and Portugal and has lectured on Early Years in various institutions including college higher education (CHE) and higher education institutions (HEI). Currently Jacqueline is on secondment as a Scholarship Development Manager for the Association of Colleges (AoC) managing research for Higher Education Funding Council for England (HEFCE) Catalyst Funded Project: The Scholarship Project. Based at East Surrey College, Jacqueline is supporting a consortium of colleges undertaking research that will lead to The Scholarship Framework (forthcoming) which can be adopted by all CHE.

Promoting educational inclusivity in two groups of students through the use of discussion and discourse blogs: an example from International Business Studies

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Abstract

Two factors appear to influence learning of accounting subjects on the International Business degree at the University of Brighton. The first is '*linguistic confusion*'. Some students have English as their first language (E1L) while for others it is an additional language (EAL). Observation of first-year Financial and Management Accounting classes suggests that EAL students may have to make a greater 'learning leap' (Cousins, 2009) than their E1L peers because they misunderstand the lexis of accounting and finance. Particular problems are caused by '*false friends*' (terms which appear similar in other languages but actually have other meanings in English) and *cognates* (terms which have the same spelling and meaning in other languages). The second factor is '*conceptual confusion*'. This occurs because students have experienced a variety of mathematical pedagogies in their previous educational institutions. This paper is based on a research project that investigated the uses of peer learning through an online discussion board to address these issues and enhance learner inclusion.

Introduction

Some first-year Financial and Management Accounting students on the International Business degree at the University of Brighton have accounting subject knowledge from previous study, while others do not. Experience of teaching this module suggests that students often forget knowledge they have recently acquired because they encounter new concepts and information on a weekly basis. This is especially the case where students are studying accounting for the first time. Teaching time is limited, which restricts the amount of time available for concept checking, testing, review and development in class.

Like all academic subjects, Accounting has its own lexicon but it may be unusual in that very similar concepts can often be expressed by using very different terms. An example would be the use of near synonyms such as *income*, *sales revenue* and *turnover*. This appears to cause lexical confusion for EAL students in particular, and observation suggests it may often be this linguistic confusion that impedes learning rather than the concepts themselves.

Because Accounting subject knowledge and linguistic competence vary widely in even a small group of students, it was decided that the promotion of peer learning would en-

able students to share their conceptual and linguistic knowledge. It was also anticipated that students who were less confident would find peer learning using digital technology less daunting than asking questions of the teacher or their peers in class.

The International Business student cohort is multi-ethnic and multi-cultural, so developing modes of teaching and learning that ensure all students have an equal opportunity to learn and succeed can be challenging. Responding to this challenge requires us to recognise that the transformation of tertiary pedagogy is increasingly complex. (McLoughlin, 2001, p.7). In this regard, digital technologies can provide outward looking global-education as part of a system of 'borderless education' (Lauzon, 2000), whilst also providing us with opportunities to draw learners together as peer learners and thus enhance inclusivity.

Recent research (for example, Covil et al., 2013) has demonstrated the educational benefits of 'flipping the classroom'. Essentially the theory underpinning the practice is that students are provided in advance with the lecture content in the form of video recordings and face-to-face time is used for discussion, active learning and discourse around the topic in the video, which improves student engagement and knowledge. On the International Business course students already have access to video recordings of lectures, but this approach provides limited opportunities for lecturers to monitor engagement, understanding or conceptual challenges.

The flipped learning method enables students to study the content at their own pace and then further their understanding in face-to-face time via discussion or exercises; an inclusive practice that supports all learning styles, encouraging students to learn beyond the subject and take ownership of their own learning. The long term goal of this project is to introduce more flipped-learning opportunities on the International Business course.

Advances in technology have facilitated the flipped model of learning (Al-Seghayer, 2001; Lewalter, 2003; Fletcher and Tobias, 2005; Mayer, 2005; Jukes, McCain and Crockett, 2010). The increased availability of personal devices amongst the student population also brings opportunities to 'flip the classroom'. These devices can be used to enable live research on a topic and as an audience response tool, as well as facilitating the recording of discussion and discourse via blogs and discussion boards.

Methodology

The participants

The current first-year International Business cohort population comprises four seminar groups. The numbers for each group are detailed in Table 1, below.

Seminar groups	Number of students
IB1*	17
IB2	16
IB3*	14
IB4	12
Total number of students	59
Total number of IB1 and IB3	31

Table 1: Numbers of International Business (IB) students in the study

Group composition

Of the total population of 59 students, 43/59 (73 per cent) are E1L speakers while 16/59 (27 per cent) are EAL speakers. None have declared that they have studied Accounting before; 55 stated that they have not studied Accounting before and there are 2/59 (4 per cent) students who may have studied Accounting before as part of another course.

Two seminar groups of first year International Business Students containing both E1L and EAL speakers (IB1 and IB3 totalling 31 students) were invited to participate in this project as a purposive sample, which helps to achieve representativeness, enable comparisons to be made and focus on unique issues (Teddlie and Yu, 2007).

Early research

An initial group interview was held in January 2016 in order to determine levels of interest and potential engagement in the project. This model of data collection was chosen as it was 'time saving' (Cohen et al., 2011). It also allows for possible cross-checking whereby two (or more) versions of the same events can be collected, which in turn can lead to a more complete and reliable method (Arksey and Knight, 1999).

Group interview results showed that the target learners (IB1 and IB3) would welcome the idea of using peer learning through the use of an online discussion board to support their learning in their first year Managing Accounting and Finance module as they were finding the subject challenging. Furthermore, the target students agreed that the use of a blog or discussion board after each weekly seminar session would be useful as they were already using social media for peer learning (WhatsApp). The purposes of the discussion board were three-fold:

- 1 to check the understanding of accounting terminologies (especially given the many instances of synonyms/near synonyms for terms such as income, revenue and sales).
- 2 to provide a forum for comments and discussion about the key concepts of financial and management accounting, which would reinforce learning and act as an opportunity for the instructor to take remedial action at the beginning of the following sessions
- 3 to provide the opportunity for learners who may not engage with face-to-face communication to be 'included' in a different learning format.

Discussion boards

Two discussion boards (one for each seminar group) were set up at the beginning of semester 2, in February 2016. On a weekly basis, the tutor used this board to upload concept checking questions (to test subject knowledge) and vocabulary checking questions (to test inconsistencies of understanding of potentially confusing accounting lexis). Students were invited to discuss these questions in small groups through the medium of peer assisted learning. Uses of the Discussion Board were monitored on a weekly basis in order to identify any residual conceptual or linguistic areas for remedial action.

Ethics

Attempts were made to ensure that the discussion board was a safe online environment through the use of two documents: A statement of informed consent and 'netiquette' guidelines. Both were issued to students and uploaded onto the Business School virtual learning environment.

Post experiment action

A final group interview was held at the end of the Accounting input workshops in March, 2016. Cohen et al. (2011, p. 432) discuss the possible problem of 'groupthink' in group interviews, which 'discourages individuals who hold a different view from speaking out in front of the other group members'. In order to counter this, an additional online questionnaire was issued to allow personal feedback and to monitor engagement with the project.

Literature review

Using digital technology as a means of enhancing community

Lave and Wenger's seminal work on Communities of Practice (1991) views learning as a social phenomenon which results naturally from membership of a community. Active participation in the community becomes part of the learning experience, so that 'learning, thinking and knowing are relations among people engaged in activity' (p. 67). Among the participants in this study, online methods of delivery and interaction helped to promote social and learning activity within the community of practice

Hrastinski (2009) in Cheng et al. (2016), states that online learning and online participation are intricately interrelated. However, online participation can be a complex process of building and maintaining relationships with others to forge a community. Learner centred constructivism entrusts online educators to facilitate and foster students' collaboration, cognitive presence and interaction (Dunn et al., 2011; Palloff and Pratt, 2005; Salmon, 2000; 2011, in Jung-Ivannikova, 2016). Furthermore, Hrastinski (2009) concludes that learners will develop a stronger community when they interact and collaborate together. The aim of using discussion boards in this study was to enhance the level of attachment to the given learning community, and to increase the levels of participation for the chosen accounting module.

Palloff and Pratt (2005) state that this strong community can in turn promote online participation. In contrast, however, Kolb (1984), states that 'participation in learning occurs when students are involved in the processes of thinking and reflective observation.' This creates a chicken and egg conundrum i.e. does participation in a discussion board and peer learning through reflection on previously taught materials engender a sense of community or rather does a strong sense of community increase the levels of participation? This is an aspect which would benefit from further research.

Using online pedagogies as a means of enhancing inclusivity

McLoughin (2001) distinguished between culturally responsive views and traditional views of learning, and set up a series of continua to demonstrate key differences. Some of these are listed in Figure 1 (over) Her studies of online learning methods show that these can enhance cultural inclusivity as they offer access to diverse ideas and issues

Culturally responsive view	↔	Traditional view
Learning in a community	↔	Individualised learning
Focus on process	↔	Focus on product
Social orientation	↔	Behaviourist orientation
Teacher as coach and mentor	↔	Teacher as sage on stage

Figure 1. Key differences between culturally responsive and traditional views of learning (McLoughlin, 2001)

raised by the learners and teachers alike as part of a learning community. Parallels can be drawn with Vygotsky’s socio-cultural theory (1978), whereby learning is seen as a form of enculturation, in which the individual becomes socialised through gradual participation in tasks, scaffolded or assisted by ‘more capable others’ (in this case, peer students and the lecturer) until full competence is attained.

Barriers to effective online learning

Dunn et al. (2011) and Salmon (2000; 2011) discuss strategies and tactics for educators to encourage and foster communication in a virtual environment. In an evidenced-based account of communication challenges faced in a discussion on a virtual learning environment, Jung-Ivannikova (2016) reported that students had no problems using computer mediated communication (CMC) but did have difficulties expressing themselves in a written medium. Miscommunications, therefore, were found to be due to: learner attitudes; educational background and professional culture. In contrast, interestingly, Jung-Ivannikova (2016) found that online miscommunications were not due to national background or English language proficiency.

Collis, Parisi and Ligorio (1996, in McLoughlin, 2001) report on various barriers to effective online learning, including: problems of culture and the learning environment, problems relating to educational values and cultures; problems of language and semantics. A selection of these is discussed below.

Second language impacts on communication on discussion boards

Anxieties caused by language can be identified (Crookall and Oxford, 1992; Macintyre and Gardner, 1994). As several of the participants in this study are accessing the discussion board as EAL speakers, it is useful to consider the impacts of first/additional language use on online materials. While Jung-Ivannikova (2016) found that miscommunications on online courses were not due to national language background or English language proficiency, Horwitz (2010) found that anxieties were indeed caused by language and second language communication problems. Salmon et al. (2002) also pointed out that students with EAL experience difficulties expressing themselves and are disadvantaged in online communication.

Impacts on communication efficacy of using discussion boards

Jung-Ivannikova (2016) found specific impacts from using a discussion board, including a lack of non-verbal clues and low social presence. These ‘reality gaps’ affect student

participation and learning performance Picciano (2002) and Tu and Mclsaac (2002) are worthy of consideration in relation to this study.

Jung-Ivannikova (2016) stated that when considering the language used in VLEs, students develop their digital literacies through synchronous communication (like speech) and asynchronous communication (more akin to writing). Garrison (2011) says that this difference is key, as it affects the production and consumption of the utterances. Again, this is worthy of investigation in this study.

Frameworks for using digital technology for learning

Some useful guidelines for the uses of digital technologies for learning can be found in Salmon's well established framework (2011) for using CMC, which can be defined as communication which takes place between human beings via the instrumentality of computers. Other useful frameworks have been developed by Garrison and Anderson (2003) and Laurillard (2002). Frameworks specifically designed to help students to engage and work collaboratively are offered by Dunn et al. (2011) and Palloff and Pratt (2005).

Results and analysis

Of the 31 students in the study, eleven responded to the online survey (a response rate of 35 per cent). This has obvious impacts on the validity and reliability of the results. However, of the eleven students, nine said that they had engaged actively (by posting) or passively (by just reading) the threads. Two students said that they had forgotten to use the discussion board.

Five of the eleven respondents stated that using the board had improved their understanding of accounting concepts; five that it had improved their understanding of accounting terminology.

Several reasons were given for not engaging with the discussion board. Seven participants stated they would have engaged had participation been obligatory, six that they would have engaged if participation were assessed; five that they would have engaged had the sessions been face-to-face and two that they would have engaged, had participation been anonymous.

It can be a challenge to encourage students to take part in peer discussion of all forms; online discussions have their own challenges as was evidenced in this study. It should be noted that participation is not solely based on the written contribution to the discussion but that value can also be gained by simply reading the discussions (lurking). However, in terms of deeper learning, more is gained by making considered contributions to the discussions. Students can benefit in several ways: by participating in discussions initiated by other students; by seeking 'clarification from other students and finally by building a sense of a scholarly community' (Brown, 1997; Laurillard, 2002).

In this study, 55 per cent of participants thought assessment would have been a motivator. Evidence from other projects at the University of Brighton suggests that in fact this is an initial motivator, and once engaged the students better understand the benefits of participation.

Summative assessment of online discussion is a way of improving engagement in the activity (Macdonald, 2003). According to Swan et al. (2007) 'to encourage online discussion one must grade it, and discussion grades must count for a significant portion of final course grades' (pp. 47-48).

With reference to learner motivation, Klemm (2000) suggests that the goals and purpose of the forum should be stated and clearly explained, feedback should be provided, and students should know that the forum is monitored. In addition, input should be rewarded, negative feedback should be avoided and communities should be developed in order to avoid lurking and improve true participation.

Cheng et al. (2016, p.267) looked at average frequency of participation in each on-line activity per student. They found that online participation in networked learning and materials development is significantly correlated with learning achievement and course satisfaction. How can this participation be measured? Cheng et al. (ibid p.216) state that 'the act of talking or writing in online discussion forums is often regarded as an indicator of online participation'. If the use of an online tool such as a discussion board promotes feelings of community membership, perhaps the participation should be encouraged at the outset of the course, rather than at the beginning of semester two?

Conclusion and recommendations

In conclusion, in order to encourage participation, it would appear that it would be useful to make use of the discussion board obligatory (with a grade for engagement/contribution); or to assess use in some way (perhaps through a minimum number of contributions, or through an assessment of the value of the contributions made).

Three factors appear to have a significant influence on this method of learning: the timing of the start of the activity; training in the use of the technology and discussions around the value perceptions of the discussion boards. Some students found it difficult to use the technology, so perhaps longer training was required. Furthermore, some learners had already set up informal WhatsApp groups in order to fulfil the same conceptual/language based discussions formally, and saw little value in adding a new system to their means of communicating and discussing course content with each other.

Some investigation and discussion needs to take place into the amount and form of tutor engagement (if any) on the discussion boards. The literature suggests that learner and tutor engagement can be very valuable, but ensuring that students use the university based digital technology is potentially problematic.

Further investigation needs to take place into the ways in which these learners enjoy engaging with social media of this type. Cheng (2016) states that 'networked learning requires social interaction among students through comments about and references to each other's work and ideas.' It is this which will form the basis for our further research during the next academic year.

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Biographies

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