



University of Brighton



— ***Research Matters*** —

Articles from the Pedagogic Research Conference 2018

— *Research Matters* —
Articles from the Pedagogic Research Conference 2018

Eds: Rachel Masika
Adrian Chown



University of Brighton

Published by Centre for Learning and Teaching
University of Brighton Press

First edition published 2019

© University of Brighton

ISBN: 978-1-910172-20-9

Available online at:

[https://staff.brighton.ac.uk/clt/
Pages/Research/publications.aspx](https://staff.brighton.ac.uk/clt/Pages/Research/publications.aspx)

CLT Publications
Managing Editor: Lynda Marshall
Centre for Learning and Teaching
104 Watson House
University of Brighton
Village Way
Falmer
Brighton BN1 9PH

Tel: 01273-644767

Email: l.marshall2@brighton.ac.uk

Contents

Editorial introduction

Research matters: framing and situating pedagogic research Dr Rachel Masika and Dr Adrian Chown Centre for Learning and Teaching	6
---	---

Keynote

From pedagogic innovation to publication: resituating your pedagogic research Dr Kathleen M. Quinlan, University of Kent	11
--	----

Articles

Diagramming wrongly: bridging theory and practice with 'indisciplined' diagramming Paul Grivell and Claire Scanlon Northbrook Metropolitan College	21
---	----

Can fidgeting be used to measure student engagement in online learning tasks? Dr Harry Witchel, Brighton and Sussex Medical School (BSMS); Dr Carina E. I. Westling, University of Sussex; Julian Tee, Thomas T. Ranji, (BSMS); Rob Needham, Dr Aoife Healey, Staffordshire University (SU); Carlos P. Santos, Dr K. James Ackah, Joe Chalkley, BSMS and Professor Nachiappan Chockalingam, (SU)	39
---	----

Navigating learning during the first years at university for direct entry students Dr Gillian Teideman, School of Sport and Service Management	49
--	----

Using interprofessional learning to develop professional understanding: the example of occupational therapy and physiotherapy Dr Hazel Horobin and Sue Wheatley, School of Health Sciences	63
--	----

Research matters: framing and situating pedagogic research

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

Abstract

This editorial introduction frames the articles from the pedagogic research conference 2018 by highlighting the broader context in which pedagogic research operates, the opportunities, contested space and tensions as well as its multi-disciplinary nature. While pedagogic researchers use a range of theories, methods and methodologies, a common feature is the commitment to improve understanding and practices of learning and teaching. This diversity in approach is demonstrated by the different foci of the papers in this publication. The articles focus on enquiry that aims to better understand students' learning, engagement, experiences and outcomes, or considerations for the translation of these kinds of enquiry into articles in peer-reviewed journals for wider learning.

Introduction

In a complex socio-political-economic academic context, pedagogic research and innovation are considered as contributing to solutions to teaching, learning and academic development challenges faced by universities. For example, Cartney (2015, p. 1,148) argues that 'pedagogic research offers opportunities to explore 'what works' in localised contexts and also to simultaneously raise issues of concern expressed by teachers and students - what doesn't work - placing all of these issues for debate within the broader academic community'. While Cartney makes the case for the opportunities pedagogic research presents for universities, she also acknowledges the contested space in which pedagogic research is undertaken and the tensions. Cartney (2015) has argued that pedagogic research exists and operates in both philosophically and economically contested spaces around what the role of universities is in contemporary times. Longer standing tensions of an unequal relationship between teaching and research and methodological/conceptual critiques of pedagogic research as a field of study are brought into sharper focus. Questions also arise about the relationship of pedagogic research and the consumerist/corporatist agendas taken on by universities. Such contextual issues warrant a brief revisiting of what pedagogic research entails in contested spaces.

Pedagogic research is sometimes referred to as 'educational enquiry', and is closely associated with *the scholarship of teaching and learning*, (Cleaver et al., 2018). Pedagogic research is not just undertaken by specialist academics and researchers in higher education departments or centres, but also encapsulates disciplinary research in education undertaken by, for example, sociologists, psychologists, doctors, engineers,

artists, architects, economists, philosophers and historians (Griffiths, 2004; Brown and Edmunds, 2011; D'Andrea and Gosling, 2003; Grove and Overton, 2013; Haigh et al., 2015; Tight, 2013). It is a multi-disciplinary endeavour in which researchers use a wide range of theoretical perspectives and methodological approaches to understand and improve teaching and learning practices in their respective disciplines. This diversity of approach has raised questions about the distinctiveness of pedagogic research methods and methodology (Stierer and Antoniou, 2004; Tight, 2013). Stierer and Antoniou (2004, p. 275) suggest that 'the main defining feature of methodologies for pedagogic research in higher education is their diversity, and the opportunities they offer to combine conventional educational research methodologies with higher education teachers' disciplinary expertise and understandings'. Because the methods of enquiry, reporting styles and publication outlets chosen by practitioners tend to be characterised by their parent discipline they can be eclectic and pragmatic, but there is a common primary intention to improve pedagogic practice or advance pedagogic knowledge (Bassey, 1983). Pedagogic researchers see their efforts as steps towards the construction of a body of pedagogic propositions from which more effective teaching strategies can be developed (Wagner, 1990).

Contemporary pedagogic research raises three concerns: the extent to which research and teaching is integrated (Anwaruddin, 2015), the under-representation of pedagogic research in the Research Excellence Framework (REF) (Cotton et al., 2018) and where pedagogic research might focus to support students' education in a REF-TEF world (Kneale, 2018). Given the complex and contested spaces of higher education, pedagogic research can provide pointers, raise issues for consideration, and encourage professional reflexivity, albeit not necessarily providing all the answers (Cartney, 2015). One way of being part of this conversation is by disseminating findings of these educational enquiries for debate or considerations in improving teaching and learning practice. This requires translating research into publications and the integration of research and teaching through practice. While the translation/integration of research and teaching can provide ways of enhancing student learning experience, publicly communicating these links can be complex and challenging, given different practices of research-based education and research-informed teaching.

The articles

Our keynote addresses the challenges faced in translating pedagogical research on practical challenges of teaching and learning into peer reviewed publications. **Dr Kathleen Quinlan** offers valuable advice and guidance regarding the ways in which pedagogical literature and theories of learning, teaching, motivation and curriculum can be used to frame local problems and questions so that they appeal to a wider audience. Drawing on her experiences as a reviewer for higher education journals and conversations with editors of two journals in the field, Quinlan presents three tips for moving from individual innovation and personal inquiry to publication.

First, it is important to frame pedagogical research problems in ways that are recognised beyond the researcher's immediate context so that innovations and lessons for teaching enhancement can be shared across the academic community. Second, the problems encountered in practice should be considered within a theoretical framework. Whether theory is regarded as interrelated concepts and assumptions or as a visual

representation that explains the key factors or variables to be studied, it plays in an important role in stimulating and guiding the further development of knowledge and in generating explanations. Third, it is helpful to think beyond evaluation designs, to enable going from the particular to allow consideration for more general mechanisms. In sum, moving from pedagogic research that focuses on one's teaching to publishing for a wide audience requires that the pedagogic research question is framed in terms that are recognisable to others.

Diagrammatic practices offer invaluable means for students in diverse disciplines to think through their own ideas and understandings, and those of others. **Paul Grivell** and **Claire Scanlon** present action research exploring the use of diagramming in higher education Art and Design. They seek to develop a praxis and present findings of their action research designed to develop productive and meaningful ways of engaging students in critical, theoretical ideas that inform and integrate with their visual practice. Some students develop a strong resistance to traditional presentations of theory, which can disengage them from some forms of learning. However, in many disciplines (for example geography, linguistics, marketing, architecture, psychology, education, economics, physics and semiotics) key processes and concepts are communicated in diagrams. Evoking the work of artists from the field of artistic research, Grivell and Scanlon describe how they creatively mix approaches adopted in diverse disciplines to develop 'indisciplined' diagrammatic forms that stimulate new insights and understanding.

Dr Harry Witchel et al., explore the measurement of student engagement in the context of human-computer interaction through the level of fidgeting that occurs. The study provides a description and analysis of student engagement in relation to instrumental and non-instrumental inhibition. Movement is proposed as a proxy for engagement and data are presented to illustrate that 'students engage in different ways' which 'often do not match the narrow vision of engagement held by classroom teachers and espoused in existing research literature'. For example, proximity (mean distance to screen) has often been regarded as a measure of engagement. However, the study suggests that non-instrumental movement inhibition, embodied in fidgeting, is associated with engagement and not proximity. This has implications for understanding engagement in order to inform pedagogic theory and practice.

The learning experiences of first year, direct-entry undergraduate Physical Education students are the focus of **Dr Gillian Teideman's** study. Reflecting the complexities of the transition, her research illustrates the interconnected cognitive, affective and social dimensions of learning. The mediational influences of perceptions of self are considered in relation to decision-making, orientation towards or away from opportunities, and the regulation of emotions and action. Different ways of 'becoming' or going about learning are presented that involve learning to control and manipulate the environment. Insights into the dynamic positionings of students as they develop understanding and become increasingly involved as members of a community of practice are elucidated with an argument that belonging needs to be regarded as a continuum that also considers not belonging. The interdependence of motivation and effect are also considered. Teideman also presents examples of good practice that include practical pedagogies adapted for use in a lecture theatre, opportunities for collaboration, time to practise, embed and apply knowledge alongside timely and meaningful feedback.

Dr Hazel Horobin and **Sue Wheatley** argue that interprofessional learning events can help students to better understand the need for professional collaboration in contemporary working practices, and to practise their own collaborative abilities. In their evaluation of an interprofessional learning event involving occupational therapists and physiotherapists, they consider the planning, implementation and structure of the sessions as well as staff and student evaluative feedback. The ability of students to work in teams and across professional boundaries is a central theme and it is emphasised that students need to be made aware of this at an early stage of their learning. This evaluative enquiry suggests that interprofessional learning events can foster links between lecturers and students from different professions, promoting their ability to work in multi-professional teams and across professional boundaries.

Conclusion

The articles presented reflect pedagogic researchers' primary aim of improving practice and advancing pedagogic knowledge (Bassey, 1983), making visible some of the challenges of teaching and learning, and the opportunities for enhancement. The diversity of the issues to which they attend exemplify the richness of pedagogic research conducted within the contested spaces of higher education. While they do not provide all the answers to the challenges to which pedagogic research attends and tensions inherent in the context in which it operates, each in their own way advances the conversation about particular aspects of learning and teaching and share thoughts for enhancements to improve students' experiences.

Bibliography

- Anwaruddin, S.M. (2015) Teachers' Engagement with Educational Research: Toward a Conceptual Framework for Locally-Based Interpretive Communities. *Education policy analysis archives*, vol. 23, no. 40.
- Bassey, M. (1983) 'Pedagogic Research into Singularities: case-studies, probes and curriculum innovations'. *Oxford Review of Education* 9, pp. 109–121.
- Brown, G., Edmunds, S. (2011) *Doing pedagogical research in engineering*. Loughborough: Engineering Centre for Excellence in Teaching and Learning.
- Cartney, P. (2015) 'Researching pedagogy in a contested space'. *British Journal of Social Work*, 45, pp. 1137–1154.
- Cleaver, E., Lintern, M. and McLinden, M. (2018) *Teaching and learning in higher education: Disciplinary approaches to educational enquiry*. Sage.
- Cotton, D., Miller, W. and Kneale, P. (2018) 'The Cinderella of academia: Is higher education pedagogic research undervalued in UK research assessment?' *Studies in Higher Education*, 43, 1625–1636.
- D'Andrea, V.-M., Gosling, D. (2003) Promoting research in teaching and learning in higher education: two case studies of multi-disciplinary pedagogic research.
- Griffiths, R. (2004) 'Knowledge production and the research–teaching nexus: The case of the built environment disciplines'. *Studies in Higher education*, 29, pp. 709–726.
- Grove, M. and Overton, T. (2013) *Getting Started in Pedagogic Research within the STEM Disciplines*. University of Birmingham.

- Haigh, M., Cotton, D. and Hall, T. (2015) 'Pedagogic research in geography higher education'. *Journal of Higher Education*, vol. 39, no. 3. pp 299-312.
- Kneale, P. E. (2018) 'Where might pedagogic research focus to support students' education in a REF-TEF world'. *Journal of Geography in Higher Education*, pp. 1-11.
- Stierer, B. and Antoniou, M. (2004) 'Are there distinctive methodologies for pedagogic research in higher education?' *Teaching in Higher Education*, 9, pp. 275-285.
- Tight, M. (2013) 'Discipline and methodology in higher education research. *Higher Education Research and Development*, 32, pp. 136-151.
- Wagner, J. (1990) 'Bricolage and Teachers' Theorizing'. *Anthropology and education quarterly* 21, pp. 78-81.

Biographies

Dr Rachel Masika is a Senior Research Fellow in the Centre of Learning and Teaching at the University of Brighton. She co-chairs the organising committee of the annual pedagogic research conference, 'Enhancing Higher Education Through Research' and co-edits *Research Matters*. Her main research interests relate to equity and inclusivity in higher education. She is currently researching rural students' transitions into and through higher education in South Africa, and is involved in an institutional project evaluating process and experiences related to curriculum design initiatives.

Dr Adrian Chown at the time of writing was a Senior Lecturer in educational and professional development at the Centre of Learning and Teaching at the University of Brighton and co-chair of the annual pedagogic research conference. He also co-edited *Research Matters*. His main research interest is the work and learning of academic staff, and the development of socio-cultural perspectives on professional learning.

From pedagogic innovation to publication: resituating your pedagogic research

DR KATHLEEN M. QUINLAN, UNIVERSITY OF KENT

Abstract

This article explores the most common difficulties faced in translating classroom research on practical problems of teaching and learning into peer reviewed published outputs. Using examples from my own research, I will show how to use pedagogical literature and theories of learning, teaching, motivation or curriculum, to frame local problems and questions to appeal to a wider audience. This essay is based on my keynote at the University of Brighton's Enhancing Higher Education through Research Conference on 2, February, 2018.

Keywords: Theory, higher education, scholarship of teaching and learning (SoTL), classroom research, pedagogical research.

Introduction

There is a growing interest in researching one's own teaching practice as part of a larger movement called 'the scholarship of teaching and learning' (SoTL). This movement can be traced back to Ernest Boyer's reconsideration of scholarship and the varied duties of academics (Boyer, 1990). According to Boyer, scholarship means: 'stepping back from one's investigation, looking for connections, building bridges between theory and practice, and communicating one's knowledge effectively ... Specifically, we conclude that the work of the professoriate might be thought of as having four separate, yet overlapping, functions. These are: the scholarship of discovery; the scholarship of integration; the scholarship of application; and the scholarship of teaching'. (Boyer, 1990, p. 16).

Teaching portfolios (Edgerton, Hutchings and Quinlan, 1991) and, later, course portfolios (Hutchings, 1998) were developed as ways that university teachers could 'step back' and 'look for connections'. Lee Shulman (1993) expanded on these ideas, emphasising that scholarship takes place within a community of scholars. Teaching, like research, needs to be made 'community property' by opening it up for peer review within the disciplinary communities that are central to academic identities and work.

Over time, journals have been established in which the results of teachers' own pedagogical inquiry can be published, such as the *International Journal of the Scholarship of Teaching and Learning* (IJSOTL), *Teaching and Learning Inquiry* (the journal of the International Society for the Scholarship of Learning and Teaching) and *Higher Education Pedagogies* (a journal of the UK's Higher Education Academy). These journals are anchored in a conception of the scholarship of teaching (SoTL) as inquiry aimed at improving students' learning (Huber and Morreale, 2002). They cross disciplines and embrace a variety of research methodologies.

Consistent with Shulman's (1993) arguments for embedding the scholarship of teaching within existing disciplinary communities, much pedagogical inquiry is also published in discipline-specific pedagogical journals such as *Chemistry Education Research and Practice*, *Advances in Health Sciences Education*, the *Journal of Accounting Education*, the *Journal of Geography in Higher Education*, *Teaching Sociology* and so on. Various lists of journals that publish pedagogical research can be found on the web¹. While there has been an increase in quantity of discipline-specific pedagogical research, work remains to improve the quality of this research (Quinlan et al., 2013; Chick and Gurung, 2009).

Researching your teaching, then, is a commitment to enhancing your own teaching and your own students' learning through a process of scholarly inquiry. It enables you to step back from and take a fresh perspective on your teaching and your students' learning. Thus it promotes both your own learning as teachers and your students' learning through the development and testing of various pedagogical approaches. Through institutional teaching and learning conferences and pedagogical research conferences, we can share our innovations, the lessons we have learned about our students, and how to best teach them. Doing so allows us to influence practice beyond our own classroom through a university-wide community of scholars.

This essay is intended to help you take the next step by presenting and publishing your research beyond the institution, thereby advancing the field of teaching and learning in higher education – in your own field and beyond. Thus, it allows you to contribute to a larger community of scholars to enhance practice – and student learning – around the world.

I am going to discuss three main 'tips' in moving from individual innovation and personal inquiry to publication. These recommendations are based on conversations with editors of two journals in the field: *Teaching in Higher Education* and *Advances in Health Sciences Education*, and my own experience as a reviewer for various higher education journals. First, the 'desk rejection' rate for these journals is notable. Some 50 per cent of papers submitted to these journals do not make it past the editor; they are not even sent out for peer review. The main difficulty at this stage is in how the research is framed and situated. Thus, I concentrate here on how to write a convincing introduction, drawing on examples from my own research to illustrate three key principles.

Principle 1: Frame the problem in ways that will be recognised beyond your immediate context

In pedagogical research, we usually start with the local and the specific. It is tempting to start our papers with this local context, along the lines of, 'At Cow Crossing University, we had a problem with A, so we tried B. We evaluated it using C'. The problem with this introduction is that the reader doesn't care about Cow Crossing University or the problems the writer is having there. Worse than that, the reader may know something about Cow Crossing University, such as differences in the student body, that will cause them to dismiss your findings.

1 For example: <http://pod.nku.edu/sotldisc.asp>.
<http://researchguides.library.vanderbilt.edu/c.php?g=69093&p=446509> and
<https://teaching.uncc.edu/learning-resources/sotl/sotl-journals>.

Instead, you need to state the problem your paper addresses in a way that readers will think: 'Oh, yes, I recognise that problem!' You need to become familiar with the literature so that you can be sure your problem is actually a more widely-shared problem, and know what others have done or tried to address this problem. So let's look at an example from one of my own published studies (Quinlan, 2000). Now, let me be clear: this isn't a 4* paper we're talking about! I present it precisely because it is a modest example parallel to that which many of you face. The process by which it arose is essentially exactly the formula expressed above, in that my colleagues and I faced a particular problem in a particular curriculum in a particular setting.

Basically, at the Cornell Veterinary College, students in our problem-based learning (PBL) curriculum complained that it was too difficult to find high quality articles to inform the independent study phase of their learning. Faculty members also complained about what students came back to sessions with when left on their own with Medline searches. So, we set up a literature database to support particular students and sought student feedback on it. So, let's look at how that example was re-written.

'Students and faculty often find the shift from a traditional curriculum to a PBL curriculum difficult. In a PBL curriculum, students' learning is prompted by and situated in real world problems encountered in the profession. Problem based learning is structured to help students: 1) learn important principles and key concepts; 2) develop their problem solving skills (the clinical reasoning process in particular), and 3) learn how to direct and manage their own learning (Barrows and Tamblyn, 1980; Barrows, 1988; Schmidt, 1993). The success of a PBL curriculum depends upon students taking responsibility for their own learning. Students, like professionals in the field, are expected to prioritise what they need to learn ('learning issues'), make choices about the resources they will consult, work collaboratively with colleagues, and organise their efforts to address learning issues in sufficient depth'. (Quinlan, 2000, p. 1).

In this opening paragraph, I have framed it as a challenge in teaching in a PBL curriculum, not just at Cornell's Veterinary College. Anyone who is using PBL may be interested in this paper. Regardless of whether they are teaching medical students or undergraduate geology students or teaching in the US or the UK, they will also have students who have struggled to transition to the new demands of a PBL curriculum.

In that introduction, I have gone on to frame it in terms of the goals of PBL. In doing so, other teachers who do not necessarily teach using PBL might resonate with the problem. Many educators want students to be able to do those three things. Maybe I have captured more readers this way. Many teachers will know that students have difficulty in directing their own learning, whether PBL or some other type of curriculum. In the next paragraph I elaborate the problem of transition mentioned in the opening sentence, citing a key study that illustrates that it isn't just Cornell students who have this problem. You will cite more than this, but I did say this is a modest example!

'It can be particularly challenging for students to develop skill and confidence in directing their own learning. Among the difficulties students experience with this transition are the demands of selecting appropriate literature to address their learning issues. In a study of students enrolled in a PBL physi-

otherapy program, Solomon and Finch (1998) identified 10 stressors that were described by at least one quarter of the students in a reflective journal kept during the first semester of their program. 'Search stress': difficulty with finding appropriate literature and inordinate amounts of time spent searching rather than studying was mentioned by almost one third of their students'. (Quinlan, 2000, p. 1).

I then showed that this isn't just a problem for students, but a dilemma for teachers to which teachers must find a resolution:

'Faculty, too, may find it frustrating to watch students struggling and still missing valuable resources. On the one hand, educators wish to encourage self-directed learning, in keeping with a core philosophy and purpose of PBL. On the other hand, if students are spending disproportionate time and energy trying to find helpful literature or end up missing key references altogether, it can compromise another core goal of PBL that students learn the scientific principles underlying the case or problem'. (Quinlan, 2000, p. 1).

In sum, your first job in your introduction is to identify a shared problem and why it is important for people beyond your context. If the problem you are identifying is particular to, or particularly important to those in your discipline, then you may want to publish in a discipline-specific journal. In this case, I felt it wasn't just a problem for veterinary or even medical educators. Thus, I chose a journal that was addressed to a variety of disciplines. The title, though, means it is still only likely to attract those who teach using PBL, although the problem and its solution might be useful more broadly.

Principle 2: Frame the problem theoretically

I can hear the groans when I mention theory. I know many new teachers struggle to connect educational theory with practice. But we are all theorists! You have some implicit ideas and hypotheses. Often these are tacit. By discussing your problem and the solutions you think might work with others, you may be able to make those implicit assumptions more explicit. In the context of reflective practice, Brookfield (1995) calls this process 'assumption-hunting'. Once you start pulling out your hypotheses, they can be matched to a published, established theory.

A theory is simply 'a set of interrelated concepts, definitions, assumptions, and generalizations that systematically describes and explains regularities in behaviour in educational organizations'. (Hoy and Adams, 2016, p. 3). Thus, first, theory is composed of 'concepts, definitions, assumptions, and generalizations'. Second, the major function of theory is to describe and explain. The 'theory' I used with the evaluation of the literature database was the theory of PBL, which is encapsulated in its three canonical goals. The assumption is that these three goals guide curricular and instructional design within PBL. Thus, just as problems arise in trying to balance those goals, so solutions should also balance those goals. This is quite 'light-touch' theory, which I described as a 'framework' for the study. Nonetheless, these goals certainly constitute a set of inter-related assumptions that systematically define PBL, thereby explaining common features of that type of curriculum.

Let's consider another definition. A theory is a written or visual presentation that, 'explains either graphically, or in narrative form, the main things to be studied, the key

factors, concepts or variables, and the presumed relationship among them' (Miles and Huberman, 1994, p. 18). Here we see that theory stimulates and guides the further development of knowledge. In the example (Quinlan, 2000), the theory helped frame the research questions. A searchable bibliographic database of articles was created to 'strike the right balance so that students are both accessing the literature that will help them learn the subject matter and developing their self-directed learning skills' (Quinlan, 2000, p. 1) by requiring that they search for and make choices about what to read. Key research questions that guided the design of a student survey were: 'How is the database rated in terms of its usefulness in addressing learning issues? What impact does the database have on students' self-directed learning and 'search stress?'

Theories are, by nature, general and abstract. (Indeed, it is the very abstraction that new teachers may not like when they are struggling to solve concrete, practical problems in their own contexts). Theories are not strictly true or false, rather they are either useful or not useful. They are useful to the extent that they generate explanations that help us understand. Typically hypotheses are derived from the theory to predict particular relations among the concepts. When hypotheses receive overwhelming empirical support, the accepted hypotheses become principles.

Let's turn to another example, drawn from a study of the challenges of designing interdisciplinary postgraduate curricula in which my student and I investigated two case studies of master's degree programmes (Gantogtokh and Quinlan, 2017). We started by explaining that there is a movement within higher education toward interdisciplinary educational programmes to respond to complex real world problems, followed by a few examples that demonstrate that the world has lots of problems, so educators are building various educational programmes to try to address those problems.

Then we state the pedagogical problem that it is intellectually challenging to design coherent interdisciplinary curricula because of the need to integrate multiple bodies of knowledge while promoting students' higher order thinking and problem solving. We hung the paper on this key assertion. Again, we think many people beyond the two case study programmes that we examined will recognise this problem.

Then we needed to define some terms, and here we became more theoretical. In the introduction we had several paragraphs of definitions of interdisciplinarity, which meant we had to define disciplines. The reviewers insisted that we do so because they thought (hypothesised) that the particular disciplines we were combining would affect how hard it was to build a coherent curriculum. That hypothesis is a fair proposition. Biology and chemistry are easier to put together in a health sciences programme than trying to put, say, humanities and sciences together where people don't share methods, language, writing style or world views. Then we needed to focus the study, which meant developing, in effect, a theory of curricular coherence. We wrote:

'Combining Stark (1986) and Knight's (2001) work, we have developed a framework of four elements of coherence-building interdisciplinary curricula that we investigate in these studies: (1) logical connection-making across different courses through structuring and sequencing; (2) integrative learning, occurring through teaching and learning processes such as those DeZure (2010) suggested; (3) assessment, evaluation, and adjustment; and (4) collaborative community and environment, which provide favourable conditions for coherence-building'. (Gantogtokh and Quinlan, 2017, p. 571).

We used this four-part framework to develop the protocols for interviews with course designers and then to structure the reporting and discussion of the results, allowing us to summarise solutions to challenges of coherence-building under these four headings. Ultimately, the paper implicitly generated propositions about causes and effects; if one attends to these four elements, using these kinds of solutions, one will be more likely to create a coherent curriculum. These propositions can be illustrated in graphic form instead of written form, using boxes and arrows connecting the key constructs.

Finally, we can think of theory as ‘a way of *seeing* or characterising a research object ... seeing the object of empirical research in a particular way and *not in other ways*’ (Ashwin, 2012). To illustrate, let’s consider work-based learning. At one level, we could think about what is happening in the minds of the students during work-based learning. A medical educator colleague applied self-regulated learning theory (Zimmerman, 2002) to redesign a busy clinic. The basic model of self-regulated learning is that students go through three main phases of thinking and metacognition (thinking about their own thinking) during the learning process. The first phase is a planning phase in which learners analyse the task at hand, set goals and develop strategies for addressing those goals. The second main phase is performance, when they are actually doing the learning task and must exercise self-control and self-observation, applying certain strategies, observing themselves and the success of what they are doing, and making mid-course corrections. The last phase is self-reflective and should feedforward to the next cycle.

My colleague was running a busy clinic in which she was under considerable pressure to see many patients quickly. Yet, she also had medical students who were trying to learn from the experience. She needed students to regulate their own learning because she didn’t have much time to attend to them. So, she asked them what their goals were for the session and agreed particular strategies for them to achieve those goals. One student might have wanted to practice his physical exam techniques, so she gave him guidance about what to observe. During the afternoon, this teacher provided space for him to perform and then facilitated a short reflective discussion at the end of the afternoon, starting with his self-assessment. The student met his specific goal and explicitly practiced self-regulation while my colleague was able to meet her goals of running an ‘on-time’ clinic while also providing good quality educational supervision. Self-regulated learning helps us to shine a spotlight on what the student is doing mentally in that workplace learning situation. A research study might investigate how the student analyses the task at the beginning, the goals they set or the procedures they use to self-monitor. We might, for example, do a think-aloud protocol using the student’s notebook from the afternoon as a prompt. This model is an appealing one for work-based learning insofar as it focuses us on helping students to manage their own learning. However, every theory obscures other aspects of the learning phenomenon.

A different theory can help us to ‘see’ the situation differently. We might, instead, apply Lave and Wenger’s (1991) Communities of Practice model (CoP). While Self regulated learning (SRL) is a psychological model, CoP is an anthropological theory. It views learning not as something that happens inside an individual’s head, but as a social process. It sees learning as a process of developing an identity through participation in particular ‘communities of practice’. Apprentices in this community move from the periphery (students watching from the sidelines) to the centre (for example, the surgeon in the operating theatre). The key is that the newcomers need to be engaged in ‘legitimate’

peripheral participation. In other words, they need to be engaged in activities that are authentic to the professional or disciplinary practice. Asking them to sweep up after the surgeon has gone home is a form of participation, but does not engage them in the 'legitimate' (authentic) tasks of the surgeon. Asking them to scrub and gown and enter the theatre during the procedure, allows them to practice the necessary sterile procedures required in the operating theatre, and allows them to begin to try out the role of doctors through participation in key professional rituals.

If we look at a work-based learning scenario through a community of practice lens, we will ask ourselves different questions, which shapes our research differently. We might ask about the norms and hierarchies within the community, how those are communicated and symbolised and where students fit into those patterns. We might study the way spaces are arranged, who sits where, how they dress and are addressed, and how all those elements of the situation affect different participants' access to the central activity or sense of identity. We might consider how medical students interact with each other and with other parts of this community, such as nurses and receptionists. We might research these questions through ethnographic observation. Thus, the theory we choose shapes our hypotheses about what supports learning, the questions we ask, the methods we use, the way we analyse the data, and the conclusions we draw. Looking at the same learning situation through different theories has led us to 'seeing the object of empirical research in a particular way and *not in other ways*' (Ashwin, 2012, p. 943).

Principle 3: Think beyond evaluation designs

As teachers, we often want to know whether a given instructional strategy is better than another. This is an evaluative question. We might broaden that question to 'how effectively is a given instructional intervention or strategy working?' which is the form that my evaluation of a literature database (Quinlan, 2000) took. That evaluation examined feedback from students. A variation on that format involves an analysis of students' work to determine how well they are learning as the result of an instructional intervention. For example, in another study, my colleagues and I developed a rubric of discipline-specific writing criteria to analyse student work over the course of a term, to better understand how students' medical writing developed through practice and weekly feedback (Rawson et al., 2005).

We can expand our questions, though, to other kinds of research (Dolan 2007). We might ask questions about what and how things are happening. For instance, there are many opportunities to explore how students understand a given concept in your discipline, what is difficult about it, how they engage with or understand the demands of a given task, and how the process of engaging with that task affects their understanding of some concept or process that is central to your discipline. A more recent example of my research (Quinlan et al., 2012), still a modest one, illustrates this approach. In that study, we sought to understand what the general thresholds (Meyer and Land, 2005) were in students' learning of engineering during their first year of study. Then we investigated what made Mohr's Circle, a particularly troublesome technique in the discipline, hard for students to understand. We used the case of Mohr's Circle as an illustration of the more general difficulty of connecting mathematical representations to physical phenomenon. We analysed student interviews, teacher interviews and textbook representations of this issue, to show how difficulties with Mohr's Circle are linked to a failure to

understand the concept of stress, which involves both force and area and calculations rooted in trigonometry. The aim was to create a foundation for more effective teaching approaches by unpicking what is difficult about a given technique and related concepts.

Finally, we might ask questions about the mechanisms. Why is something happening? As I have become more aware of the importance of theory myself, my research more explicitly looks for underlying explanations of phenomena. For instance, in a current research project (Quinlan, under review) I want to understand what triggers students' interest in lectures. One can look at this at a specific level through qualitative data, immersed in the particulars of the lecture. For example, students became interested in a psychology lecture on attachment theory when the lecturer animatedly told a story about her two dogs' differing behaviours, illustrating insecure versus secure attachment. Knowing that this moment was particularly interesting to students is useful information for that particular teacher, insofar as it confirms the effectiveness of her instructional example; she will likely use it again in that context. However, 'tell a story about your dogs', is not a good general recommendation for all lecturers to enhance students' interest! By asking the right questions and analysing comparable data from student questionnaires across 12 different lectures in different disciplines, I could identify the underlying features of the lectures that stimulated students' interest. From this analysis, it would appear that this lecturers' example is effective because it helps students to see how the content is important to real life. This general principle is, in turn, illustrative of the concept of 'utility value' in expectancy-value theory (Wigfield and Eccles, 2000). Put simply, increasing utility value contributes to an increase in motivation for a given task or activity. In this case, there is heightened interest in paying attention to, and further studying the subject of the lecture. Thus we can go from the particulars of a given lecture to a more general mechanism for how to make lectures more interesting to students (and back again). We achieve this by asking how and why questions, rather than just evaluative (does x work?) questions and applying or developing generalisable theories.

Conclusion

Moving from inquiring about one's own teaching to presenting and writing up that research for wider audiences requires that we frame the problem in terms that are recognisable to others. We do so by acquainting ourselves with the literature and seeing how our specific problem is shared with others. Theories are tools that help us abstract from the specifics of a given case to more general concepts, patterns and explanations. Finally, theories support us as we move into different types of research questions, enabling us to explore more deeply what is happening with students and their interactions with peers, teachers, content and the tasks we set for them. In sum, this essay has illustrated, through a variety of examples, three key principles for how to design, conduct and then publish classroom research beyond one's institution.

References

Ashwin, P. (2012) 'How often are theories developed through empirical research into higher education?' *Studies in Higher Education*, vol. 37, no. 8, pp. 941-955.

- Boyer, E.L. (1990) *Scholarship Reconsidered: Priorities of the Professoriate*. Special Report of the Carnegie Foundation for the Advancement of Teaching. New York, NY: Carnegie Foundation.
- Brookfield, S. (1995) *Becoming a Critically Reflective Teacher*, San Francisco: Jossey-Bass.
- Dolan, E. (2007) 'Grappling with the literature of education research and practice', *CBE-Life Sciences Education*, vol. 5, pp. 289-296.
- Edgerton, R., Hutchings, P. and Quinlan, K. M. (1991) *The Teaching Portfolio: Capturing the Scholarship of Teaching*, Washington, D.C.: American Association for Higher Education.
- Gantogtokh, O. and Quinlan, K.M. (2017) 'Challenges of designing interdisciplinary postgraduate curricula: Case studies of interdisciplinary master's programmes at a research-intensive UK university', *Teaching in Higher Education*, vol. 22, no. 5, pp. 569-586.
- Gurung, R.A., Chick, N.L. and Haynie, A. (2009) *Exploring Signature Pedagogies: Approaches to Teaching Disciplinary Habits of Mind*, Herndon, VA: Stylus Publishing, LLC.
- Hoy, W.K. and Adams, C.M. (2016) *Quantitative Research in Education: A Primer*, Thousand Oaks, CA: Sage.
- Huber, M.T. and Morreale, S.P. (2002) *Disciplinary styles in the scholarship of teaching and learning: Exploring common ground*, Menlo Park: American Association for Higher Education and Carnegie Foundation for the Enhancement of Teaching. Available at: <https://files.eric.ed.gov/fulltext/ED478800.pdf>.
- Hutchings, P. (ed.) (1998) *The Course Portfolio: How Faculty can Examine their Teaching to Advance Practice and Improve Student Learning*, Washington, DC: American Association for Higher Education.
- Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation*, Cambridge: Cambridge University Press.
- Meyer, J.H.F. and Land, R. (2005) 'Threshold concepts and troublesome knowledge: epistemological considerations and a conceptual framework for teaching and learning'. *Higher Education*, vol. 49, no. 3, pp. 373-388.
- Miles, M.B. and Huberman, A.M. (1994) *Qualitative Data Analysis: An Expanded Sourcebook*, Thousand Oaks, CA: Sage.
- Quinlan, K. M., Male, S., Baillie, C., Stamboulis, A., Fill, J., and Jaffer, Z. (2013) 'Methodological challenges in researching threshold concepts: a comparative analysis of three projects', *Higher Education*, vol. 66, pp. 585-601.
- Quinlan, K. M., Male, S., Fill, J., Jaffer, Z., Stamboulis, A. and Baillie, C. (2012) 'Understanding thresholds in first year engineering: digging beneath Mohr's Circle', in P. Kapranos and D. Brabazon's (eds.) *Symposium on Engineering Education, Proceedings 4th International ISEE*, University of Sheffield, July 18-20, pp. 108-115. Available at: https://s3.amazonaws.com/academia.edu.documents/43220678/paper_29.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=153175685

4 &Signature=huc6E0kIQBRRMG3nIC4OosBEwH4%3D&response-content-disposition=inline%3B%20filename%3DUnderstanding_thresholds_in_first_year_e.pdf.

Quinlan, K.M. (2000) 'Striking the Right Balance: An Evaluation of a Literature Database to Support Problem Based Learning'. Paper presented at the Annual Meeting of the American Educational Research Association. Available at <https://files.eric.ed.gov/fulltext/ED453705.pdf>.

Quinlan, K.M. (under review) 'What makes higher education lectures interesting? Personal and situational variables associated with situational interest'. *Studies in Higher Education*.

Rawson, R.E., Quinlan, K.M., Cooper, B.J., Fewtrell, C. and Matlow, J.R. (2005) 'Writing skills development in the health professions', *Teaching and Learning in Medicine*, vol. 17, no. 3, pp. 233-239.

Shulman, L.S. (1993) 'Forum: Teaching as community property', *Change: The Magazine of Higher Learning*, vol. 25, no. 6, pp. 6-7.

Wigfield, A. and Eccles, J.S. (2000) 'Expectancy: value theory of achievement motivation', *Contemporary Educational Psychology*, vol. 25, no. 1, pp. 68-81.

Zimmerman, B.J. (2002) 'Becoming a self-regulated learner: An overview,' *Theory into Practice*, vol. 41, no. 2, pp. 64-70.

Biography

Kathleen M. Quinlan, PhD PFHEA, is Reader in Higher Education and Director of the Centre for the Study of Higher Education at the University of Kent. She holds a PhD in Education from the Stanford School of Education and has researched teaching and learning in higher education for more than 20 years. Kathleen has led educational development programmes at The Australian National University, Cornell University's College of Veterinary Medicine, and the University of Oxford and served as Educator-in- Residence (August 2014) at the National University of Singapore.

Diagramming wrongly: bridging theory and practice with ‘indisciplined’ diagramming

PAUL GRIVELL AND CLAIRE SCANLON
NORTHBROOK METROPOLITAN COLLEGE

Abstract

This paper offers an overview of our recent pedagogic action-research that explores Art and Design students’ use of diagramming, to develop their contextual and critical understanding. In so doing it considers the often difficult relationship between ‘theory’ and ‘practice’ as experienced by students. We argue that student diagramming can provide a productive bridge between theory and practice and between ‘read/write’ and visually orientated modes of learning. We conclude that our students’ frequent misapplication of certain key forms of diagramming often provide a productive ‘first gesture’ into their developing insights. Hence such notional ‘mistakes’ should be actively encouraged rather than corrected.

Key words: Diagramming, Indisciplinarity, Art and Design, Theory and Practice, First gestures.

Some context

At the University of Brighton’s Pedagogic Research Conference in 2018 we gave a presentation entitled ‘Figuring out and thinking through diagrams: Art and Design student and staff uses of diagrammatic forms to explore and explain ideas’. That presentation offered a synopsis of our recent action-research exploring uses of diagramming in higher education Art and Design.

Our action-research was premised on a speculation that diagrammatic practices offer invaluable means for students to question, think through, evaluate and develop their understanding of key concepts and processes, in order to ‘figure out’ their own and others’ ideas and understanding. Thus, our core aim has been to develop students’ use of diagrammatic forms to help them organise, explain and explore their ideas, to both themselves and others, creating diagrams *of* and *for* thought.

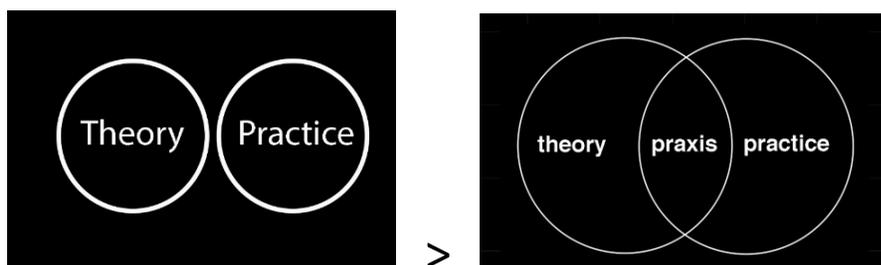
This paper speculates further on some of the concluding observations in that presentation, though in so doing it inevitably needs to recap aspects of the process that led to those observations. The presentation was structured around a Prezi, viewable here: <https://prezi.com/jtth-xbttl-x/figuring-out-and-thinking-through-diagrams-art-and-design-s/?webgl=0>), which includes fuller details of the action-research process, and many examples of student work made in response to the diagramming tasks illustrated in the presentation.

Theory, practice and the space between

At Northbrook Metropolitan College we mostly work with undergraduate Art and Design students on a range of practice-orientated FdA and BA(Hons) programmes. These students dominantly self-identify as visual practitioners, and making images is core to their practices across a range of media forms, including illustration, graphic design, communication design, photography, film and video, painting and drawing. A relatively high percentage of these students are in receipt of the Disabled Students Allowance, most frequently following a diagnosis of dyslexia.

We work with these students across practice and theory, and have a particular interest to develop their capacities to positively integrate and apply theory and practice, though systemic institutional requirements of staffing, timetabling, departmental and course structures can work against this aim.

In so doing we seek to develop 'a thinking of the doing and a doing of the thinking', wherein practice is theorised and theory is practiced. A praxis.



However, there is a well-documented pedagogic issue associated with this aim. Theory is frequently experienced by students in the form of the spoken and written word, in the lecture, the book or journal article, the assessed essay and so on. Some art students express a keen aversion to such text-based 'read/write' learning, and may then come to situate it in contrast or even opposition to their identification as visual makers who 'see/picture'. In extreme cases their personal educational histories have colluded to reinforce a crude binary that declares 'good at art' = 'bad at reading/writing'. In post-compulsory education, such entrenched conceptions may then lead to the perpetuation of well-learned practices of resistance, acquired through many years of compulsory 'read/write' and exam orientated schooling. The well-meaning but reductive application of 'learning styles' to or by students can readily further embed over-determined self-definitions, effectively giving students 'permission' to not engage with certain forms of learning. Evidence for this is seen in a spectrum of resistance, from marginal doodling (picturing as distraction from the boredom of note-making) to the wholesale refusal to read and engage with 'texts' or articulate arguments and ideas in a theorised context per se. Such resistance is often underpinned by the student's profound sense of previous 'academic failure', and hence is in part a learned defensive strategy to avoid further potential humiliation. This self-reinforcing vicious circle of resistance to, and disengagement from, a crucial 'critical/reflective' realm of higher education, inevitably impacts negatively on the student's learning experience as a whole.

Given these concerns, we are always interested to develop productive and meaningful ways to engage students in critical, theoretical ideas that inform and integrate with

their visual practice. In fact, those ideas are indivisible from a critical, creative practice. But nonetheless, the programmes on which we teach do separate 'studio practice' from 'contextual studies' to greater or lesser extents in their modular design. In so doing, the assessment of critical, theoretical, historical and contextual knowledge and understanding requires students to submit work in written forms such as the blog, the essay, the report and the dissertation. However, we contend that there is much merit in this read/write requirement, providing it is in the context of a balanced 'diet' of assessment forms that do not unfairly disadvantage students with read/write weaknesses. Evidently those weaknesses need to be worked on in order to improve them, rather than merely accommodated.

Why diagram?

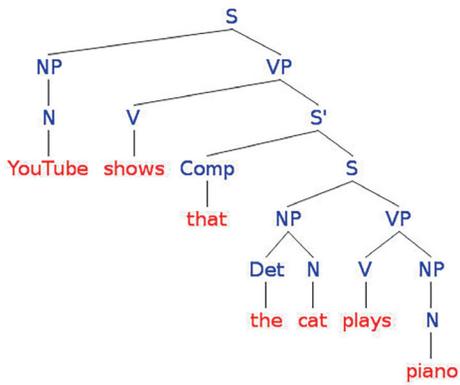
In this context, we often seek to bridge 'read/write' and 'see/picture' learning modes in our pedagogic practices. We encourage students to graphically note-take, to illustrate their writing and to caption and annotate their imaging. Working with students to develop their diagramming practices was an obvious next step in this bridging. And whilst diagrams are frequently used in teaching to visually explain key concepts, here it is the verb rather than the noun form that is emphasised - student diagramming needs to be an active, creative practice.

Educationally key processes and concepts are often developed and communicated in the form of diagrams, and many disciplinary areas draw on specific 'standardised' diagrammatic forms, which students of those disciplines are required to learn and apply.

Consider:

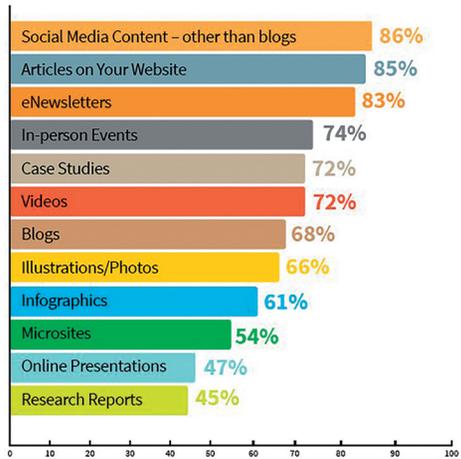


The geographer's map



The linguist's syntax tree

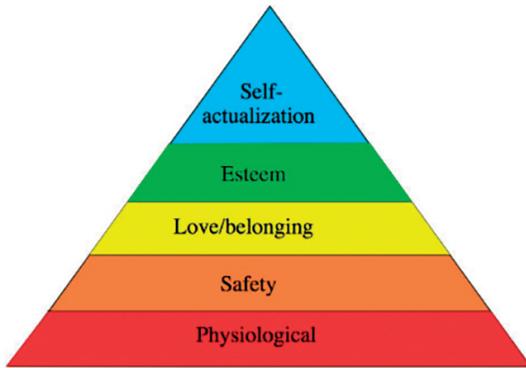
Australian Content Marketing Tactic Usage



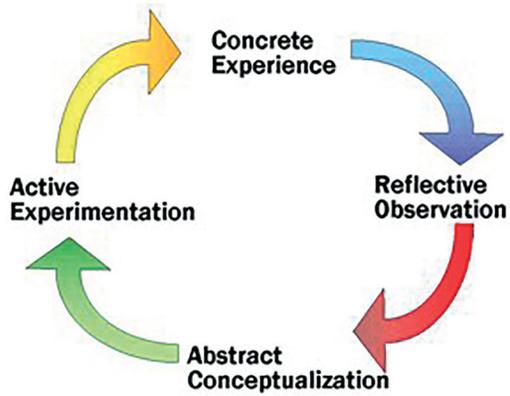
The marketer's bar chart



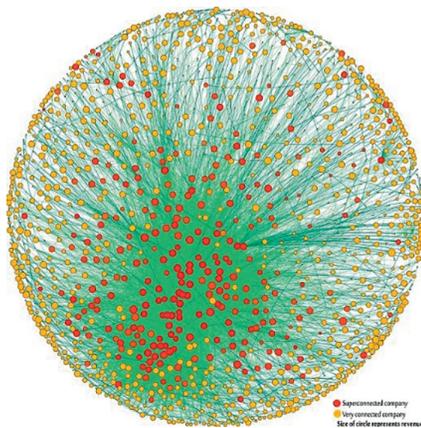
The architect's plan



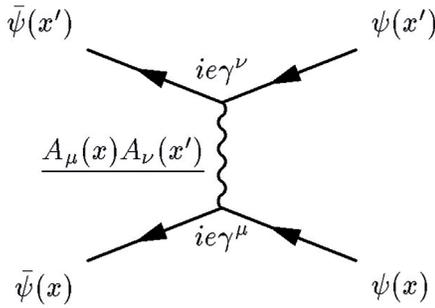
The psychologist's hierarchy



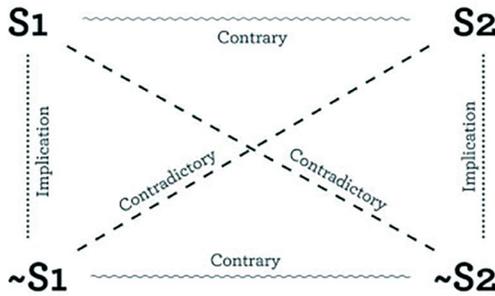
The educationalist's cycle



The economist's global network



The physicist's diagram



The semiotician's square

You may note in this list the absence of a type of artist's diagram (excepting colour charts perhaps), the predominance of representation as an invariant feature of fine art practice privileges the pictorial above the schematic. Therefore, apart from a few significant exceptions, the use of the diagram in art is relegated to individual artist's oeuvres in art history, for example, Paul Klee, Marcel Duchamp etc. In recent times however, the discourse of the diagram in art has opened up in the field of 'artistic research', with artists such as Michael Whittle (2014), Matthew Ritchie (2017) and Nikolaus Gansterer (2017) exemplifying this practice. What is worth noting in these examples, is that these artists' use of diagrammatic forms do not conform to existing disciplinary standards. They take from a multitude of disciplinary fields, and they creatively mix up forms across these disciplines. In this sense, they are 'indisciplined' (Citton, 2012) in their approaches.

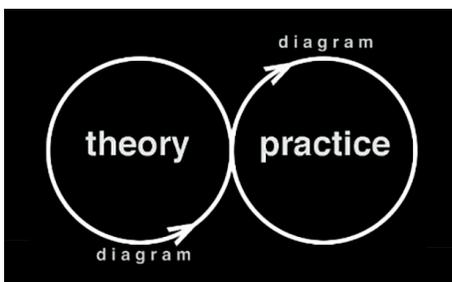
With such 'indisciplined' approaches in mind, diagramming became central to our action-research with students, as it is a to-hand form that bridges image and text, allowing multi-modal processes of thinking to develop in ways that writing alone does not. Through experimental and creative application, it may enable the bringing into understanding of new insight. In its bridging of verb and noun, from process to outcome, diagramming also enables 'reflection in action' (Schön, 1983). And here the bridge metaphor also shifts from noun to verb, indicating a movement between, rather than a structure of connection. In this sense 'process' itself does the work of bridging conception and outcome. And importantly, diagramming functions as both the process by which we might explore and work out ideas, and as the explicatory outcome that communicates those worked out ideas to others, a mode that lets us figure out things for ourselves (and with others), and then enables us to explain those ideas to others (and ourselves).

Digressing slightly, it is worth recalling that Schön was an accomplished jazz and chamber musician adept at improvisation. His keen practical awareness of this skill informed his academic writing, most notably in his exploration of how professionals are able to ‘think on their feet’. He coined the phrase ‘artful doing’ to explain his notion of reflection in action, comparing it to the ways an artist might make a sequence of moves, whilst regularly pausing to reflect on and assess those steps, thereby adding to, correcting and developing their practice in action.

‘In each instance, the practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behavior. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation’. (Schön, 1983, p. 68).

Schön’s description of an artist’s creative process identifies ‘surprise, puzzlement or confusion in a situation which he (sic) finds uncertain or unique’, as key requirements in the move to generate understanding and change. In Art and Design practice these experiences are well understood as foundational to the creative process, and there is an extensive artists’ literature which advocates for them in the studio/creative context (for example, Fisher and Fortnum, 2013; Iversen, 2010). Even in the institutionally constrained realm of art pedagogy, where the metrics of assessment, achievement and award seek to dictate the measurement of ‘learning outcomes’, there is a recognition that students need to be offered opportunities to embrace uncertainty in and through their practice, to take risks, to fail, to make mistakes and to learn by them. Running against the grain of the prevalent ‘managerialist’ quantification of higher education ‘outcomes’, arguably exemplified in the University of Brighton’s recent Curriculum Design Initiative and its imposition of an over-arching regulatory framework. There is a well-established, teacher/practitioner-based approach to art and design pedagogy which resists adherence to prescribed ‘learning outcomes’ in favour of this playful, purposeful exploration of the unknown.

However, these approaches tend to be more at home in the studio than the study. Thus, in the visual see/picture realm of creative art practice, a student’s unknowing/uncertainty may be understood by both themselves and their teacher as an opportunity, an opening onto creativity. But in the realm of the text read/write such student unknowing is often understood and experienced as ignorance, a knowledge deficit in need of remedy. And so, we come full-circle to some students’ resistance to that read/write realm and the significance of diagramming to bridge that gap.

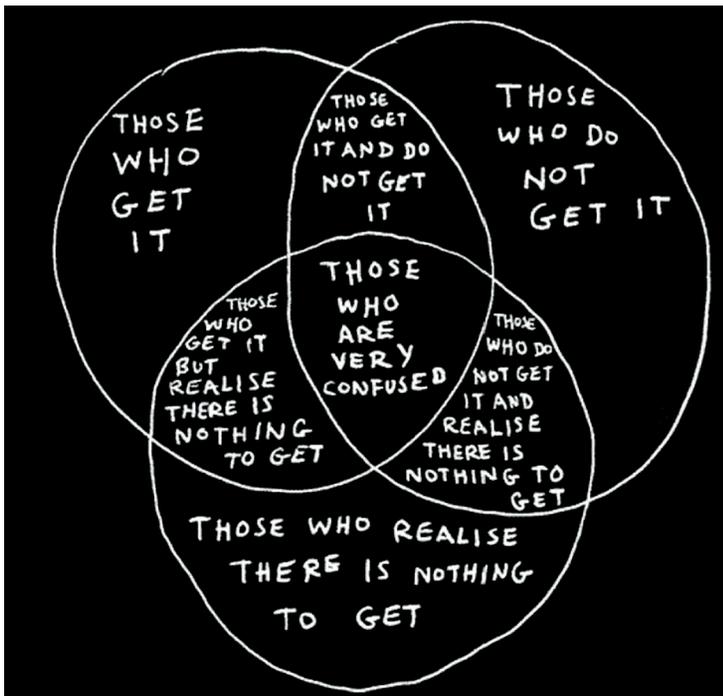


Action research with students in Art and Design: diagramming workshops

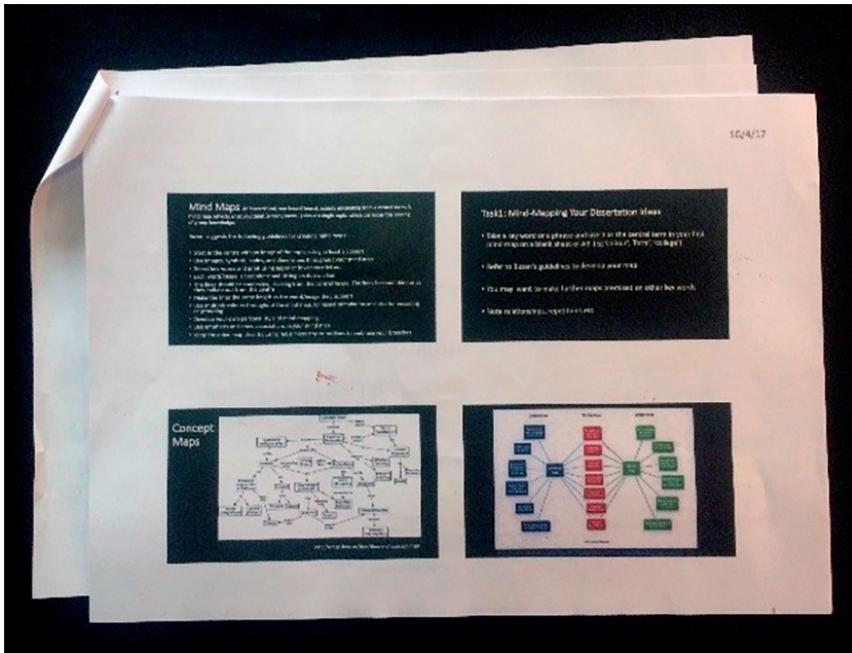
So, bearing in mind Schön's sense of 'artful doing', we were interested to develop an 'indisciplined' and open approach to diagramming with students, premised on the introduction and application of a key set of ubiquitous diagrammatic forms. Importantly the generic forms chosen already operate across disciplines in different and sometimes productively unexpected ways.

The Venn diagram is a good case in point. Its origins are in Set Theory where it has been used to clearly group well defined mathematical objects. But it is now ubiquitously used in many subjects to indicate 'vague' (i.e. non-mathematical, non-logic based) similarities and differences premised on loose 'semantic' groupings. Whilst this vagueness may be anathema to Set theorists, it may still enable genuine insight (and humour) in visually establishing previously un-pictured and un-thought relationships.

In synopsis we designed an adaptable, PowerPoint-led workshop input for use with various groups of students across visual art/design disciplines, introducing them to the use of Mind Maps, Concept Maps, Venn Diagrams and Timelines. These key forms were contextualised and their application explained, and students were then asked to apply those forms in specific contexts. With several of the groups the context was the pursuit of essay writing or dissertation development, where our students often struggle to organise, structure and articulate their ideas. In these workshop sessions, each student was given an A3 'pack' of the PowerPoint slides, with embedded diagramming tasks and blank pages on which to respond (opposite).



'Those who are very confused' by David Shrigley



Page 2 of A3 workshop diagramming pack

Sample Slide 5

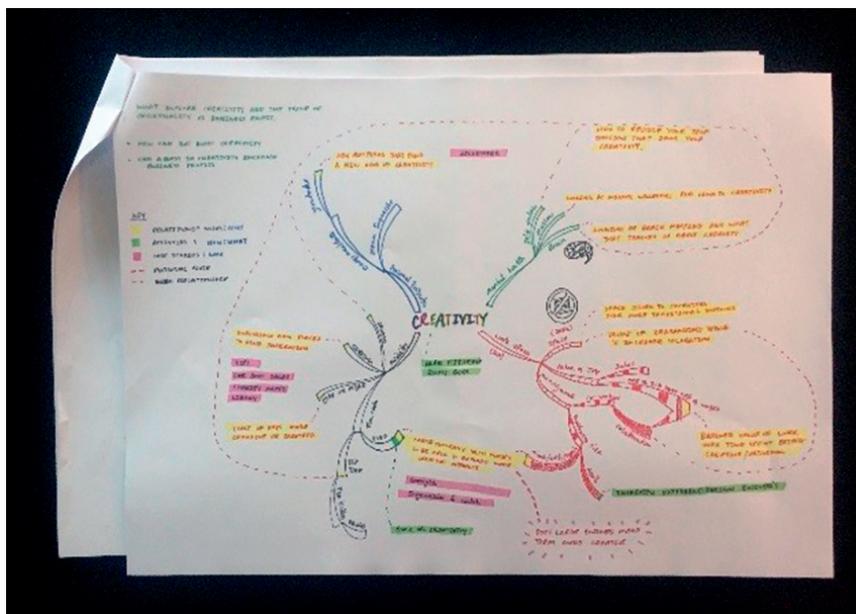
Task1

Mind-Mapping Your Essay Ideas:

- Take a key word or a phrase from your research poster (or essay idea) and use it as the central term in your first mind map on a blank sheet of A3 (eg 'colour', 'form', 'collage')
- Refer to Buzan's guidelines to develop your map
- You may want to make further maps premised on other key words
- Note relationships, repetitions etc

Detail of page 2, mind mapping task slide

At the end of each session this material was gathered in, photocopied and returned to the students for them to take away and develop further. The copied packs then provided a 'data' archive for us to reflect upon. In some instances, students were asked to write short evaluations, commenting on their experience and the value of diagramming ideas in these ways. In other instances, follow up tasks required students to post their diagramming responses on blogs, along with additional reflection and commentary.



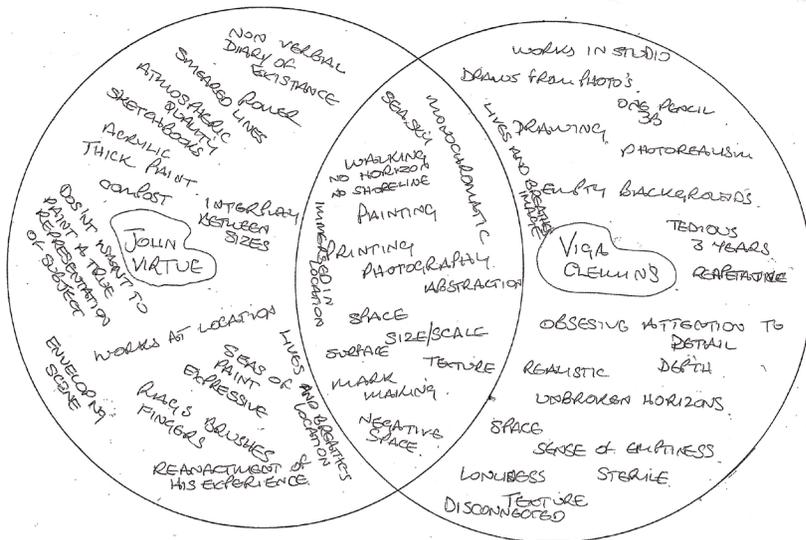
(Initially blank) page 3 of diagramming pack, with student's diagrammatic response to mind mapping task

Overview of student responses to, and feedback on, workshop tasks

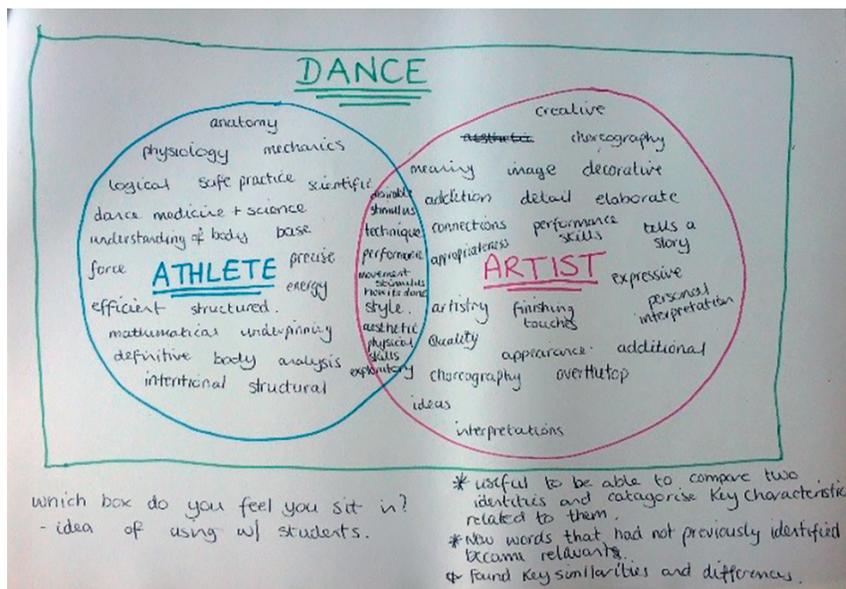
Overall, students were predominantly positive and enthusiastic about the merit of using these diagrammatic practices to think through their initial ideas, especially the mind mapping. Many commented on how the process enabled them to gather their thoughts, sift through and make connections between ideas whilst consolidating their knowledge of a given field of enquiry. Developmentally mind-mapping their ideas and knowledge, with an increasing focus on key words, was often commented upon as particularly productive and useful. Subsequently looking over examples of these mind maps also gave us, as future supervisors of the projects being initiated in this context, a very useful insight into students' levels of understanding and knowledge of their specialist field. When produced alone, mind maps tend to enable the 'getting down on paper' of the already known (or assumed), and whilst they also enable the making of connections and relationships between 'facts', they importantly serve as useful markers of existing knowledge. Students were subsequently asked to bring these maps to early stage supervision tutorials, which enabled us to helpfully comment on 'knowledge gaps' and to point students to relevant sources to plug those gaps.

The PGCE student's commentary on his mind map (bottom right of image opposite), astutely notes that the form is helpful in 'identifying what I know, and more importantly, what I don't know'.

Whilst mind maps were nearly always positively endorsed in student feedback, Venn diagrams received a much more mixed response. In part, this may well have been a consequence of us asking students to take comparative elements from their mind maps in order to develop Venns, and in so doing relegating Venns to a sub-set of those mind-maps. However, where students were already clearly working with comparative elements

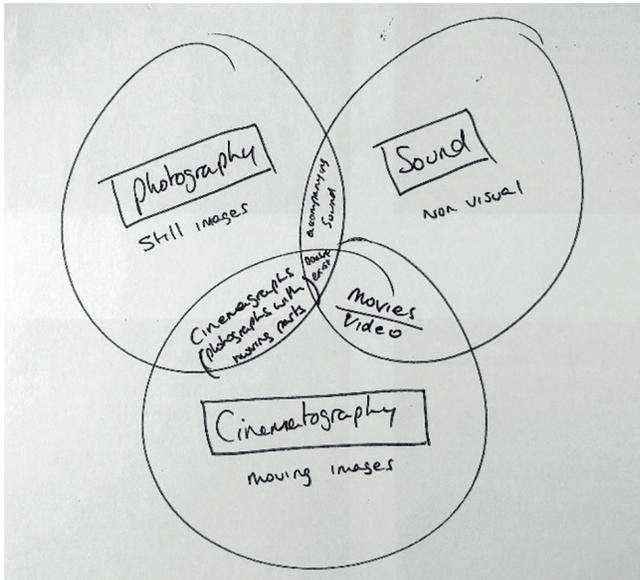


BA Fine Art student's Venn diagram ideas for comparative essay



PGCE student's Venn diagram exploring elements of her proposed action-research project

Likewise, in the above example, a PGCE student specialising in dance comments on her Venn (bottom right of image) that it has helped her categorise characteristics and identify key similarities and differences. Interestingly she has also noted that she could use this diagrammatic form as a research tool with her own student research subjects, asking them where they might position themselves in the binary structure.



Design student's 'dissertation ideas' Venn diagram, exploring overlaps of sound, still and moving images

As with mind maps, some Venn diagrams also helped students (and future supervisors) to identify knowledge gaps.

In the above example the student's assumption that the central zone of overlap between photography, cinema and sound 'doesn't exist' might be productively challenged, Chris Marker's 'La Jetée' immediately comes to mind, along with Ken Burns.

And, so what?

However, whilst students generally expressed enthusiasm about these diagramming tasks, and frequently commented on the positive value of these forms in relation to the development of their research projects, this should perhaps come as no surprise. Diagramming as a means to gather, organise and structure content ahead of essay and dissertation writing is a well-established, if all too often neglected, practice.

There exists a multitude of educational resources promoting the use of diagramming to school, further education and higher education students, some of which advocate similar approaches to those we have drawn upon. In fact, our PowerPoint-led student workshop sessions made explicit reference to the self-annointed Mind Map™ guru Tony Buzan, who has written dozens and sold millions of books on the subject. So, nothing new?

Well perhaps. Firstly, it is worth pointing out that very many of the readily available digital resources for diagramming offer highly prescriptive, rigid formats that narrowly structure the ways in which students can use graphical/diagrammatic forms. To generalise, they tend to provide pre-determined frameworks into which students are required to enter (descriptive) content in the form of words. See for instance Education Place (<https://www.eduplace.com/graphicorganizer/>) or Inspiration@Inc, 'The Leader in Visual Thinking and Learning' (<http://www.inspiration.com/visual-learning>). These models are premised on a very reductive understanding of education as 'information retention',

undoubtedly highly appropriate to the requirements of many areas of the National Curriculum and their examination at GCSE and A-level. Often these materials are explicitly designed to enable student 'mastery' of subject matter, with graphic organisers epitomising this approach:

'By using graphic organisers across all subject areas, you will be empowering your students to master subject-matter faster and more efficiently'. TeacherVision® website. Available at: <https://www.teachervision.com/lesson-planning/graphic-organizer>.

Interestingly both Buzan's many books, most of which pre-date digital forms of diagramming, and his website advocate an analogue approach to mind mapping, citing its material simplicity and to-hand-ness as positive features. Nonetheless, his trade-marked format is relatively prescribed, and is monetarised in a digital iMindMap app which rigidly adheres to the Buzan prescription, preventing users from doing anything other than making a formulaic Buzan-style mind map. We contend that this rigid and digitally constrained use of 'given' diagrammatic forms works against our aim to enable creative indisciplinary in students' diagramming.

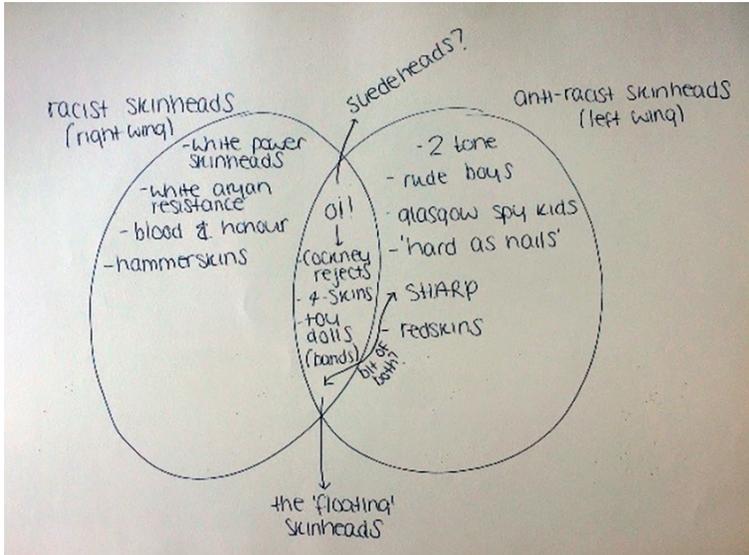
So, with an awareness of these prescribed forms, we were very keen to provide students with little more than a blank sheet of A3 paper, coloured pens, and a general overview of how they might proceed to diagram their ideas using different formats. Indeed, it is notable that some enthused students, who were subsequently asked to post their diagramming efforts on their research blogs, went on to explore the use of digital mind mapping software, and in every instance these digital diagrams dramatically changed in quality as they became bound by the structures and strictures of that software. Somehow, the personality of the creator vanished in this process, along with the idiosyncrasies of their understanding of diagrammatic forms.

Which brings us to our second point. One striking aspect of our action research project was the extent to which we over-estimated students' existing understanding of what we took to be ubiquitous diagrammatic forms. Whilst most students told us that they had previously used versions of mind mapping, and were aware of Venn diagrams, in practice many were unaware of the conventions of application, and found it quite demanding to 'accurately' apply our accounts of these forms to their diagramming tasks in the development of their ideas. They also often commented that they wished they'd been introduced to these forms and their uses earlier on in their courses.

On recognising this 'weakness' early on in our workshop sessions, we then spent more time with students in subsequent sessions outlining how these diagrammatic forms worked. However, in retrospect we now sense that this may not have been time particularly well spent ...

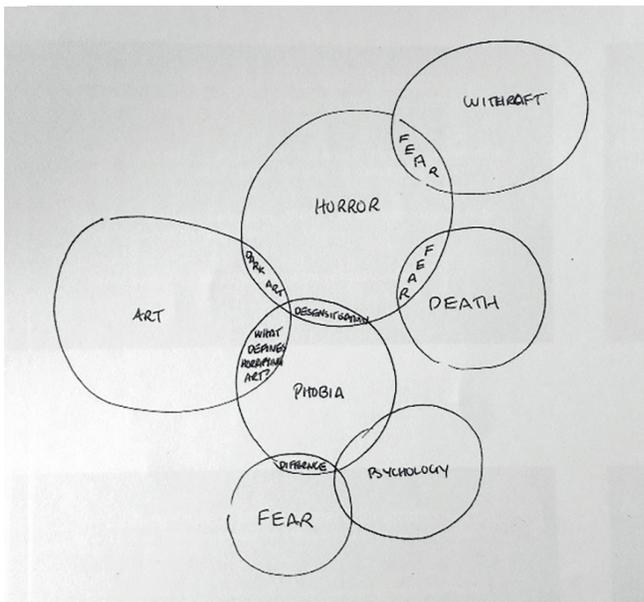
Diagramming wrongly

In reviewing the 'data' generated by students in our workshop sessions we have looked over hundreds of their diagrams, read their feedback and talked with many about their experiences. In very many instances those diagrams are not entirely 'correct'. They include misunderstandings about the form, over-stated assumptions, inaccurate/irrelevant 'content' and misapplication of structuring elements. In some instances, students have appended their diagrams with questions or critical commentary.



Student's Venn diagram exploring essay ideas, with arrows and question marks indicating uncertainties

In a number of instances, they have creatively, and perhaps unwittingly, fused forms to create hybrid diagrams that contain elements of mind maps, concept maps and Venn diagrams all in one.



Student's hybrid mind map/Venn exploring essay ideas

Nonetheless, this 'indisciplined' approach to diagramming often resulted in the students gaining real insights and 'moving forward' in their thinking, especially where they returned to rework initial diagrams.

O'Sullivan (2016), writing on the diagramming practices of artist Karin Schneider notes that:

'The diagram here is a strategy of experimentation that scrambles narrative, figuration - the givens - and allows something else, at last, to step forward. This is the production of the unknown from within the known, the unseen from within the seen. The diagram, we might say, is a strategy for sidestepping intention from within intention; it involves the production of something that then 'speaks back' to its progenitor'. (p. 17).

In this sense our students' diagrammatic mistakes, misconceptions and hybridisation of forms become an opening onto their unknowns, and at the same time a vehicle from which to reflect on them. O'Sullivan goes on to speculate that;

'A diagram, especially as drawing, often leads ahead of conceptual thought. It operates as a probe prior to any consistency (this, we might say, is the diagram as sketch). The diagram can also move at a different speed from, for example, writing, and as such can achieve an escape velocity from the purely textual (this, we might say, is the diagram as automatic writing). The speed of the hand (or intelligence of the body) can outrun the cogito (or, more simply, the diagram is of the unconscious, however the latter is figured) ... Such a practice - manipulating concepts as if on a tabletop - might, again, allow for hitherto 'illegal' connections and syntheses to be made'. (p. 21).

Importantly O'Sullivan also argues that these 'illegal' connections and syntheses' are always open to revision. They are starting points to be returned to, developed further and mutated anew both during and after the event of their initial making.

Interestingly we also identify with this approach in our own attempts at 'explicatory' diagramming, as teachers in front of students. There have been plenty of occasions when we have sought to visualise and 'explain' a concept under discussion with students by using 'ad hoc', 'improvised' white board diagrams. All too often they don't at first 'work', though they serve as placeholders or 'first gestures', to be developed, rethought, partially erased and re-drawn, often in conjunction with those students, until a mutual coherence and understanding emerges. Such revisions, with or by students, may enable a rethinking of assumed categories and content, and a re-working of diagrammatic forms in order to arrive at genuine new insight. Hence, we should not be dismissive of diagrams that appear to 'not work'. They are often the necessary 'first gesture' which will help us move on. Their 'wrong-ness' merely warrants reflection and possible re-configuration.

Moving on

In conclusion, and looking forward to future diagramming with students, we now suggest that we need not spend more time ensuring that the conventions of given diagrammatic forms are fully understood before encouraging students to creatively apply those approaches. Rather, that time might be better spent in reflective discussion and further development of those 'wrongly diagrammed' first gestures.

This aim aligns closely with Dean Kenning (2014) and his advocacy of Social Body Mind Maps (SBMM), described as diagrammatic leaning tools which:

'... enable critical reflection on previous or current creative practice, with a view to future work. Students draw a 'map', which begins with an image of an artwork or part of an artwork (sculpture, drawing, film, etc.) that they have made, are making, or are thinking about making'. (p. 3).

Like us, Kenning conceives of these student generated maps as key means for them to materialise an understanding of the context of their art practice. But rather than starting with a theoretical/contextual issue in the form of essay title or research project idea, Kenning asks students to begin their diagramming with their own artwork, and to work out from that to develop an understanding of its context. In this sense Kenning's starting point is the studio, where many students feel 'at home', whilst we are beginning in the study, where we may have to lead them. And for Kenning as for us, there are no 'wrong' diagrams:

'As the SBMM is a heuristic tool to generate reflection through production, and vice versa, there can be no 'wrong' or 'bad' maps, only maps that are more or less engaged, more or less developed. Talking through ideas with a student as they are drawing their maps, encouraging interesting pathways, and referring their specific linkages to concrete determining forces, enables more confidence in 'letting go', letting the diagrammatic machine they are constructing 'think' for them'. (p. 6).

Like us, he is also critical of current assessment culture, which he argues directly mitigates against Schön's notion of 'reflection in action'/'artful doing', as it compels teachers to measure student 'performance' against predetermined 'learning objectives'. In this reductive model, creative enquiry and exploration swiftly stagnate into a prescribed sequence of learnable and readily achievable steps to success. Presentation comes to be rewarded over exploration, and reflection is always post hoc, merely a matter of demonstrable confirmation to show how those learning outcomes have been achieved.

By contrast, both Kenning's SBMMs and our students' wrongly drawn diagrams, fail to provide assessable confirmative evidence of assimilated knowledge or universally applicable solutions, though it may be argued that they do offer students a degree of agency in creatively visualising their understanding of issues, ideas and practices bearing upon them as they negotiate and move through the unknown.

Bibliography

Citton, Y. (2012) 'From Theory to bricolage: indiscipline and the exemplary gestures of interpretation' *International Social Science Journal*, Wiley, 2012, *States of Theory: Contemporary Schools of Thought and Institutions of Knowledge*, 63 (207-208), pp. 53-66.

Fisher, E. and Fortnum, R. (eds.) (2013) *On Not Knowing: How Artists Think*, London: Black Dog Publishing.

Gansterer, N. (2017) *Drawing A Hypothesis: Figures of Thought*, Berlin/Boston: De Gruyter

Iversen, M. (ed.) (2010) *Chance: Documents of Contemporary Art*, London: Whitechapel/MIT Press.

Kenning, D. (2014) *Thinking Through Art: The Social Body Mind Map*. Available at:

https://www.academia.edu/11324519/Thinking_Through_Art_The_Social_Body_Mind_Map.

O'Sullivan, S. (2016) 'On the Diagram (and a Practice of Diagrammatics)' in Schneider, K. and Yasar, B. (eds.) *Situational Diagram*, New York: Dominique Lévy, pp. 13-25.

Available at: <https://www.simonosullivan.net/articles.html>.

Ritchie, M. (2017) *The Temptation of the Diagram*. vols.1 and 2. Artist publication. P.O.D. Milton Keynes: Lightning Source UK Ltd.

Ritchie, M. (2017) *Surrender to the Diagram*. Houston: University of Houston.

Schön, D. (1983) *The Reflective Practitioner: How Professionals Think in Action*.

Aldershot: Ashgate Publishing Ltd.

Whittle, M. (2014) 'Romantic-Objectivism: diagrammatic thought in contemporary art'.

PhD Kyoto City University. Available at: <http://www.michael-whittle.com/research.html>

Acknowledgements

With thanks to David Shrigley, for permission to reproduce his Venn diagram 'Those Who Are Very Confused'. We recommend to you a musical performance/translation of this diagram available here: <https://vimeo.com/116883362>.

Biographies

Paul Grivell and **Claire Scanlon** both work in the Creative Industries department of Northbrook Metropolitan College, part of Greater Brighton Metropolitan College. They teach across a range of higher education Art and Design courses, with specialisms in the practices of drawing, painting and photography, art history and theory. They also collaborate as researchers and artists, exhibiting as ScanlonandGrivell.

Can fidgeting be used to measure student engagement in online learning tasks?

DR HARRY J. WITCHEL, BRIGHTON AND SUSSEX MEDICAL SCHOOL (BSMS); DR CARINA E. I. WESTLING, UNIVERSITY OF SUSSEX; JULIAN TEE, THOMAS T. RANJI, BSMS; ROB NEEDHAM, DR AOIFE HEALEY, STAFFORDSHIRE UNIVERSITY (SU); CARLOS P. SANTOS, DR K. JAMES ACKAH, JOE CHALKLEY, BSMS AND PROFESSOR NACHIAPPAN CHOCKALINGAM, SU

Abstract

Fidgeting may be a way to monitor second-by-second student engagement, which would be especially useful for gauging and improving the effectiveness of online learning. This article is based on research that found less fidgeting during a formative online reading comprehension test indicated that students were more engaged.

Online formative assessments are effective facilitators of engagement, especially with intelligent tutoring systems. This research used two computerised, three-minute reading-comprehension tests, identical in all aspects except that one reading was boring and the other was interesting. These were presented to 27 healthy adult volunteers while alone in a classroom; the stimuli were combined with an interrupting clicking task that forces screen engagement. The participants' postural movements were measured using video-tracking, and these were compared to subjective ratings for ten visual analogue scales in a repeated measures design.

The interesting reading elicited less fidgeting shoulder movement than the boring reading. There was also a correlation between the ratings for wanting 'the experience to end earlier' and the extent of shoulder movement. The research also indicated that the context of formative online reading tests, the type of boredom elicited is restless rather than lethargic.

Keywords: Engagement, boredom, Non-instrumental Movement Inhibition (NIMI), fidgeting.

Introduction

This article reviews the strengths and weaknesses of using measurements of fidgeting as a metric for engagement during online learning tasks. Online learning tasks are associated with a range of special cognitive states called learning emotions. Engagement is one of the key cognitive states for learning during education. The rationale for measuring engagement objectively is to complement and verify traditional subjective measurements; physical measures also give useful moment-to-moment measurements without interruption of a task. Fidgeting is one of a class of non-instrumental move-

ments that are inhibited when a person engages with a task. A variety of seated tasks in human-computer interaction have been shown to result in Non-Instrumental Movement Inhibition (NIMI). A number of experiments from our lab have clearly demonstrated that subjective engagement is linked with a measurable reduction in fidgeting.

Achievement emotions relating to learning and education

There are many different models of emotions and cognitive states. The most well-known are Russell's circumplex model with axes of valence and arousal (Russell, 1980), and Ekman's model of seven discrete basic emotions (happiness, sadness, fear, anger, disgust, surprise and contempt) (Ekman, 1999). Pekrun and colleagues have recognised that many of the basic emotions that Ekman highlighted are states that seem rarely relevant in the classroom, so they developed a model of achievement emotions that include: engagement, boredom, anger, hope, pride, enjoyment, hopelessness, anxiety and shame (Pekrun et al., 2006). In this structure, engagement is one of the key cognitive states for successful learning.

Engagement

Engagement is a cognitive state relevant to the applied psychologies including work psychology (Kahn, 1990; Macey and Schneider, 2008; Christian et al., 2011), educational psychology (Finn and Zimmer, 2012), positive psychology (Csikszentmihalyi, 1998), and human computer interaction (HCI) (Webster and Ho, 1997; O'Brien and Toms, 2010). Engagement is also important in human factors and ergonomics (for example, vigilance), experience design (both online and in the theatre), and in the emerging field of human-robot interaction. Each field has a different way to define and measure engagement, although all agree that engagement involves interaction and is in some way different from attention. Most definitions presume that usually engagement lasts longer than attention, engagement allows for some concurrent activity, and that engagement will have some influence on later behaviours.

Our group defines engagement as a family of related cognitive states geared toward extended interaction and/or a purposeful outcome, operationalised by a collection of behaviours, none of which are absolutely necessary at a given point in time, including: attendance, attention, memory, caring, emotion, taking action, making an effort, and (similar to the exclusion in attention) inhibition of irrelevant activities (Witchel, 2013a). The inhibition of irrelevant activities is explained as follows: when students engage with a lecture (a purposeful activity), they will inhibit irrelevant activities such as playing video games and talking to their friends, while pursuing appropriate activities such as watching the lecture and taking notes. The advantages of this definition of engagement are:

- 1) It includes negative feelings that result in continued interaction (for example, when a student intelligently but persistently disagrees with an instructor).
- 2) It focuses on measurable effects/outputs of engagement rather than mixing causes and effects, and thus avoids presupposing the causes of engagement.
- 3) It allows for a purposeful outcome without further extension (for example, the joy of a performing a chore well, without the desire to extend the chore).

The reason engagement is considered important is that it is understood to be a fundamental factor to many successful tasks performed by a person in a relationship with an organisation. It is assumed that a student who is supposed to learn in a school will have to engage with the school in order for the learning to take place. Likewise, it is presumed that an employee who is expected to perform a task will need to engage with their employment and employer in order for that task to be done correctly, and in a way that the task fits in with the larger product or service being delivered. In human-computer interaction, engagement is the primary factor being sought, whether the goal is to teach the end user or to advertise to them.

Measuring engagement

There have been many different ways demonstrated to measure the different types of engagement, usually being dependent upon the context of engagement; thus, there are checklists for student engagement (Finn and Zimmer, 2012), employee engagement (Kahn, 1990), and engagement with the internet (O'Brien and Toms, 2010). When judging the engagement of online interaction, many researchers have focused on blunt engagement metrics such as footfall, hits, or time on page (Witchel and Westling, 2013b); such metrics do not exclude situations when end users are not really engaged, such as when they load a page and then go away to get a coffee.

The opportunity to make objective (usually physical) measurements on end users addresses this issue. These objective measurements can include physiological measures (electrodermal responses or heart rate), deliberate behaviours (mouse activity), or non-instrumental behaviours (facial expressions, fidgeting). The main disadvantage to using these physical measures is that the measurement process and the analysis is usually performed on a single user at a time, and is often laborious. The demands of these measurements mean that they are often used as a complement to less laborious subjective measurements. Furthermore, the interpretation of the physical/objective measures is difficult and requires a conceptual model for explanation. Nevertheless, objective metrics have the advantage of being less subject to dissimulation or alteration for social purposes.

Posture and fidgeting

Posture is popularly associated with engagement, especially within human-computer interaction. It is sometimes suggested that there is a simple equivalence between approach and engagement; that is, people who are engaged with a computer (or a person) will lean forward, and when people disengage, they will lean back slightly (Sanghvi et al., 2011; Coan and Gottman, 2007). This idea is widely accepted among the general public (Pease and Pease, 2004). However, our team and others have sought and failed to find this association in situations where the end user is already sitting in a chair in front of a screen in a laboratory experiment (Witchel et al., 2016; Mota and Picard, 2003). One explanation for this lack of association is that forward-leaning, load-bearing postures, where the head rests on the hand(s), are usually associated with boredom, disengagement, or difficulty, despite the fact that these postures are usually linked to increased leaning forward compared to most other seated postures.

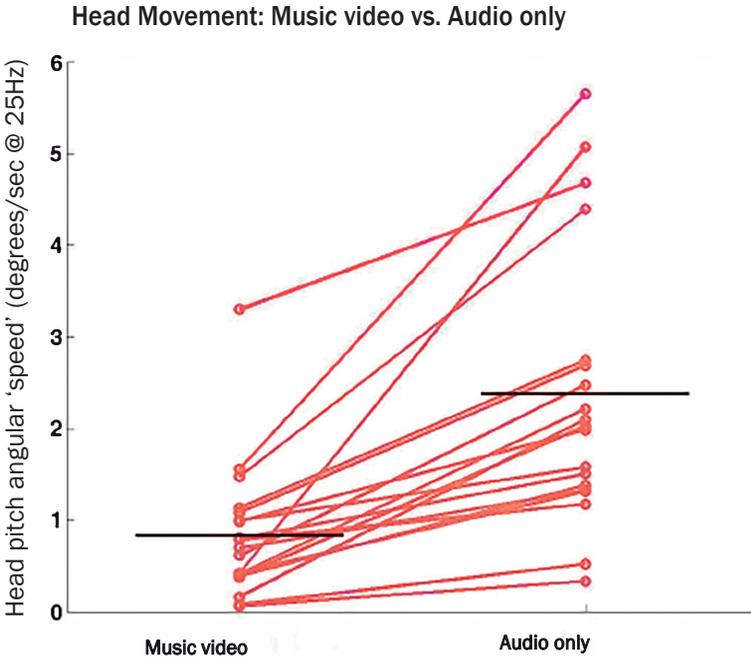


Figure 1. Head movement elicited by a music video vs. by the same audio track alone. Data adapted from Witchel et al., 2016.

By contrast, scientific study and statistical analysis has shown that boredom or disengagement is typically associated with increased movement, and thus engagement is associated with decreased movements (D’Mello et al., 2007; Grafsgaard et al., 2012; Witchel et al., 2016). We have shown that part of the reason for this is due to the requirements of a steady gaze (see Figure 1), but that further inhibition of non-instrumental movements occurs simply due to engagement, irrespective of gaze (see Table 1) (Witchel et al., 2016).

DISENGAGEMENT	WATCHFULNESS/VIGILANCE
Non-visual stimulus	Visual stimulus
Internal mentation	High content rate
Break-taking	Persistent new content
Boredom	Interest

Table 1. Causes of monitor disengagement and engagement

Movements can be functionally categorised as those that are part of the current deliberate task (instrumental movements) and those that are not (non-instrumental movements). Fidgeting is one of a class of non-instrumental movements (see Table 2, over), which are inhibited when a person engages with a task (Witchel et al., 2014). Fidgeting is also thought to be an explicit result of task unrelated thoughts, or mind wandering (Seli et al., 2014; Carriere et al., 2013). This is presumably due to the fact that thought is embodied, and that unstructured thought is reflected by unstructured movement that permits it (D’Mello et al., 2012).

INSTRUMENTAL	NON-INSTRUMENTAL
Explicit task movements	Comfort movements
Implicit task movements	<ul style="list-style-type: none"> ▪ Break-taking ▪ Scratching
<ul style="list-style-type: none"> ▪ Gaze (eye, head, shoulders) to see another part of the screen ▪ Rotate ▪ Lean in to see something small ▪ Controller (arm, shoulder) 	Emotional expressions <ul style="list-style-type: none"> ▪ Face touching ▪ Self-adaptors
	Escape movements <ul style="list-style-type: none"> ▪ Fidgeting

Table 2. Categorising movements that are typically observed during human-computer interaction. Examples of instrumental vs. non-instrumental movements.

Measuring movement as a surrogate for engagement or boredom

Movement can be measured in a variety of ways. In traditional psychology experiments movement was manually scored by trained observers (Bull, 1987). Precise measurements of specific movements can now be made by opto-electronic systems such as Vicon or the Microsoft Kinect depth sensor (Witchel et al., 2012; Grafsgaard et al., 2012). It was previously assumed that specific movements had specific meanings, although these meanings (other than for facial expressions) were difficult to specify. More broad measurements of total movement have been estimated by seat pad sensors (D’Mello et al., 2007; Seli et al., 2014), video tracking (Witchel et al., 2014) and wearable inertial sensors (Chalkley et al., 2017).

One difficulty in interpreting movement as disengagement is that certain types of instrumental movements are required by, or related to, the task (see Table 2). For example, in sports or dancing, greater engagement is linked to increased movement. By contrast, watching engaging videos on a screen will be linked with a type of rapt engagement that suppresses most movement (see Figure 2). The resulting measure-

	INTERESTED	BORED
Physically active	Dynamic engagement (Instrumental or entrained)	Restless
Physically still	Rapt engagement (e.g. NIMI)	Lethargic

Figure 2. Relating engagement and boredom to measurements of total movement. There are effectively two kinds of engagement (one with extensive bodily movement and the other without) and two kinds of boredom. In most human-computer interaction, the more common states are rapt engagement and restlessness.

ment ambiguity would be solved if there were an automated way to differentiate instrumental from non-instrumental movements by the quality of the movement (see Figure 3). Unfortunately, it is not currently possible to use the nature of the movement to recognise whether the movement is instrumental. To solve this issue, our group has designed interactive tasks and stimuli where almost all activity is by definition non-instrumental. For example, when listening to music while seated in a chair, literally all movement is

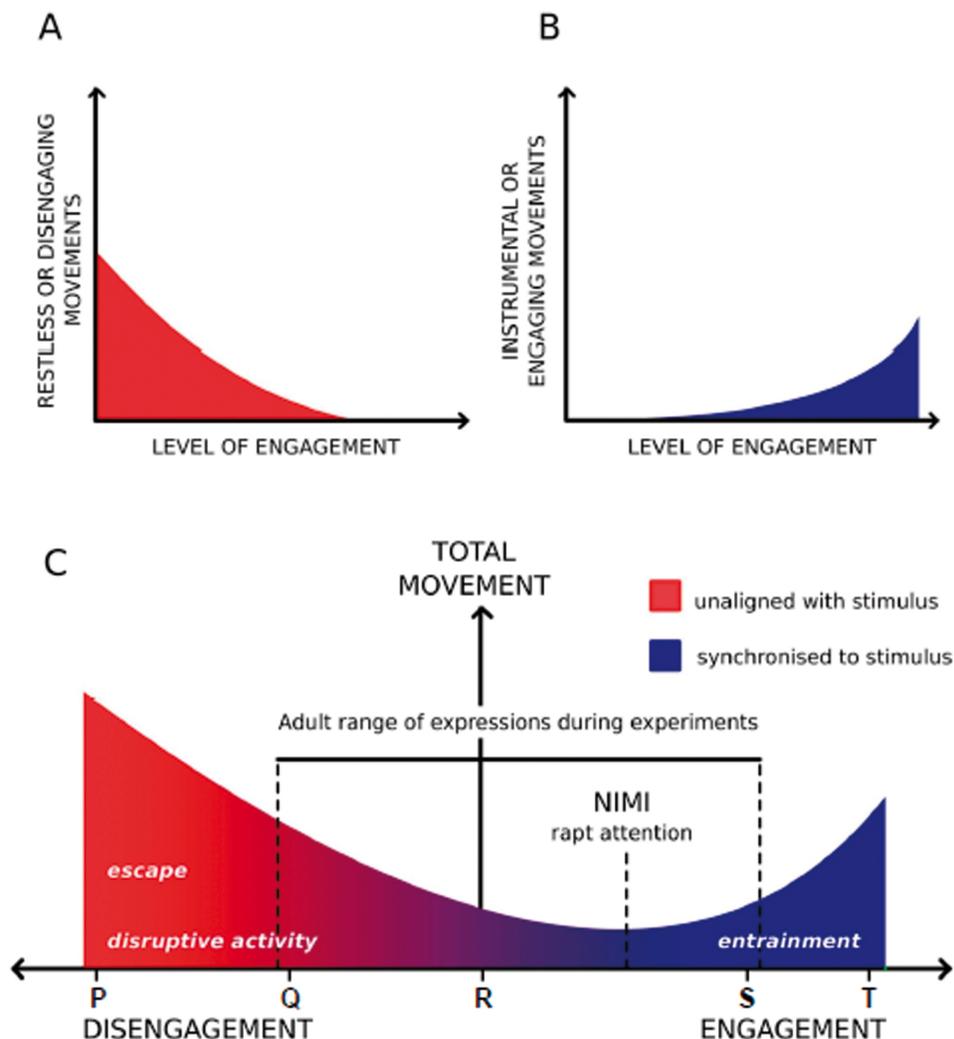


Figure 3. Total movement (curve, panel C) is the additive sum of two kinds of movement: non-instrumental movement (red, panel A) plus instrumental movement (blue panel B). Non-instrumental movement is not synchronised to the stimulus (i.e. its timing is self-generated and related to mind wandering). In panel C, the x-axis shows the comparative engagement of levels of different activities: P – running away from the stimulus, Q – fidgeting when bored by the stimulus, R – interested by an on-screen stimulus, S – engaged with an active on-screen stimulus such as a driving game with a steering wheel, and T – engaged with a physical (non-seated) task, such as dancing. Used with permission, Witchel et al., 2014a.

non-instrumental (Witchel et al., 2013c). Similarly, when a participant is watching a video, nearly all movement is non-instrumental except for head and eye movement associated with gaze (Witchel et al., 2014b). One methodological advance that our group has deployed is to make interactive stimuli that are controlled completely by a handheld trackball (as opposed to a mouse and keyboard); in these situations, the only instrumental movements (in addition to those linked with gaze) are thumb movements.

To precisely test whether engagement itself was affecting fidgeting, two nearly identical reading tasks were presented to 27 participants (in a counterbalanced order) (Witchel et al., 2016). The only difference between the tasks was that one reading was interesting (an excerpt from a best-selling novel) while the other excerpt was boring (regulations on banking by the European Union); note that these experiments were run over two years before the UK Brexit vote, when the EU was simply considered boring. Both tasks required participants to click a handheld trackball approximately every two seconds when a grey signal appeared on the screen (and temporarily interrupted the reading), in order to verify (with reaction times) that participants were maintaining their attention on the stimulus. Head movements (based on video analysis of the lateral aspect film) were calculated for each 180 second task (see Figure 4). The boring stimulus

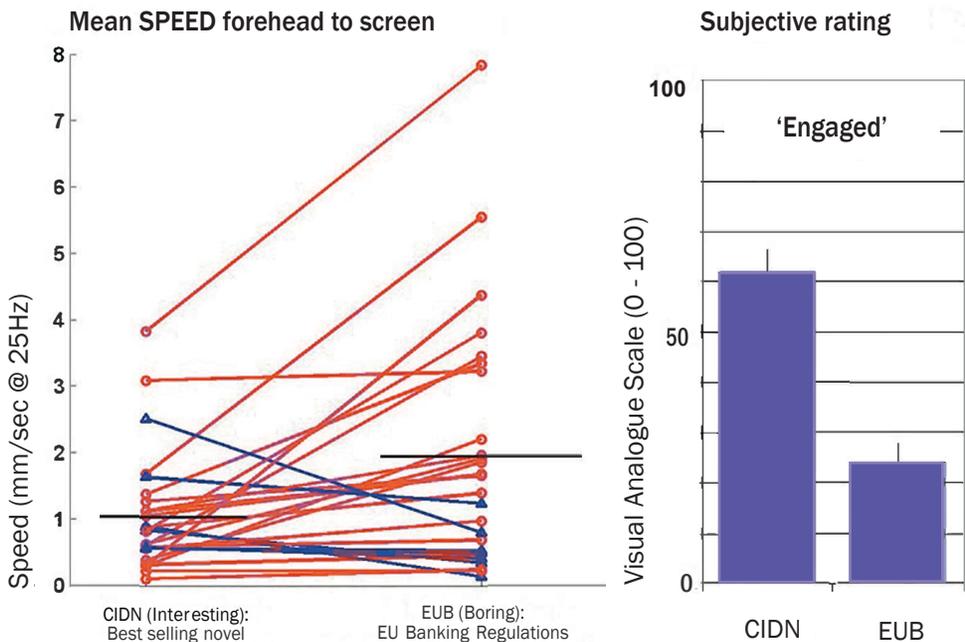


Figure 4. Engagement leads to decreased movement in comparable reading tasks. The panel at left shows the net head speed for two comparable on-screen reading tasks, where one task included interesting text (a best selling novel) while the other did not (EU banking regulations). Each pair of points with a line is a single participant who experienced both stimuli. The black horizontal lines are mean values. The panel at right shows the subjective ratings (mean \pm s.e.m.¹) of the two stimuli based on a visual analogue scale for 'I felt totally engaged'. ($P < 0.05$, ANOVA² with post hoc Tukey test). Adapted from (Witchel et al., 2016).

1 s.e.m: standard error of mean.

2 ANOVA: Analysis of variance, a statistical technique.

elicited approximately double the amount of movement as the interesting one. In the same experiments, thigh movement was also equally doubled by the boring stimulus, so the result is not simply a result of gaze stabilisation. This result is essentially identical to what was found 130 years earlier by Francis Galton, who observed listener's head movements while listening to a lecture, and found the same ratio in a comparison of when people were interested vs. bored (Galton, 1885).

Conclusion

Our team has found that 1) Proximity (mean distance to screen) is a poor metric for engagement, because bored people have a wide 'range' of positions. 2) Engagement is associated with NIMI. Thus, the most revealing postural measurement for understanding engagement is net movement, rather than position or distance from the screen. 3) Total thigh movement is more specific to boredom than total head movement because the head often moves instrumentally to maintain gaze. 4) Wrists and ankles also respond to engagement with NIMI, and they show a weaker difference than thigh measurements. Future efforts will focus on attempting to differentiate non-instrumental from instrumental movements based on the structure or timing of the movements.

Acknowledgements

We gratefully acknowledge the technical contributions of Michael Roberts, Jacob Greaves, Amy Moffat, and the administrative contributions of Châtrin Tolga and Terri Desmonds. We acknowledge funding received from The Wellcome Trust and Brighton and Sussex Medical School's Independent Research Programme. Finally, for the original idea on the science of movement, we acknowledge Harold Nicholas.

References

- Bull, P.E. (1987) 'The encoding of interest and boredom,' in *Posture and Gesture in International Series in Experimental Social Psychology*, vol. 16, M. Argyle (ed.) Oxford: Pergamon Press, pp. 53–61.
- Carriere, J.S., Seli, P. and Smilek, D. (2013) 'Wandering in both mind and body: Individual differences in mind wandering and inattention predict fidgeting'. *Canadian Journal of Experimental Psychology*, 67 (1) p. 19.
- Chalkley, J.D., Ranji, T.T., Westling, C.E., Chockalingam, N. and Witchel, H.J. (2017, September) 'Wearable sensor metric for fidgeting: screen engagement rather than interest causes NIMI of wrists and ankles'. In *Proceedings of the European Conference on Cognitive Ergonomics 2017*, pp. 158-161. ACM.
- Christian, M.S., Garza, A.S. and Slaughter, J.E. (2011) 'Work engagement: a quantitative review and test of its relations with task and contextual performance'. *Personnel Psychology*, 64, pp. 89–136.
- Coan, J.A. and Gottman, J.M. (2007) 'The specific affect coding system (SPAFF)'. In *Handbook of Emotion Elicitation and Assessment*, in Davidson R.J., Ekman, P. and Scherer, K. (eds.) *Series in Affective Science*, Oxford: Oxford University Press, pp. 267–285.
- Csikszentmihalyi, M. (1998) *Finding Flow: The Psychology of Engagement with Everyday Life*. New York, NY: Basic Books.

- D'Mello, S., Chipman, P. and Graesser, A. (2007) 'Posture as a predictor of learner's affective engagement', in *Proceedings of the 29th Annual Cognitive Science Society*, vol. 1 (Austin, Texas: Cognitive Science Society) pp. 905–910.
- D'Mello, S., Dale, R. and Graesser, A. (2012) 'Disequilibrium in the mind, disharmony in the body'. *Cognition and Emotion*, 26, pp. 362–374.
- Ekman, P. (1999) 'Basic emotions'. In Dalglish, T. and Power, M. (eds.) *Handbook of Cognition and Emotion*, John Wiley & Sons, pp. 45-60.
- Finn, J.D. and Zimmer, K.S. (2012) 'Student engagement: what is it? WHY does it matter?' In Christenson S.L. and Reschly A.L. (eds.) *Handbook of Research on Student Engagement*. New York: Springer, pp. 97–131.
- Galton, F. (1885) 'The measure of fidget'. *Nature*, 32, pp. 174-175.
- Grafsgaard, J.F., Boyer, K.E., Wiebe, E.N. and Lester, J.C. (2012) 'Analyzing posture and affect in task-oriented tutoring'. In *Proceedings of the Twenty-Fifth International Florida Artificial Intelligence Research Society Conference*. Palo Alto, CA: AAAI Press.
- Kahn, W.A. (1990) 'Psychological conditions of personal engagement and disengagement at work'. *Academy of Management Journal*, 33, pp. 692–724.
- Macey, W, and Schneider, B. (2008) 'The meaning of employee engagement', *Industrial and Organizational Psychology*, 1, pp. 3–30.
- O'Brien, H.L. and Toms, E.G. (2010) 'The development and evaluation of a survey to measure user engagement'. *Journal of the American Society for Information Science and Technology*, 61, pp. 50–69.
- Pease, A. and Pease, B. (2004) *The Definitive Book of Body Language: The Secret Meaning Behind People's Gestures*. London: Orion.
- Pekrun, R., Elliot, A.J. and Maier, M.A. (2006) 'Achievement goals and discrete achievement emotions: A theoretical model and prospective test'. *Journal of Educational Psychology*, 98 (3) p. 583.
- Russell, J.A. (1980) 'A circumplex model of affect'. *Journal of Personality and Social Psychology*, 39 (6) p. 1161.
- Sanghvi, J., Castellano, G., Leite, I., Pereira, A., McOwan, P.W. and Paiva, A. (2011). 'Automatic analysis of affective postures and body motion to detect engagement with a game companion', in *Human-Robot Interaction (HRI), 2011, 6th ACM/IEEE International Conference on IEEE*, Piscataway, NJ: IEEE, pp. 305–311.
- Seli, P., Carriere, J.S., Thomson, D.R., Cheyne, J.A., Martens, K.A.E. and Smilek, D. (2014) 'Restless mind, restless body'. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 40 (3) p. 660.
- Webster, J. and Ho, H. (1997) Audience engagement in multimedia presentations. *ACM SIGMIS Database*, 28, pp. 63–77.
- Witchel, H.J. (2013a) 'Engagement: the inputs and the outputs', in *Proceedings of Inputs-Outputs: An Interdisciplinary Conference on Engagement in HCI and Performance*. New York, NY: ACM.
- Witchel, H.J. and Westling, C.E. (2013b) 'Inputs and Outputs: engagement in digital media from the maker's perspective'. *Excursions*, 4, pp. 1–5. Available at:

<https://www.excursions-journal.org.uk/index.php?journal=excursions&page=article&op=view&path%5B%5D=80>.

- Witchel, H.J., Lavia, L., Westling, C.E.I., Healy, A., Needham, R. and Chockalingam, N. (2013c) 'Using body language indicators for assessing the effects of soundscape quality on individuals', in *AIA-DAGA Conference on Acoustics*. Berlin: Deutschen Gesellschaft für Akustik.
- Witchel, H.J., Westling, C., Tee, J., Healy, A., Needham, R. and Chockalingam, N. (2014a) 'What does not happen: quantifying embodied engagement using NIMI and self-adaptors'. *Participations*, 11, pp. 304–331. Available at: <http://www.participations.org/Volume%2011/Issue%201/18.pdf>.
- Witchel, H.J., Westling, C., Tee, J., Healy, A., Needham, R. and Chockalingam, N. (2014b) 'A time series feature of variability to detect two types of boredom from motion capture of the head and shoulders', in *ECCE 2014 Proceedings of the 32nd European Conference on Cognitive Ergonomics*. New York, NY: ACM.
- Witchel, H.J., Santos, C.P., Ackah, J.K., Westling, C.E. and Chockalingam, N. (2016) 'Non-instrumental movement inhibition (NIMI) differentially suppresses head and thigh movements during screen engagement: dependence on interaction'. *Frontiers in Psychology* (7) p. 157.

Biographies

Dr Harry J. Witchel is Discipline Leader in Physiology at Brighton and Sussex Medical School. His research concerns quantification of human movement, including gait, non-verbal behaviour, and communication. His next book, entitled *Writing for Biomedical Sciences Students* will be published in 2019 by Macmillan Education (formerly Palgrave Macmillan). His first book about the science of music, *You Are What You Hear*, was published in 2011 by Algora Publishing, New York.

Dr Carina E. I. Westling received her Ph.D. in Media and Cultural Studies at the University of Sussex. Her special interest is in the overlap of digital media and theatre. She is working on her book regarding digital media as related to her ethnographic research in the Punchdrunk theatre company.

Julian Tee and **Thomas Ranji** received their medical degrees from Brighton and Sussex Medical School.

Rob Needham is a Lecturer in Biomechanics at Staffordshire University.

Dr Aoife Healy is a postdoctoral researcher in Biomechanics at Staffordshire University.

Carlos P. Santos, **Dr K. James Ackah** and **Joe Chalkley** received their medical degrees from Brighton and Sussex Medical School.

Professor Nachiappan Chockalingam is the Director of the Biomechanics Facility and the Head of the University Professoriate at Staffordshire University.

Navigating learning during the first year at university for direct entry students

DR GILLIAN TEIDEMAN, SCHOOL OF SPORT AND SERVICE MANAGEMENT

Abstract

Research suggests that we have little understanding of how students conceptualise learning, how they develop as academic learners and cultivate the skills needed for success (Gale and Parker, 2014). This paper presents a summary of key findings emerging from a doctoral thesis where the purpose was to explore and gain insight into year 1 undergraduate Physical Education (PE) student experiences of learning, and develop understanding of the means by which students are supported in the transition to university.

The research adopted a qualitative approach where Interpretative Phenomenological Analysis (IPA) provided a methodological framework for the exploration of the individual [and shared] lived experience of the six research participants, using data collected through the use of semi-structured interviews. By interpreting the descriptions from individual students it was possible to understand how the cognitive, affective and social demands on learning are perceived in relation to the academic context. An aspect of this research was to find out whether students have the required skills to learn within higher education, looking beyond instrumental strategies and examining learning from a deeper, more personal perspective. Findings show the challenges that students encounter during the early stages of undergraduate study, and illustrate how pedagogic change needs to be aligned with opportunities for students to consider their own relationship with knowledge and its creation.

Keywords: Self, Becoming, Belonging, Motivation, Interpretative phenomenological analysis.

Introduction

Since the Dearing Report (NCIHE, 1997), the diversity of students accessing higher education has expanded. Research provided a wealth of information relating to the experience of specific target groups such as gender (Warin and Dempster, 2007) or mature access students (Haggis, 2007), but few considered the 18-21-year-old demographic, which was surprising, given that at the time of conducting this research, this constituted the majority (67 per cent) of the undergraduate population (HEA, 2010). Existing research also focused on specific aspects of learning: becoming an independent learner (Christie et al., 2013), capturing interest (Ainley, 2006) or finding a sense of 'fit' (Reay et al., 2010). There was a gap in the research that provided a more holistic perspective

of individual student experience that brought together the interconnected cognitive, affective and social dimensions of learning which this research addresses through its idiographic approach.

This paper describes and reflects upon themes emerging from a doctorate research study entitled 'Navigating learning during the first year at university for direct entry Physical Education students'. The term navigation refers to methods used to determine a position and plan a course to find one's way. As such, navigation encapsulates issues addressed throughout this study; it reflects the complexity of transition, anticipates the challenges and barriers encountered as students adapt to learning in higher education, and implies a journey.

Research methodology

This research sits within an interpretive paradigm where the attribution of meaning is a key factor in understanding phenomena (Crotty, 2011; Pring, 2006). The study is underpinned by Heideggerian phenomenology (2010) where 'Being-in-the-world' is regarded as the fundamental ontology. An individual is always a person-in-context, actively engaging with the already meaningful world (Larkin et al., 2006), but this is a reciprocal construct where involvement with the world gives [me] meaning. 'Being' is both situated and relational and my interest lies in finding out how the complex, often chaotic and unpredictable nature of learning is experienced at a personal level. In exploring student experiences of learning, it is necessary to locate the participant within the learning community. Epistemologically, I accept a social constructionist position where individual meaning is constructed and co-created through social interaction. Any concerns are shared with others; so any constructionists are expected to adapt and integrate with others, and any meaning is made in accordance with their relation to others (Schwandt, 2005; Moran, 2000).

The research employed Interpretative Phenomenological Analysis (IPA) methodology which draws on phenomenological (Heidegger, 2010), hermeneutic (Gadamer, 1979) and idiographic philosophies to 'explore, describe, interpret and situate' phenomena (Smith et al.; 2013, p.40). A purposive sample of six 18-21 year old undergraduate PE students were recruited and data was collected using semi-structured interviews conducted at three key points during their first year. IPA involves a systematic, step-by-step interrogation of transcripts 'moving from the particular to the shared, and from the descriptive to the interpretative' (Smith et al., 2013, p.79). The researcher sustains focus on the person-in-context, using an iterative and inductive cycle to capture the participants' subjective experience. Using a process of concept mapping (Novak, 1998) to distinguish patterns of convergence and divergence across the corpus, I identified four Recurrent Master Themes (RMT), Self, Becoming, Belonging and Motivation, alongside specific dimensions of each construct, illustrated in figure 1 (over).

Recurrent themes suggest universal and comparative experience but delving into the *particular* discloses the discrete and uniquely embodied nature of experience. The Venn diagram suggests that at any point in time each participant may occupy a different location based on their individual proximal and distal concerns.

The findings are too extensive to be addressed fully in this paper, but the following provides a summary of each RMT illustrated with participant quotes and analysis representative of the dialogue shared during the conference presentation.

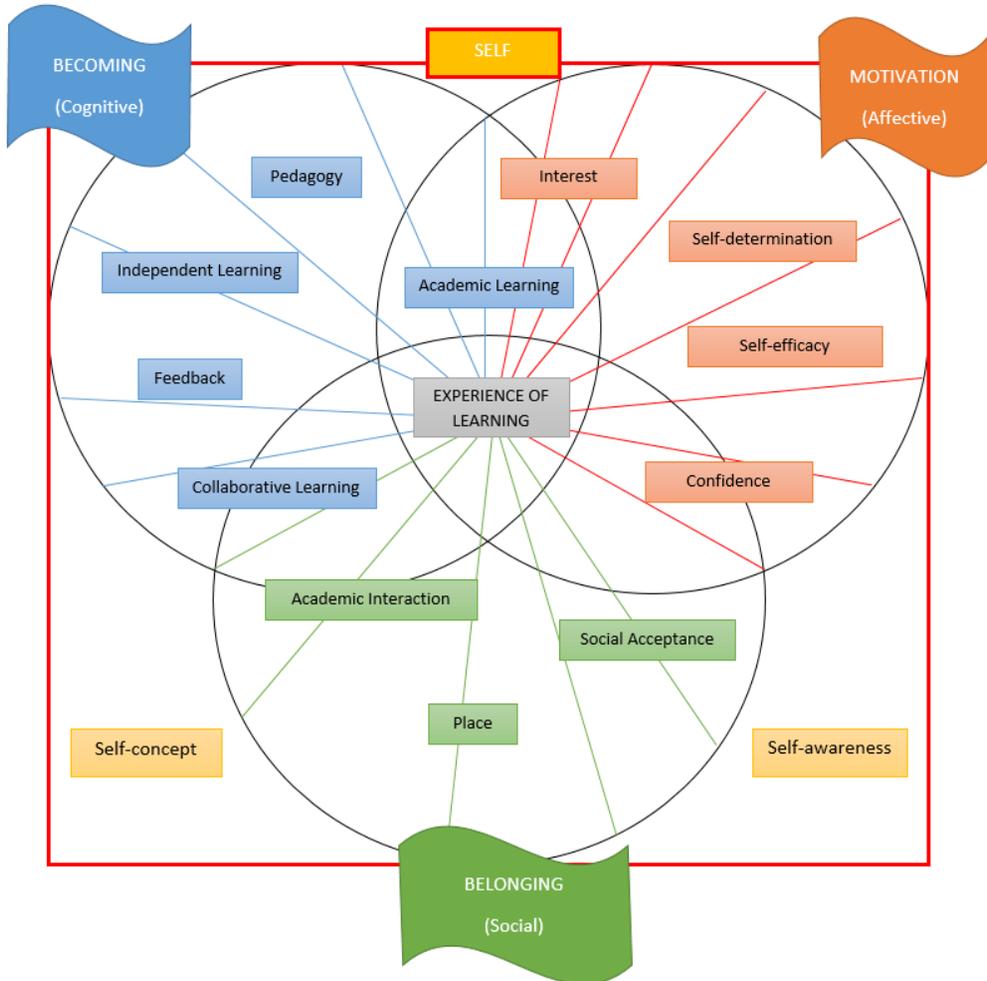


Figure 1: Year 1 Undergraduate Physical Education student experience of learning

Findings

Self

'Self' can be understood as the associated affective beliefs held by an individual that come into view by means of experience, and through which people make meaning of [their] world. Yet self does not exist in isolation; self comes into being through a world of relationships, echoing Heidegger's (2010) ontology of being-in-the-world, and as a point of reference, is partly defined by context and through comparison to others (Baumeister, 2011).

Learning is framed by Eddie's experience of an evolution of his academic and social self-concept. In the final interview, he makes a candid reference to the personal journey he has undergone, illuminating the sense of private change felt but also how he expects university to continue to shape his future.

'I am looking forward to finding my route, the route that I want to take. So, we have kind of done it a little bit by picking modules but just finding my route and then not so much sticking with my route but taking it all in, finding myself in terms of my future self, of what I want to do' [Eddie].

The confident tone of Eddie's words sits in contrast to the opening lines of his first interview where concerns about workload and Btec study methods are revealing in terms of his perceived academic competence upon entry to higher education. Eddie is conscious of his vocational background and appears to be preparing himself for the challenge ahead, which necessitates re-structuring ideas about his own capability. He needs to develop his study skills, specifically writing and referencing; thus, he attends closely to the advice given by lecturers, retaining this to help guide how he goes about a task, but his tone is positive and determined. Transition to university seems to be accompanied with a re-evaluation of how he should behave as a learner and during the first part of semester 1, he is willing to sacrifice the social 'fun side' of university and voluntarily isolate himself to concentrate on study. By accepting this position, Eddie is potentially alienating himself from peers and access to collaborative modes of learning, which he prefers. He enjoys the opportunity to articulate learning, finding reassurance through discussion; thus, it seems odd that he feels the need to forfeit this.

Eddie is less cautious with his module choices, purposefully selecting options that see him functioning outside of his comfort zone. Early feelings of isolation were perhaps necessary for him to be open to dance, an optional module on the PE degree; he had failed selection for the university hockey team and was living away from most of his cohort. Confronted by such significant disequilibrium, dance provided the emotionally, intellectually and socially supportive environment in which to construct a new sense of self. He feels pride in his success, but is also surprised by the impact that dance is having on how he experiences university. Eddie has realised that year 1 is a period where the foundations for learning are laid; exploring different areas of study will allow him to make informed choices in the future. This is a different outlook from the prevailing message that year 1 does not count towards the final degree mark, and he finds it difficult to resolve the decision by some of his peers to not engage with the opportunity to learn.

Fiona presents a contradictory self-concept; she is talkative yet quiet. There is an obdurate defiance towards pressure to conform; she resists the compulsion to engage with the social drinking culture and feels singled out for prioritising her studies. Associated bullying tests her resilience and when asked how she copes with difficulty, she tends to begin with a negative saying that she goes into meltdown before finding a positive, usually relating to her ability to adapt and achieve. Fiona's belief in her competence is tempered with doubt; she uses words such as 'I think I did alright' to confirm that her efforts have been acknowledged. Fiona describes feeling scared, daunted and nervous at the prospect of starting university and manages uncertainty by withdrawing.

'I don't feel like we get opportunities to say what we know, but I am 'oh I will just listen to everyone else' and I am ok just sitting here listening. I will speak up when I know something but because there is (sic) so many of us, I am sort of like, oh nobody cares what I think; I will just be in the background. Sometimes when I am a bit unsure of things I just close-up and let everyone else

do what they want to do. It is so easy to do in a group of 50 to just sit in the corner and pretend you are writing' [Fiona].

Fiona creates the illusion of engagement, and despite suggesting that she would like to contribute, class size and the idea that her views lack credence mitigate detachment. Although she has met many lovely people, the absence of companionship adds to her sense of isolation. When asked about critical moments, the response is 'building my confidence'. Bolstered by gaining a 2:1 in dance and possibly tired of feeling stifled, she uses a metaphor of breaking free from her shell, and when others threaten her potential to achieve worthy grades, she finds the strength to take control, adopting a mercenary stance towards university focused on maximising personal gain. Emotions define how Fiona engages with learning; she fears being singled out in a large lecture theatre, but within her direct cohort she begins to demonstrate the courage to voice her opinions.

Self contributes to understanding how each individual participant goes about learning and copes with the challenges of transition. Individual perceptions of self mediate learning behaviour; it influences decision making, personal orientation towards or away from opportunities and the regulation of emotions and action.

Becoming

Here 'Becoming' attends to how students 'go about learning'. When individuals engage with instrumental learning, choices for action are based on knowledge of the options available, possible consequences and deciphering the feedback or outcomes achieved (Mezirow, 1990). It involves learning to control and manipulate the environment and the people that inhabit it. Communicative learning is concerned with understanding the meaning of the way concepts, such as autonomy are implied by others (Mezirow, 1990). These assertions tend to be governed and normalised by the prevailing culture, and therefore require interpretation by a person new to the environment to achieve coherence.

Bob can be considered as coasting; doing enough to get by without stretching himself academically. Work completion rather than grade outcomes is the priority and he relies on his flatmates for direction in knowing where to pitch work or prepare for assessments. It is possible that Bob's background in team sports helped him to develop interpersonal skills, although he does not recognise this as a personal strength. There is a sense of collegiality and willingness to share. Bob appreciates the alternative perspectives provided by others; he feels secure in the value of his contribution and his effectiveness as a learner benefits from a feeling of mutual support:

'When we learn together, I quite like that because you are looking at someone else's point of view, like their perspective of things. So, it is not just mine, and then I can look at it from their point of view and be actually, maybe I am wrong. But if I say something and then someone is saying something else, I think it might be that then, I would be yeah, it might be that. I prefer working with people because I feel like it is not just me and I am not just relying on what I have learned, I can rely on what other people have learned as well. Then we can put the two together. I find it a lot better that way' [Bob].

Bob's readiness to be 'wrong' suggests he has a tacit level of criticality, which if nurtured through reflective practice could impact upon how he perceives and goes about learning more broadly. Despite his struggles, Bob is alert to apathy and determined to

capitalise on his opportunity. He is most effusive when talking about the impact physically experiencing theoretical concepts has on his understanding.

Clare appears self-reliant, ambitious, and effort for her, is a key characteristic necessary for learning. Clare has established a systematic approach to managing her study, structuring revision and methodically reducing notes to be 'on top' of things. Learning seems to be a laborious process and she consciously compares herself with others, implying competition may be a source of motivation but also a cause of anxiety. However, to fully engage in the meaning making process requires negotiation, yet she consciously avoids booking tutorials for fear of appearing 'dumb'. Her transcripts reveal an interesting distinction between the concept of independent learning and being self-taught; she feels abandoned and describes operating in a way that distorts the idea of independence, reducing it to an almost suffocating burden of autodidacticism;

'Extremely self-taught I think, more so this semester as I think we have had less lectures so it is like, ok so we are meant to teach ourselves certain things, which for certain parts I think is quite annoying. You are so used to having a bit more guidance but when you have not as much, it is a bit 'do we do this; do we do that?'. Then you don't want to ask ... I feel like I have been cut adrift' [Clare].

Adapting to this mode of working is overwhelming and Clare struggles to maintain a strong work ethic without sanctions for disengagement. Clare describes feeling guilty if she is not working, but the idea that year 1 does not count nags at her, and she is learning to accommodate her inclination to do too much or too little.

Belonging

'Belonging' acknowledges individual students' subjective feelings of acceptance and inclusion by others within a social environment (Kahu, 2014; Thomas, 2012). Drawing on Lave and Wenger's (1991) theory of 'Situated Learning', it is possible to view the participant accounts of their experience of learning as a socially mediated process that takes place within a framework of participation. Sense is made through interaction and learning; to become a student in higher education is fundamentally anchored in a social world.

A new entrant to university will encounter multiple communities, with embodied socio-cultural practices and institutional norms that are potentially difficult to understand, and challenging to navigate. The process and rate of transition is determined by personal needs and background; making connections and finding a sense of 'fit' can be a complex and challenging process (Kaighin and Croft, 2013; Reay et al., 2010). Belonging is in a constant state of flux; it is emotionally sensitive and framed by students' sense of self as they take on different roles and learn to navigate between macro and micro communities.

Alan provides a metaphor where he situates himself on a central island with different paths that connect him to a range of groups:

'You need to know what is available to you and being able to have bridges with peers, bridges with lecturers, and bridges with people in [canteen name]. The more relationships you have at university the easier; the more confident you would feel about your university degree' [Alan].

There are subtle differences regarding how Alan positions his sense of belonging. He admires and aspires to be like the senior students and so has ingratiated himself into their world. By cue seeking, he is gaining insider knowledge and a possible advantage over his peers through the access he has gained to the older students' experience. This relationship is significant, not simply for the practical help he gets in meeting learning challenges, but the status the connection affords. Alan is using his internal compass to guide interactions; he feels it is important to be noticed and he actively seeks relationships with lecturers as a method of coping with large-scale learning in a lecture theatre, which he finds impersonal and isolating.

The imagery he provides suggests he has developed the capacity to traverse these bridges in an intentional manner; effectively making choices about who he associates with to meet specific social, emotional or cognitive needs. This is a very strategic use of relationships and marks a significant shift since Freshers Week, where the focus was on developing friendships to building a network of communities that provide alternative contexts for engagement with learning, and ways of being in the social world.

The Dance Company engages Eddie with wider university activities through workshops and performances. The opportunity to represent the university in this ambassadorial role cements his commitment; he feels invested in and so, in turn, invests in the university. The language and tone of his words are extremely positive and the comparison to a youthful, boy band conjures an image of excitement and vitality:

'At first I didn't think I would have fitted in so well, but then stuff along the way has helped build up my confidence, being in [Dance Company] is probably the biggest one. Socially as a crew, we are really close now and I think, like I've had feedback from a performance and people will be like you didn't think we would be put together, it is a real 'One Direction' boyband moment; like I can't believe how well we get along already ... I feel like I belong, and as a peer group I definitely feel like I belong in the PE course itself. But I also feel like I belong in other areas as well, and that is due to ['Dance Company name'] [Eddie].

Growing confidence and finding a secure 'place' within the university community augments his sense of belonging and attachment to the wider institution. In terms of adapting to higher education, Eddie credits this to the independence he feels and his enjoyment of university living and learning.

Lave and Wenger (1991) present legitimate peripheral participation (LPP) as a conceptual bridge to question and gain insight into the dynamic and constant re-positioning of individuals as they develop understanding and become increasingly (or less) involved as members of a community. How a Community of Practice (COP) manages its boundaries affects access; thus, it would seem imperative that universities should work to provide entry routes and encourage students to invest themselves where the community enterprise best supports learning. In research (Masika and Jones, 2016; Kahu, 2014; Morison et al., 2013; Thomas, 2012), *belonging* is often aligned with *engagement*; the former precedes the latter with the likely outcome being improvements to learning and higher retention rates. Evidence from participant transcripts suggests this is potentially an optimistic alliance that should not be taken for granted. It is useful, therefore, to extend the concept of *belonging* to consider *not belonging* (Palmer et al., 2009; Solomon,

2007). If viewed as a continuum, new students enter university from a point of relative 'not belonging', and as they navigate through multiple social and academic communities, experience shifting participation that impacts upon their sense of self. Absent students still experience belonging to a COP where membership is characterised by peers also struggling to relate to a lecture and who find the content irrelevant. Institutions wishing to improve the student experience need to consider more closely the dominant student discourse associated with belonging, the impact upon choices made and subsequent (dis)engagement.

Motivation

'Motivation' can be understood in terms of the factors that give impetus to action. Self-determination theory (SDT) (Deci and Ryan, 1985) addresses the energisation and direction of behaviour *to do* something; this involves elements of choice, intention and decision making. It also positions individuals as agents, where self and environment intersect and are managed through a process of reflexive deliberation in the pursuit of learning goals (Zepke et al., 2010; Lockett and Lockett, 2009).

Alan's perspective at the early stage of year one is broadly one of completing his degree, superseded later by learning and grade outcomes. The end goal remains significant but he has had the opportunity to test himself against others and establish an understanding of the performance expectations set by the university. Although Alan sustains attention on his objective, he is conscious of being on a journey, referring to completing a mission, and his ability to be self-correcting becomes increasingly apparent in the growing competence he feels as a learner:

'Being here now and getting those sort of grades made me think: can I do this in that module or the next module? Always trying to think can I actually succeed in this module with a 1st or a 2:1 or a 2:2 and just try to get the best grade that I can get. Being able to get a 1st has made me think I can do anything if I set my mind to it'. [Alan].

Alan exhibits movement towards greater autonomy and self-regulation but he is dependent on extrinsic motivators such as knowing lecturers' standards. Alan sets targets based on an internalised sense of external expectations. He demonstrates growing self-efficacy, by reporting a change in his application during lecture theatre based learning and becoming more confident and interested in the content. However, the pressure he feels to meet externally imposed expectations, specifically grades, represents a situational control, which if left unattended, can result in compensatory or non-self-determined behaviour.

Clare's tendency to question her experience initially involved rationalising certain aspects of her learning but as the year progresses, her questioning becomes more pronounced. Clare's main concern relates to the accountability of lecturers. There is a noticeable discrepancy between the quality of interaction taking place in a practical environment, where staff make personal judgements about her learning and progress, compared to a lecture theatre setting. Clare wants to feel equality of investment in her learning; whilst she is making every effort to engage with her studies, she is dismissive of the perceived attitude of some lecturing staff, prompting questions about value for money.

'In 'practical' you are getting something from it; they can see you doing it and they can see if you get it or you don't. Whereas in a lecture, they don't know if you get it or you don't. It seems like they don't really care, they have ticked off their boxes of saying what they need to say, that's it, goodbye, done; finish ten minutes early, yeah, I get ten-minutes tea break or whatever. That's how it feels; and it feels like you are paying £9,000.00 to sit in a lecture hall and it doesn't feel you are getting your money's worth. It just feels like I could have missed this lecture and read up on it because I am just reading what he says'. [Clare].

An inconsistent lecture schedule and lack of guidance lead her to state 'we don't learn anything'. Clare is proud that she is working independently but feels this should not absolve the lecturers of their responsibilities, becoming irritated and frustrated by poor quality or lack of feedback received in some modules and from selected tutors. She has aligned herself with what she understands to be the correct way to go about learning in higher education and has bought in to the university, both literally via fees and conceptually. Clare is willing to engage with university learning and subscribes to the 'rules' of engagement; thus, when these are not adhered to, the disturbance is considerable.

Self-determination posits the needs of autonomy, competence and relatedness as mediating factors in how individuals cope with the stress of adaptation and demands of learning (Vallerand and Ratelle, 2002). This can be observed in the tensions that exist between extrinsic controls and intrinsic motives that influence regulatory behaviour and are impacted by changes in the perceived locus of causality (Deci and Ryan, 2002). Essentially, the participants want to be 'good at' and in control of their learning and futures; they derive satisfaction from an awareness of extending their capability, acknowledged via grades, feedback or an internalised sense of improvement. Feeling competent is a product of experience and associated affective initiators for action including interest, curiosity and enjoyment (Ainley, 2006). Students need to feel competent to function effectively as learners, but equally that progression needs to be challenged through pedagogy that is sensitive to stagnation and boredom.

The participant accounts demonstrate the interdependence of motivation and affect, underlining the role they play in the adaptive process. If our concerns rest with lack of student learning and disengagement, then it can be implied that their experience is not promoting positive feelings that encourage and inspire them to persist, be curious or aspire to learn. Understanding individual variance highlights the need for a student-centred approach to transition.

Discussion and recommendations

The findings from this research contribute to knowledge relating to how year 1 PE students experience learning in higher education. Analysis of the data illustrates that learning to learn in higher education may involve common praxis that can usefully be categorised, but how students adapt to the challenges encountered cannot be defined by homogenous groups (mature students, top-up, ethnic minority groups and so on); rather, each individual is precisely that, and should be treated as such.

Tensions between the relational and connected nature of experience are brought into view, highlighting the diversity within the sample group, stressing the need to think

about and attend to student concerns on a more personal basis. Findings show how critical situated and meaningful interaction is in fostering resilience, engagement and a sense of control over learning. However, academic expectations are not always obvious or explicitly understood by students, with certain pedagogic methods and limited contact with staff exacerbating feelings of anonymity and disconnection.

Students benefit from building social networks and where mechanisms exist to nurture interdependence within learning activities, affective gains are made that impact upon learning and promote a broader sense of wellbeing. There are examples of good practice that emerge from the data: practical pedagogies that are adapted for use in a lecture theatre, opportunities for collaboration, time to practise, embed and apply knowledge alongside timely and meaningful feedback are all cited in participant accounts. Yet experience is inconsistent and there is scope for improving practice and the institutional systems that underpin them.

Literature posits three broad categories relating to transition: induction, development and becoming (Gale and Parker, 2014; Quinn, 2010; Barnett, 2009). Induction and development are well accounted for in higher education research and reflect the approach seen in current university policy and practice. Set time frames attempt to predict when students may experience difficulties, and therefore determine when specific interventions are made; for example, feelings of homesickness are anticipated during the first six weeks with an additional 'pinch-point' for possible withdrawal, following the Christmas vacation. This research does not deny the value of anticipating general trends; rather, it points towards an oversight in practice, where adopting an implied view of transition to guide institutional policy perpetuates assumptions regarding how a student learns to navigate the changes associated with entering higher education.

The outcomes of this research challenge thinking regarding how higher education can adapt to the changing needs of students, rather than expecting students to adapt to established and traditional modes of working. *Becoming* recognises the complex, multi-faceted and individual nature of transition that may enable a more personal and flexible route to supporting student learning during the early stages of higher education. Adopting a transition as a 'becoming' perspective (Gale and Parker, 2014) challenges the idea that transition can be normalised and therefore supported by universal programmes of support, based on linear progression and set time frames outside of which the 'choppy waters' of change remain calm. Indeed, Quinn (2010) understands transition as a feature of everyday life, where individuals are continuously challenged to take on different roles. For the research participants, this is experienced not only with the movement between the social and learning environment, but is also felt in the way alternative 'selves' are enacted within lectures. The findings show that change is encountered in multiple ways, is layered, and the associated challenges and barriers are subjectively experienced by each participant. These are not time bound, nor are they characterised by impediment. It would be implausible to expect institutions to alter modes of working and micro-manage transition; but insight gained from this research can be used to initiate dialogue and help to inform objective decisions about how to best support students as they navigate learning during year 1.

The extent to which students are prepared for university varies, and their drawing upon school-based study habits to cope with the demands of learning is not sufficient. My key argument is that support needs to sit within a pedagogic framework that differentiates and personalises how students experience learning, and that is embedded

within the subject discipline. The research outcomes raise questions regarding how staff can change working practice during lecture time to mediate effective adaptation as a pre-emptive strategy to complement externally situated initiatives. I have ordered these into a series of recommendations (table 1), each underpinned by a develop-

Recommendation (discussion point)	Potential benefit to practice
<p>1 Encourage lecturing staff to adopt and implement student-centred pedagogy</p>	<ul style="list-style-type: none"> ▪ Facilitate integration into the academic learning community. ▪ Teach processes of reflection and meta-cognitive thinking, fostering student ability to work independently.
<p>2 Prioritise connectedness before autonomy in year 1.</p>	<ul style="list-style-type: none"> ▪ Underlining the importance of supporting students in the use and application of all forms of knowledge in diverse ways, contexts and for separate purposes.
<p>3 Identify where in practice emotional coping strategies can be enabled</p>	<ul style="list-style-type: none"> ▪ Student experience that foregrounds the development of emotional capital, equal to learning processes and skill acquisition will promote study habits that enable students to cope effectively with workload, stress and anxiety associated with learning in higher education.
<p>4 Be conscious of the counterpoint between inclusion or exclusion</p>	<ul style="list-style-type: none"> ▪ Inclusive pedagogy where entry points for learning participation are mediated and social networks are nurtured facilitate high quality interactions within the learning environment. This will enable possibilities for the negotiation of meaning and help nurture supportive, learning networks.
<p>5 Redress the balance between control and mastery orientation learning.</p>	<ul style="list-style-type: none"> ▪ The use of autonomy supportive pedagogy within different learning contexts where practice develops [rather than constrains] the internalisation of regulation. ▪ Situating opportunities for discussion, collaboration and the sharing of ideas in a facilitative experience where the modelling of forethought, performance and afterthought promotes self-efficacy and proactive learning behaviour.

Table 1: Recommendations for practice

mental theme, that can be used to prompt discussion or provide a starting point for further research that targets issues relating to transition, learning and retention in higher education.

Conclusion

The most important contribution to knowledge drawn from this research is the significance of ontology and how deeply being and becoming permeate the participants' experience of learning. What it means to 'become a learner' is dynamic, mirroring arguments made in this research that transition is an ongoing process, and demands awareness and openness to changes in being. Learning is an immersive, situated experience where co-constitution acts as a frame of reference for making sense of experience; therefore, how students cope with, engage and succeed in learning is both a matter of ontology and epistemology.

Bibliography

- Ainley, M. (2006) 'Connecting with Learning: Motivation, Affect and Cognition in Interest Processes', *Educational Psychology Review*, 18 (4) pp. 391-405.
- Baumeister, R.F. (2011) 'Self and identity: a brief overview of what they are, what they do, and how they work', *Annals of the New York Academy of Sciences*, vol. 1234, Issue 1: *Perspectives on the self*, pp.48-55.
- Christie, H., Barron, P. and D'Annunzio-Green, N. (2013) 'Direct entrants in transition: becoming independent learners'. *Studies in Higher Education*, 38 (4) pp. 623-637.
- Crotty, M. (2011) *The Foundations of Social Research*, London: Sage.
- Deci, E.L. and Ryan, R.M. (2002) *Handbook of Self-Determination Research*, New York: University of Rochester Press.
- Deci, E.L. and Ryan, R.M. (1985) *Intrinsic Motivation and Self-Determination in Human Behaviour*, New York: Plenum Press.
- Gadamer, H. (1979) *Truth and Method*, London: Sheed and Ward.
- Gale, T. and Parker, S. (2014) 'Navigating change: a typology of student transition in higher education', *Studies in Higher Education*, 39 (5) pp. 734-753.
- Haggis, T. (2007) 'Meaning, identity and 'motivation': expanding what matters in understanding learning in higher education?', *Studies in Higher Education*, 20 (3) pp. 335-352.
- Heidegger, M. (2010) *Being and Time* (translated by Stambaugh, J.) Albany: State University of New York Press. (Originally 1927 and published 1953 by Max Niemeyer Verlag.)
- Higher Education Academy (2010) *Social Class and Higher Education; A synthesis of research*. Available at: www.heacademy.ac.uk/assets/.../social_class_and_higher_education.doc.
- Kaighin, J. and Croft, W. (2013) 'The first year experience of social work students: Developing a 'sense of fit' and engagement with the profession. A Practice Report', *The International Journal of the First Year in Higher Education*, 4 (1) pp. 117-123.
- Kahu, E. (2014) 'Increasing the emotional engagement of first year mature-aged distance students: Interest and belonging', *The International Journal of the First Year in Higher Education*, 5 (2) pp. 45-55.

- Larkin, M., Watts, S. and Clifton, E. (2006) 'Giving voice and making sense in interpretative phenomenological analysis', *Qualitative Research in Psychology*, 3 (2) pp. 102-120.
- Lave, J. and Wenger, E. (1991) *Situated learning; Legitimate peripheral participation*, New York: Cambridge University Press.
- Luckett, K. and Luckett, T. (2009) 'The development of agency in first generation learners in higher education: a social realist analysis', *Teaching in Higher Education*, 14 (5) pp. 469-481.
- Masika, R. and Jones, J. (2016) 'Building student belonging and engagement: insights into higher education students' experiences of participating and learning together', *Teaching in Higher Education*, 21 (2) pp. 138-150.
- Mezirow, J. (1990) *Fostering Critical Reflection in Adulthood*. San Francisco: Jossey-Bass.
- Moran, D. (2000) *Introduction to Phenomenology*, London: Routledge.
- Morieson, L., Carlin, D., Clarke, B., Lukas, K. and Wilson, R. (2013) 'Belonging in education: Lessons from the Belonging Project', *The International Journal of the First Year in Higher Education*, 4 (2) pp. 87-96.
- National Committee of Inquiry into Higher Education (1997) *Higher Education in the Learning Society: Report of the National Committee* (The Dearing Report) London: HMSO.
- Novak, J. (1998) *Learning, Creating and Using Knowledge; Concept maps as facilitative tools in schools and corporations*. London: Lawrence Erlbaum Associates.
- Palmer, M, O'Kane, P. and Owens, M. (2009) 'Betwixt spaces: student accounts of turning point experiences in the first-year transition', *Studies in Higher Education*, 34 (1) pp. 37-54.
- Pring, R. (2006) *Philosophy of Educational Research*, London: Continuum.
- Quinn, J. (2010) 'Rethinking 'failed transitions' to higher education', in Ecclestone, K., Biesta, G. and Hughes, M. (eds.) *Transitions and learning through the lifecourse*, London: Routledge.
- Reay, D., Crozier, G. and Clayton, J. (2010) 'Fitting in' or 'standing out': working-class students in UK higher education', *British Educational Research Journal*, 36 (1) pp. 107-124.
- Schwandt, T.A. (2005) 'Constructivist, interpretivist approaches to human inquiry', in Denzin, N.K. and Lincoln, Y.S. (eds.) *The Sage Handbook of Qualitative Research* (3rd ed.) London: Sage.
- Smith, J., Flowers, P. and Larkin, M. (2013) *Interpretative Phenomenological Analysis; Theory, Method and Research*. London: Sage Publications.
- Solomon, Y. (2007) 'Not belonging? What makes a functional learner identity in undergraduate mathematics?' *Studies in Higher Education*, 32 (1) pp. 79-96.
- Thomas, L. (2012) *Building student engagement and belonging in higher education at a time of change: Final report from the What Works? Student retention and success programme*, London: Higher Education Funding Council for England.

- Warin, J. and Dempster, S. (2007) 'The salience of gender during the transition to higher education: male students' accounts of performed and authentic identities', *British Educational Research Journal*, 33 (6) pp. 887-903.
- Zepke, N., Leach, L. and Butler, P. (2010) 'Engagement in post-compulsory education: students' motivation and action', *Research in Post-Compulsory Education*, 15 (1) pp. 1-17.
- Vallerand, R.J. and Ratelle, C.F. (2002) 'Intrinsic and Extrinsic Motivation: A Hierarchical Model'. In Deci, E.L. and Ryan, R.M. (eds.) *Handbook of Self-Determination Research*. New York: The University of Rochester Press.

Biography

Dr Gillian Teideman is a Senior Lecturer and Course Leader for the BA (Hons) Physical Education degree at the University of Brighton. Gilly has research interests in higher education, which include undergraduate teaching, learning and the student experience. Gilly is a member of the Society for Research in Higher Education and the University of Brighton Phenomenology Specialist Interest Group.

Using interprofessional learning to develop professional understanding: the example of occupational therapy and physiotherapy

DR HAZEL HOROBIN AND SUE WHEATLEY, SCHOOL OF HEALTH SCIENCES

Abstract

Occupational therapists and physiotherapists work together in clinical settings to provide interprofessional treatment and care, but Aguilar et al., (2014) suggest that healthcare students appear to have difficulty understanding professional collaboration. Interprofessional learning can help to address this learning need and best prepare students for future clinical practice (Kowitlawakul et al., 2014).

Since January 2016, the occupational therapy and physiotherapy tutors at the School of Health Sciences have established a joint occupational therapy and physiotherapy interprofessional learning event to develop interview skills. The sessions were evaluated online and during classroom discussions. Overall, students felt that the experience was positive and beneficial and uni-professional discussions also generated more nuanced feedback.

This paper offers an evaluation of the planning, implementation and structure of the sessions in addition to staff and student evaluations. It is relevant to all those who are interested in the challenges to developing learning opportunities to explore and evaluate joint professional skills and roles.

Background

The delivery of modern healthcare is dependent on groups of trained professionals coming together and working as interdisciplinary teams (WHO, 2013). The consequences of inadequate collaborative working were highlighted in both the case of Baby P. (Laming, 2009) and the inquiry into the Mid Staffordshire NHS Foundation Trust, which produced the Francis Report (2013). Investigations into both these cases of inadequate health provision, identified how poor team-working and communication between professionals can have a hugely negative impact on the delivery of patient care. The causes of poor interprofessional working in health settings are numerous (O'Connor et al., 2016). However, some responsibility must also rest within the institutions that are training and preparing the next generation of clinicians, and consideration be given to how best to prepare health and social care professionals for their clinical specialism and for inter-professional practice. Helping healthcare professionals to learn to work together has been shown to be challenging, as healthcare students have difficulty understanding professional differences (Aguilar et al., 2014). However, interprofessional learning (IPL) can clarify uncertainties and facilitate collaboration (Kowitlawakul et al., 2014) as well as confirm student's own professional values (Hallin et al., 2009).

There are a number of policies at national and international level, that have been developed to support IPL in healthcare education, these include: The Health and Social Care Act (2012); National Collaboration for Integrated Care and Support (2013); Francis (2013); WHO (2009 and 2013). Both physiotherapists and occupational therapists have governing bodies, and the Health and Care Professions Council (HCPC) and their Professional Standards for Conduct also emphasise the importance of collaborative working between the professions to provide integrated, optimal and safe patient care (HCPC 2017a, College of Occupational Therapists 2014). Additionally, the HCPC state in their Standards of Education and Training that an education programme must 'ensure that learners are able to learn with, and from, professionals and learners in other relevant professions'. (HCPC, 2017b, p. 35).

Occupational therapists and physiotherapists frequently work in clinical practice to provide holistic care. They work very closely together, share responsibilities and can be managed across disciplines. Roles can even be temporarily interchangeable in some locations, such as integrated care wards, which offer inpatient services for the elderly and are characterised by their highly collaborative nature (Alderwick 2015). Clearly these professions could benefit from joint learning during training in order to prepare practitioners to function in this way. An assertion supported by social learning theory, since learning together supports the development of a shared understanding of practice (Chambers 2009).

Although there are IPL events within the School of Health Sciences at the University of Brighton, it was felt that this could be strengthened and occur at the start of student training, to allow for the development of interprofessional relationships at an earlier stage. A key challenge for IPL is making learning opportunities meaningful, given that barriers to joint teaching are often practical and organisational rather than conceptual (Buring et al., 2009). The challenge has been to develop an IPL experience that is more than just 'parallel learning', which could be described as where professionals are simply taught alongside each other in the same room. Another consideration for developing IPL opportunities is to enable both groups to receive the IPL at the 'right time'. The courses for both occupational therapists and physiotherapist are quite different in their overall structure. For example, occupational therapists go out on practice placements at a much earlier stage of their training than the physiotherapy students. Therefore, the timing of the IPL is crucial to enable the students to be on a par with each other in their development. After much discussion between the relevant staff members, it was felt that interviewing techniques were an area of clinical practice common to both professions and that the learning could be taught in an integrated way that could help facilitate understanding of the professional differences and similarities that exist between occupational therapists and physiotherapists.

Finding points where curricula 'meet' with shared content, can be thought of as a process setting practice into context. Exploring theoretical, professional unions and using these to expand on the issues of role overlap in practice, is how Chambers (2009) describes IPL as functioning best. This paper highlights one such meeting to show how, despite differences between cohorts, courses and professional cultures, students can learn professionally appropriate skills and attitudes. Through their meetings and discussions, they have an opportunity to recognise both professional similarities and differences of approach, learning with and from each other, arguably something beneficial to all.

Based on this understanding of the relevance of IPL, it was hoped that the teaching could offer students an opportunity to learn about interviewing and history taking with patients, and also to gain insights into each others' practice and foster the skills required for future team working. The sessions were structured to offer a mixture of joint and uni-professional teaching, that introduced and prepared students to address different approaches to professional interviewing.

The context

The University of Brighton has undergraduate healthcare professional courses for occupational therapy and physiotherapy. There are some similarities and many more differences within the course content, however, apart from content there are other significant differences. The occupational therapy course is part-time, consisting of two days a week over four years with placements throughout, and the physiotherapy course is full-time over three years with most placement experience in the final year. Course participants are different too, with the physiotherapy programme generally recruiting school leavers or those in their early twenties, whereas the occupational therapy programme tends to recruit more mature students who already have healthcare, and or family life experience. The numbers of students are also different with a rather larger physiotherapy programme cohort.

The pedagogy of both courses is also significantly different with a problem based approach used in the occupational therapy programme, and a more traditional style classroom delivery for the physiotherapy students. The timetabling of the planned IPL teaching was quite challenging as the occupational therapists were in university only two days per week and the days allocated for each cohort changed each year. Thus necessitating a redesign of the timetable and re-booking of rooms each year.

Designing the interprofessional learning event

This newly established IPL opportunity was not initially conceptualised as a research project, however, the authors of this paper still wanted to evaluate and disseminate the benefits, or otherwise, of student participation in the event. This text is an example of evaluative inquiry, motivated by a desire to understand the participants' experiences of a new approach to learning about a fundamental practice issue. Parallels can be drawn perhaps between this form of consideration of teaching impact and what would be considered 'service evaluation' in a healthcare setting. A qualitative approach was taken towards gathering data, as the authors wanted to elicit rich and nuanced data across the student body. We also wanted to be universal in our approach and encompass the totality of the learning experience, not solely the academic content, but also include a potential appreciation that there may be impacts for students of which we were unaware, or that they may be reluctant to share publicly. Due to these considerations, the approach this evaluation takes is one informed by a phenomenological perspective (Errasti-Ibarondo, 2018), since student experience is at its heart. The multiple staged evaluation was deliberately chosen to foster both pedagogic and evaluation aims. The first appraisal, in class during the event, was intended to encourage an ongoing collaboration of ideas and reflection on the experience of the role play. The second, online questionnaire was completed post session, individually, to give a more personal perspective. The final

evaluation was gained in verbal discussion in single profession groups, to elicit a more social or shared evaluation of the experience.

The two lecturers from the respective courses had previously never worked together and their experience of teaching differed. Before considering how to design the IPL event, it was necessary to contemplate not only the opportunities for learning that existed for the students, but also the range of skills that the two lecturers might be able to bring. In discussing possibilities for the event, a shared understanding regarding the relevance and importance of such working became apparent between the authors and a collaborative, non-judgemental relationship quickly developed, which according to Crow and Smith (2005), allowed for 'open' and reflective working and facilitated effective planning of the event.

To reduce the potential impact of the differences between the professional and pedagogic aspects of the two courses, careful consideration was given to allow the participants to feel confident both in their professional groups as well as working collaboratively. To meet this end, the session was structured into four sections which comprised both interprofessional and uni-professional segments.

The interprofessional event

On the day, the two professional cohorts met together, and the overall structure of the IPL event was outlined by the two physiotherapy and occupational therapy tutors including the structured role play. This aspect of a united introduction was important, as it modelled a collaborative approach and shared the working and enthusiasm for the project, which was felt essential both to support student understanding of the rationale for the session as well as their commitment to it.

During the second part of the session, the two disciplines subsequently separated and underwent a uni-professional introduction to interviewing techniques from their single professional perspectives. The aim was to allow the students some time to construct and reflect on their professional identity, as well as the skills that might be involved in the interaction, such as: active listening, establishing a therapeutic relationship and showing empathy. This was particularly important for the physiotherapy students as they had not yet been out on placement, and so had limited work experience on which to draw. In this part of the session students were shown a YouTube clip of a young man with Parkinson's disease and his partner, who talk about some of their everyday experiences of the condition (Infona001, 2013). Each professional group then considered ideas for their history taking.

Following this preparation, the students were then reorganised into smaller mixed professional groups of approximately six participants. Students were pre allocated to the groups and careful structuring was done for the interprofessional group ratio so that a division of 2:4 occupational therapy to physiotherapy students was achieved, and also to ensure that no occupational therapy student was left working alone.

The students took it in turns to role play an interview with a service user who has a diagnosis of Parkinson's disease similar to the situation shown in the YouTube clip. One student played the service user and another undertook an initial assessment. Turns were taken amongst the group participants to allow for a rotation of interviews played by physiotherapist and occupational therapist, with different students volunteering to take

on the role of the person with Parkinson's disease. This gave the students opportunities to demonstrate their newly acquired skills and insights into their different professional approaches to interviewing and assessment, whilst also being able to receive appropriate responses from the role play participant. This framed the activity as supported and supportive, one reason for avoiding sole professional representatives within the initial structuring and allocation of students to the groups

In the third part of the session, the students discussed the role play interviews witnessed and were asked to reflect, consider and give responses to a series of questions using the 'Poll Everywhere' survey platform. This platform was chosen because it is endorsed by the University of Brighton and has easy accessibility for students and staff. The reflective questions the students were asked to consider were as follows:

- Name up to three things that the interviewers did to make the interviewees feel relaxed.
- State up to three things that the interviewers did to elicit more information from the interviewees.
- List up to three differences between OT and PT approaches to interviewing
- Name one aspect of the approach to interviewing that the group liked, you should have a 'like' for a PT and an OT trait, and say why these traits were liked.
- Outline two things that your group has learned from this IPL event.

Students completed these questions together within their role play groups, and submitted answers gained through a consensus of opinion. There was a short break to allow for student comfort and travel back to the original classroom where the joint introductory session had been delivered.

In the fourth and final part of the IPL event, the full cohorts of reunited students viewed the online results of their Poll Everywhere feedback. Student answers to questions were displayed on the lecture theatre screen and discussion within the interprofessional group was facilitated by the tutors.

Data generated and discussion

In class

The following are examples of what students said they learned about each others' practice from the IPL event:

'That we need to work together to get best outcomes'.

'PT and OT are inter-related and together can achieve holistic care'.

'Physios are nice really. OTs don't just supply equipment'.

'Interprofessional education and humility'

'Need to find out more about cross of roles. Building relationships helps. Maybe a joint interview'.

'The importance of multi-disciplinary team and multi-disciplinary team based learning approaching'.

'Similarities in questions. Importance of sharing info'.

'That the two professions work well together to gain information from the patient. It's difficult to role play these situations as the interviewee doesn't really know how the patient should be feeling, and therefore there is not a lot of information there to act as points for further questioning'.

Whilst these comments might appear highly positive, they offer a realistic representation of the cohorts attitudes contained in their feedback during the class. It is possible that they were aware of the learning outcomes for the event or aware of current working discourses supporting interprofessional working, and students were keen to demonstrate to staff and each other, their understanding of the issues. Equally they may have been eager to leave the class, after what had been a relatively intellectually challenging event, where not only were they learning about a new process (interviewing), but also had to draw upon their social skills and meet new students from a different profession. However, they do demonstrate development of ideas beyond those previously presented by the staff in the uni-professional sessions, and this suggests that deeper engagement was achieved for at least some students.

Reflection is a strong part of the professional requirements for both occupational therapy and physiotherapy (HCPC 2017a and b). The task demanded that these students not only reflect on their experiences, but also do this as a joint endeavour. This further facilitated the IPL opportunities and gave another opportunity for learning a new skill together and to achieve this jointly across their professional boundaries.

The students' replies to questions were shown in class and on screen, and this may have impacted on the narratives they were prepared to share. However, other researchers such as Ruebling et al., (2014) and Darlow et al., (2015) found similarly positive, student responses to IPL in their research, despite their data being less publicly visible to the participant students.

The alternative to the positive aspects of interprofessional working, and potentially the reason why it is difficult to achieve, is that where there are shared roles, there can also be tensions of role overlap. Hall (2005) explores some of the different working cultures associated with different professions, but generally, pressures exerted by the expression of different professional identities are not always well explored. Interestingly, there is perhaps some indication of interprofessional assumptions already developing in the first semester of study about the approaches of people who work in the different professions. For example, in one of the responses, where physiotherapists are noted as 'being nice really'. Generally though, the session ended with positive affirmation on both sides regarding joint working, and also respecting and valuing difference.

Post class

There was a post session online evaluation of the whole of the IPL event. Generally, the feedback from individual participants was positive. The following were typical responses:

'It was very nice to have some time to familiarise ourselves with the profession of occupational therapist. The way they led their interview was focused on lifestyle and quite different from our interview, even though there

were a lot of overlaps. I am glad I came to this session because I think it is extremely important to create this communication between the different healthcare professionals we will be working with’.

‘It was really good to meet the physiotherapy students and see how important it can be for professionals to work together’.

‘Could do with some more sessions like this. I enjoy understanding another profession that I may work with’.

‘For me the timing was really good as it gave a wider perspective on the work that physios and OTs do, which I have lost lately because of concentrating on revision (not seeing the forest for the trees!).

‘I found it motivating to have a reminder of why I am doing this course’.

The quotes continue to indicate a high level of appreciation for the learning event in the individual responses from the students. There is a recognition of the relevance of the session to their learning and an acknowledgement of the professional importance. The relevance of the session also appeared to act as a motivation for further insights and understandings of IPL and interdisciplinary working for future clinical practice. This positivity reflects the findings of other studies investigating the student experience of IPL (Dreier-Wolfgramm, 2018). However, further research is required to explain the construct underpinning these student comments. Other literature shares this issue however, as it appears to largely express the results, either through simple description, (for example, Clark et al., 2015: learning was transformative/effective) or in an empirical way (for example, the Likert scale employed by Bajorek et al., 2015).

Some students indicated that they were not completely happy with the timing of this event within the overall course structure (pressures of other work, submissions etc.):

‘Maybe at a more appropriate time next year as it is so close to [the] exam’.

Great care and consideration was given to the planning and timing of this learning opportunity, but there were challenges in working with two separate timetables which also included students going on placement and the part-time nature of one of the courses. It is well recognised that undertaking IPL is challenging to organise (Reid, 2018). It is perhaps for this reason that much current literature focuses on student preparation for IPL, supporting the clinical arena where this work happens naturally, rather than the evaluation of these events (Aronoff et al., 2017; Maharajan et al., 2017), given the difficulty of development and delivery on campus.

Additionally, the tutors discussed with students in their uni-professional groups how they felt about the session. In this evaluation around a week after the event, there was more nuanced comment offered, and it became apparent that the students approached the role play task with varying degrees of maturity and self-awareness. Due to different course demographics: there are variations in age, and some students already have more work placement and other learning experiences than others. Reid (2018) has suggested that a negative aspect of IPL is the unintentional reinforcement of professional stereotypes unless care is taken in the structuring of engagements. The close involve-

ment of two members of staff helped to prevent this from occurring in this IPL event and each of the small 'role play groups' were visited and the members supported.

Conclusion

This paper considers the practice of IPL with the overall aim of addressing some of the identified issues in clinical practice relating to challenges to effective interprofessional working, which can have far reaching impacts on service user care. The future of health-care depends on the skills and abilities of the professionals who are working within it. Brown et al., (2017) highlight the need to develop not only the relevant 'hands on' clinical skills, but also the ability to work in teams and across professional boundaries; and that students need to be exposed to this at an early stage of their training. This IPL event took place at the end of the first semester during the first year of the courses. This could be considered a strength of the event as it developed a culture of interprofessional learning and development that enabled students to be more 'open' to such events at later stages of their courses. However, despite the differences between these students in terms of their professional disciplines, ages and clinical experience, both groups felt that they benefited in many ways in terms of their understanding of each other's roles and approaches.

A further interesting by-product of the development of this IPL event is that it has also fostered links across the professional boundaries between the different lecturers and students within the School of Health Sciences. These relationships have the potential to also provide a foundation for further collaborative working and the strengthening of IPL philosophy within the school. Students describe value and benefits, for example, a physiotherapy student spontaneously said at a School of Health Sciences Open Day how much they valued the IPL event, describing it as a highlight of the first year. Students also described the session's impact as fostering stronger collegiality and school identities for students on campus. They described how they now recognise each other and staff in the library and refectory, which is something they value. Strong campus and professional identities have been shown to relate to the development of resilience in health workers (Fernandes and Souza, 2017), but this aspect is also of interest to universities, given the perceived function of course and location identities within student experience surveys, such as the National Student Survey (Sabri, 2013).

This IPL event has been a learning and development opportunity for both the staff and students involved. It provided meaningful understanding of the similarities and differences of the approaches of two allied health professions to performing initial assessments. It allowed the students at an early stage of their professional careers to begin to appreciate not only the process of interviewing, but also the complexity of working interprofessionally on a common task. In addition, they were exposed to joint reflection and learned to express their ideas within and with a team. The two courses plan to build on their IPL opportunities and are currently the first year students now also working on new projects such as 'Time for Dementia'. It is hoped that these events will foster not only a sense of interprofessional identity within the university, but also into future practice for all physiotherapy and occupational therapy clinicians who have trained at the University of Brighton.

Denzin suggests that 'we cannot afford to fight with one another ... We need to find new strategic and tactical ways to work with one another'. (Denzin, 2008, p. 321). The

authors of this paper suggest that we also need to find new *practical* ways to achieve this, and that the development of IPL events and the strengthening of relationships and learning fostered across the staff and students in the School of Health Sciences has assisted with this aim, and has resonance for the quality of future healthcare delivery.

References

- Alderwick, H. (2015) *Acute hospitals and integrated care: from hospitals to health systems*. Available at: <https://www.kingsfund.org.uk/audio-video/hugh-alderwick-acute-hospitals-and-integrated-care>.
- Aguilar, A., Stupans, I., Scutter, S. and King, S. (2014) 'Exploring how Australian occupational therapists and physiotherapists understand each other's professional values: implications for interprofessional education and practice'. *Journal of Interprofessional Care*, vol. 28, no. 1, pp. 15-22.
- Aronoff, N., Stellrecht, E., Lyons, A., Zafron, M., Glogowski, M., Grabowski, J. and Ohtake, P. (2017) 'Teaching evidence-based practice principles to prepare health professions students for an interprofessional learning experience', *Journal of the Medical Library Association*, vol. 105, no. 4, pp. 376-384.
- Bajorek, B.V., Lemay, K.S., Magin, P.J., Roberts, C., Krass, I. and Armour, C.L. (2015) 'Preparing pharmacists to deliver a targeted service in hypertension management: Evaluation of an interprofessional training program', *BMC Medical Education*, vol. 15, no. 1, pp. 157.
- Brown, T., Etherington, J. and Williams, B. (2017) 'Emotional intelligence and personality traits as predictors of undergraduate occupational therapy students' teamwork skills: A cross-sectional study'. *The British Journal of Occupational Therapy*, SAGE Publications, 80 (7) pp. 432-9.
- Buring, S.M., Bhushan, A., Broeseker, A., Conway, S., Duncan-Hewitt, W., Hansen, L. and Westberg, S. (2009) 'Interprofessional education: definitions, student competencies, and guidelines for implementation'. *American journal of pharmaceutical education* 73 (4) p. 59.
- Chambers, M., Hickey, G., Borghini, G. and McKeown, R. (2009) *Preparation for practice: The role of the HCPC's standards of education and training in ensuring that newly qualified professionals are fit to practise*. London: Kingston University and St George's University.
- Clark, M., McKague, M., Ramsden, V.R. and McKay, S. (2015) 'Deeper Learning through Service: Evaluation of an Interprofessional Community Service-Learning Program for Pharmacy and Medicine Students', *Journal of Research in Interprofessional Practice and Education*, vol. 5, no. 1.
- College of Occupational Therapists (2014) *College of Occupational Therapists' learning and development standards for pre-registration education*. London: College of Occupational Therapists.
- Crow, J. and Smith, L. (2005) 'Co-teaching in higher education: reflective conversation on shared experience as continued professional development for lecturers and health and social care students'. *Reflective practice* 6 (4) pp. 491-506.

- Darlow, B., Coleman, K., McKinlay, E., Donovan, S., Beckingsale, L., Gray, B., Nesar H., Perry, M., Stanley, J. and Pullon, S. (2015) 'The positive impact of interprofessional education: a controlled trial to evaluate a programme for health professional students'. *BMC Medical Education*, 15 (1) p. 98.
- Denzin, N.K. (2008) 'The new paradigm dialogs and qualitative inquiry'. *International Journal of Qualitative Studies in Education* 21, pp. 315-25.
- Dreier-Wolfgramm, A., Homeyer, S., Oppermann, R.F. and Hoffmann, W. (2018) 'A model of interprofessional problem-based learning for medical and nursing students: Implementation, evaluation and implications for future implementation', *GMS Journal for Medical Education*, vol. 35, no. 1, pp. Doc13.
- Errasti-Ibarrondo, B., Jordán, J.A., Díez-Del-Corral, M.P. and Arantzamendi, M. (2018) 'Conducting phenomenological research: Rationalizing the methods and rigour of the phenomenology of practice', *Journal of Advanced Nursing* vol. 74, no. 7, pp. 1723-4.
- Fernandes, C., Da Silva, N., Souza, M., De Mello, E. (2017) 'Teaching in higher education in nursing and identity construction: entry, career and permanence', *Revista Gaucha de Enfermagem*, vol. 38, no. 1.
- Francis, R. (2013) *Report of the Mid-Staffordshire NHS Foundation Trust Public Inquiry*. London: The Stationery Office.
- Hall, P. (2005) 'Interprofessional teamwork: Professional cultures as barriers'. *Journal of Interprofessional Care*, 19 (sup 1) pp.188-196.
- Hallin, K., Kiessling, A., Waldner, A. and Henriksson, P. (2009) 'Active interprofessional education in a patient-based setting increases perceived collaborative and professional competence'. *Medical teacher* vol. 31, no. 2, pp. 151-157.
- Health and Social Care Act 2012. Available at: <http://www.legislation.gov.uk/ukpga/2012/7/contents/enacted>.
- Healthcare and Professional Council (2017a) *Standards for Education and Training Guidance* London: HCPC.
- Healthcare and Professional Council (2017b) *Standards of conduct, performance and ethics*. London: HCPC.
- Infona001 (2013) *Early Onset Parkinson's* (online video) Available at: https://youtube/KmK3mKTud_8.
- Kowitlawakul, Y., Ignacio, J., Lahiri, M., Khoo, S.M., Zhou, W. and Soon, D. (2014) 'Exploring new healthcare professionals' roles through interprofessional education'. *Journal of Interprofessional Care*, vol. 28, no. 3, pp. 267-269.
- Maharajan, M., Rajiah, K., Khoo, S., Chellappan, D., De Alwis, R., Chui, H., Tan, L., Tan Y. and Lau., S. (2017) 'Attitudes and readiness of students of healthcare professions towards interprofessional learning', *PLoS ONE*, vol. 12, no. 1, pp. e0168863.
- National Collaboration for Integrated Care and Support (2013) *Integrated Care and Support: Our Shared Commitment*. London: Department of Health and Social Care.
- O'Connor, P., O'Dea, A., Lydon, S., Offiah, G., et al. (2016) 'A mixed method study of the causes and impact of poor teamwork between junior doctors and nurses'. *International Journal for Quality in Healthcare*, 28 (3) pp. 339-345.

Reid, A., Fielden, S., Holt, J., MacLean, J. and Quinton, N. (2018) 'Learning from interprofessional education: A cautionary tale'. *Nurse Education Today*, vol. 69, pp. 128-133.

Ruebling, I., Pole, D., Breitbach, A., Frager, A., Kettenbach, G., Westhus, N., Kienstra, K. and Carlson, J. (2014) 'A comparison of student attitudes and perceptions before and after an introductory interprofessional education experience'. *Journal of Interprofessional Care*, 28 (1) pp. 23-27.

Sabri, D. (2013) 'Student evaluations of teaching as 'fact-totems': The case of the UK national student survey'. *Sociological Research Online*, vol. 18, no. 4, p. 1.

World Health Organisation (1988) *Learning Together to Work Together*. Geneva: WHO.

World Health Organisation (2013) *Health workforce: nursing and midwifery*. Geneva: WHO.

Biographies

Dr Hazel Horobin: After qualifying as a physiotherapist from the Queen Elizabeth School of Physiotherapy in 1984, Hazel specialised in respiratory physiotherapy and worked on the liver transplant unit at the Queen Elizabeth Hospital, Birmingham. Subsequently she travelled to work on a leprosy control, community based project funded by the UNAIS, based in the Amazon region of Brazil. On returning to the UK she took up a teaching post at Sheffield Hallam University. Here she progressed to lead the Faculty of Health and Wellbeing where she coordinated improvements in student experience and developed service user involvement in education. Hazel moved to the University of Brighton in 2014 to develop further research opportunities. She was awarded a professional doctorate (EdD) in 2016 for her thesis, entitled: 'The Meeting of Cultured Worlds: Professional Identification in Indian Postgraduate Physiotherapy Students'. For this study, she was awarded a UKIERI scholarship in 2012.

Publications include: with Viv Thom, 'Starting with Transitions: Internationalisation for a Post Graduate Physiotherapy Course'. In: Green, W. and Whitsed, C. (eds.) (2015) *Critical Perspectives on Internationalising the Curriculum in Disciplines*.

Sue Wheatley qualified as an occupational therapist in 1988 and practiced in mental health and substance misuse settings. Since gaining an MA in Health Promotion in 1996, she has worked at the University of Brighton on both the MSc and the BSc courses in occupational therapy. Her interests include problem based learning, the use of technology as a therapeutic intervention and the role of occupational therapy in public health.

Centre for Learning and Teaching | 
Watson House
University of Brighton
Brighton BN1 9PH

[https://staff.brighton.ac.uk/clt/
Pages/Research/publications.aspx](https://staff.brighton.ac.uk/clt/Pages/Research/publications.aspx)

Printing: Gemini Press
www.gemini-press.co.uk
Design: Lynda Marshall