The Flipped Classroom, Disruptive Pedagogies, Enabling Technologies and Wicked Problems: Responding to 'the Bomb in the Basement'

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Abstract: The adoption of enabling technologies by universities provides unprecedented opportunities for flipping the classroom to achieve student-centred learning. While higher education policies focus on placing students at the heart of the education process, the propensity for student identities to shift from partners in learning to consumers of education provides challenges for negotiating the learning experience. Higher education institutions (HEIs) are grappling with the disruptive potential of technology-enabled solutions to enhance education provision in cost-effective ways without placing the student experience at risk. These challenges impact on both academics and their institutions demanding agility and resilience as crucial capabilities for universities endeavouring to keep up with the pace of change, role transitions, and pedagogical imperatives for student-centred learning. The paper explores strategies for effective change management which can minimise risk factors in adopting the disruptive pedagogies and enabling technologies associated with 'flipping the classroom' for transformative learning. It recognises the significance of individual, cultural and strategic shifts as prerequisites and processes for generating and sustaining change. The analysis is informed by the development of a collaborative lifeworld-led, transprofessional curriculum for health and social work disciplines, which harnesses technology to connect learners to humanising practices and evidence based approaches. Rich data from student questionnaires and staff focus groups is drawn on to highlight individual and organisational benefits and barriers, including student reactions to new and challenging ways of learning; cultural resistance recognised in staff scepticism and uncertainty; and organisational resistance, recognised in lack of timely and responsive provision of technical infrastructure and support. Intersections between research orientations, education strategies and technology affordances will be explored as triggers for transformation in a 'triple helix' model of change, through examining their capacity for initiating 'optimum disruption' to facilitate student-centred learning, role transitions, and organisational change. We share the findings of 'our story' of change to harness the positive utility of these triggers for transformation through deploying strategies for negotiating complexity, including the requirement for a shared vision, a robust team approach, the need for ongoing horizon scanning and application of soft skills (e.g. active listening, timely communication) necessary in order to build student confidence, academic partnerships, and facilitate organisational dexterity and resilience in the face of barriers to change.

Keywords: Transformative learning; change management; flipped classroom, technology-enabled learning; role transitions; organizational change

1. Introduction

The challenges for universities to survive and prosper in the early 21st century are highlighted by Shore's argument (2010, p.15) that 'a new set of discourses has emerged around universities and their role that draws together different, often contradictory, agendas' heralding 'a shift towards a new, multi-layered conception in which universities are expected to fulfil a plethora of different functions'. Echoing Dolence and Norris's (1995) manifesto for transforming higher education, to redesign, refine and realign, within this complex and competitive climate, HEIs must engage in innovative strategies to advance research, education and professional practice while continuing to place students at the heart of the education process. These demands impact on individuals and organisations, necessitating both agility and resilience in strategic, business and cultural domains (Mukerjee 2014). If the university is to respond effectively to the pace of change it must reshape and reinvent its core business model while also seeking new future-oriented business. This entails

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managing, role transitions, and pedagogical imperatives which offer value propositions to shift to more student-centred, immersive learning experiences, deep faculty/student relationships and the development of critical thinking capacities which remain risk-free for the student experience (Mukerjee 2014; Norris et al 2012).

Norris et al. (2012 p.19), referring back to Dolence and Norris (1995) argued that 'global society was undergoing a fundamental transition from the Industrial Age to the Information Age and that 'For higher education, this translated into using Information or Knowledge Age tools – pervasive information and communications technology – to meet the needs of this New Age: universal learning throughout life, personalized and suited to current needs.' Universities are embracing technologies to facilitate teaching and learning, simultaneous with the growing use of mobile and digital technologies in students' everyday lives. Lea and Jones (2011, p.378) suggest 'the potential of social networking, digital and mobile technologies are permeating the academy, not only through student practice but in terms of dominant institutional drivers and government-led funding to harness technologies and applications for supporting teaching and learning'. Enabling technologies offer potential for enhancing student learning within the complexity and demands of HE provision by crossing boundaries between research and practice, creating opportunities for co-construction of knowledge, and releasing academic staff potential to engage with a rebalanced workload in research, education, and professional practice. But while change in higher education is endemic, technology-enabled initiatives can contribute to the complexity and pace of these changes. Mukerjee (2014, p.56) argues "the digital world is driving innovation and continuous change at such a rapid and random rate that universities are struggling to keep up with demand". These developments require detailed organisational planning, co-ordination and resourcing (Breen et al 2001) to assure effective change management and minimise risks. This is not to suggest that change can be managed scientifically in a rational, ordered and linear fashion with appropriate planning tools and resources in place. The reality of change may be experienced by different stakeholders as an amalgam of more disjointed and disruptive processes. Initiators of innovative technology enabled strategies, offering new mixes of tutor-facilitated and student-managed learning, can encounter resistance to change manifested at individual and organizational levels where these developments challenge deeply held beliefs and pedagogic practices (Greener 2009, 2010a. p.188).

2. Theoretical framework

While universities have been engaging with digital technologies to support education provision since the development of virtual learning environments (VLEs) in the 1990s, the rapid growth and widespread uptake of mobile devices and potential for ubiquitous connectivity, as ubiquitous mobile moves towards ubiquitous broadband (International Telecommunications Union 2013), offer unprecedented opportunities for using the time and space available for teaching and learning differently. 'Flipping' the classroom is one such phenomenon which captures this potential (Baepler et al 2014; Kim et al 2014; Moffett and Mill 2014; Strayer 2012; Westermann 2014). The 'flipped' classroom is usually associated with providing course materials, frequently in the form of videoed lectures, for students to engage with outside the classroom, enabling in-class time to be repurposed for student-centred collaborative learning activities that build on the learning resources provided. It has been argued that the flipped classroom enables a shift away from traditional information-transmission, teacher-led lectures where students sit and listen as passive learners, to offer an active and collaborative learning environment, where students assimilate knowledge through application and evaluation, more conducive to facilitating deeper approaches to learning through encouraging higher order critical thinking and creativity (Mazur 2009; Wallace et al 2014; Westermann 2014).

Rather than interpreting the 'flipped classroom' narrowly and simply as a process of inversion, where content is delivered outside the class and learning activities within the class, we have adopted a broader, more inclusive definition, which sees the phenomenon of 'flipping the classroom' as a powerful threshold concept and catalyst for change within the tradition of hybrid or blended learning approaches, which combine the strength of face-to-face and technology enhanced learning (Picciano 2014). Following Strayer's argument (2012), what distinguishes 'flipping the classroom' from the normal practices of teachers who support their classes with readings and resources is where the technology affordances are being used regularly and systematically to provide and support a disruptive pedagogy. Kim et al (2014, p.38) highlight the value of considering 'unique interpretations' of flipping the class and investigating their respective strategies to assist the design of "better learning environments in which students can be more engaged, active, and responsible for their learning".

But research on enabling technologies for education tends to concentrate on benefits and outcomes rather than examining evidence of processes and people at work in the disjuncture, flux and movement within education initiatives. Pennington (2003, p.4) highlights the tensions between outcomes and process orientations:

> Structures, procedures, attitudes and behaviours underpinning the status quo have often taken years to lay down and are not susceptible to overnight transformations. For this reason the introduction and management of change should be conceived as a rolling process requiring subtle and persistent choreography rather than a defined event occurring at a particular moment.

We believe the notion of the positive utility of resistance to change should not be overlooked and can be explored and better understood in order to implement change successfully. Understanding transformative learning at individual and organizational levels, and acknowledging and working with resistance, reluctance and pedagogic diversity is at the heart of negotiating change creatively and sensitively. This position acknowledges the importance of context and situated learning (Argyris & Schön 1978, Lave & Wenger 1991) and builds on social-constructivist (Mayes & Freitas 2007) and experiential learning theory (Dewey 1933, 1938). The utility of generating purposeful disruptions as tensions and challenges to stimulate transformative learning has been considered elsewhere (Hutchings, Scammell & Quinney 2013). While recognising the value of education initiatives as levers for transformation and organisational change, we also recognise the challenges for change agents in attempting to achieve 'optimum disruption' where initiatives are experienced as too uncomfortable, too difficult or simply too unwelcome and therefore resisted or rejected (Hutchings, Quinney & Scammell 2010a).

This paper shares 'our story' of negotiating change in the development of a collaborative lifeworld-led transprofessional curriculum for health and social work disciplines. Our purpose is to explore the intersections between three strands, (1) research orientations, (2) education strategies, and (3) technology enabled learning, described as the 'triple helix', through their capacity for initiating 'optimum disruption' towards both transforming the student learning experience and academic and organisational cultures (See Figure 1). We will examine strategies deployed for negotiating complexity, including the requirement for a shared vision, a robust team approach, the need for ongoing horizon scanning and application of soft skills (e.g. active listening, timely communication) necessary in order to build student confidence, academic partnerships, and facilitate organisational dexterity in the face of barriers to change.

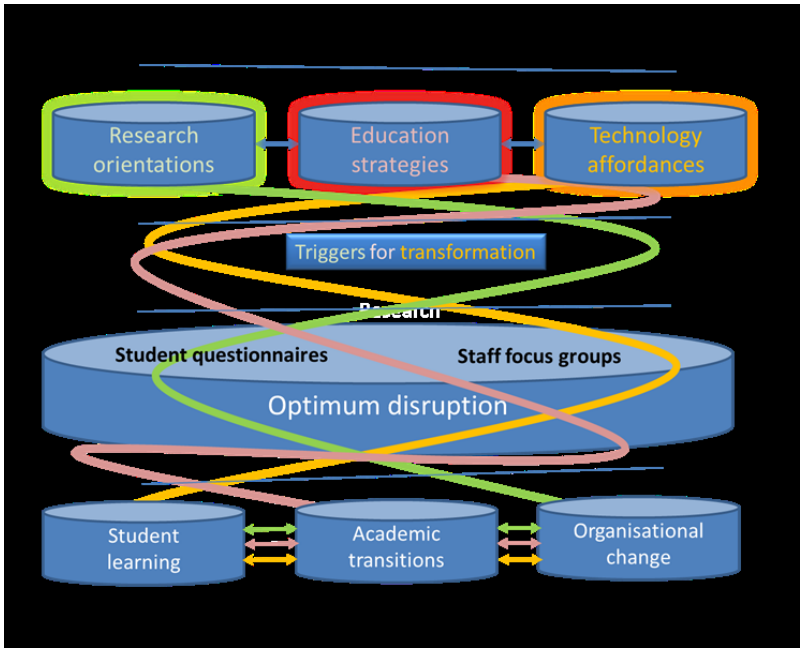

Figure 1: Triple helix model of change: research process and findings (Hutchings, Quinney & Galvin 2014)

3. Case Study: flipping the classroom and its implications

Exploring Evidence to Guide Practice (EE2GP) is an undergraduate intermediate (Level I, Year 2) unit/module designed for large student cohorts. Technology is used to connect learners to humanising practices through engagement with distinct kinds of evidence; conventional evidence, technical knowledge or knowledge for the 'head' in the form of qualitative and quantitative research papers and policy and practice guidelines and protocols, together with evidence of people's experiences of a situation or condition, knowledge for the 'heart', represented through stories, narratives, poetry and drama, and facilitated by rich, multimedia enabling technologies. What is unique about this blended learning approach is that it is informed and underpinned by a lifeworld-led humanising philosophy in which students are encouraged to gain personal insights that come from imagining 'what it is like' for the person experiencing human services, to make connections to their own personal and professional experiences, knowledge for the 'hand', and to integrate understandings about these different kinds of complex knowledge, the head, heart and hand to inform and guide their practice (Galvin & Todres 2013).

The student learning experience of a flipped classroom is facilitated over five weeks with eight learning days and two assessment days (See Figure 2). The learning days each week consist of one contact day and one day for student managed guided learning. The contact day includes lectures and group work designed to initiate student inquiry and collaborative learning based on student viewing, listening and reading of learning resources through online case studies designed for each of the different professional groups participating. Students, allocated to groups of 6-8, are guided through student managed guided learning (SMGL) activities, using a detailed guide with tasks and questions to structure and scaffold their learning, both for the group work in class and for self-managed SMGL activities on the student managed day out of class in preparation for critical reflection and individual blogs each week posted in the group blog.

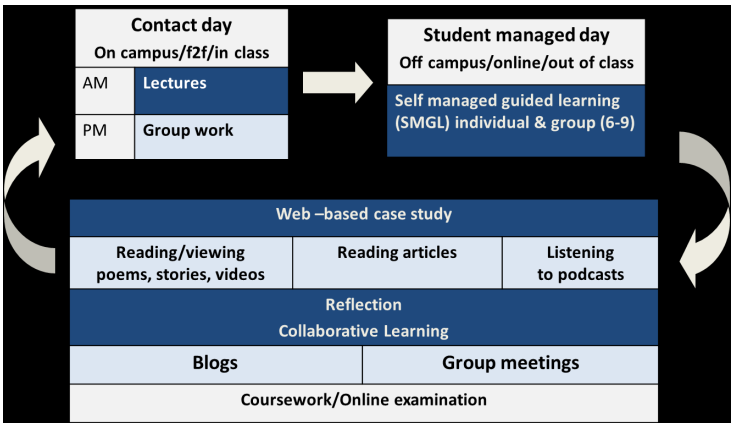

Figure 2: 'Flipped classroom' student experience (adapted from Hutchings et al 2013a)

Key drivers for this major development were informed by the University's and Faculty's strategic priorities to:

- Expose undergraduate students to research undertaken in the Faculty of Health and Social Sciences (HSS) and bringing research and teaching cultures closer together;
- Pioneer the application of innovative teaching, learning and assessment strategies
- Increase usage of technology enabled learning;
- Release staff potential; by achieving economies of scale through replacing face-to-face teaching across all the professional programmes with one common blended learning module.

The scale of transformational change effected by this initiative was considerable with anticipated and unanticipated outcomes. Key challenges associated with changing cultures, managing the scale of technology infrastructure, support required, and raised expectations for learning technology provision, were highlighted at individual, Faculty and organization levels. Since the curriculum was introduced in 2010, 11 professional groups have been involved with over 600 undergraduate students each year from nursing (adult, child health, learning disabilities and mental health), midwifery, occupational therapy, physiotherapy, operating

department practice, paramedic science, community development and social work. The initiative impacted directly on working practices, within HSS and the wider University. Key stakeholders included, academics, programme leaders, the Faculty management team, and professional staff in advisory and support roles, based in the Faculty and centrally, including a web developer/educational technologist, learning technologist, IT project manager, academic staff developer, quality and enhancement officer, and examinations coordinator. Approximately 40 academic staff have contributed to the module as developers, champions and facilitators. Introducing this module as a large change management initiative necessitated the negotiation of barriers and risks associated with resistance to change and some scepticism in our Faculty, not dissimilar to the 'resentment and ambiguity' identified by Browne (2005, p.57).

4. Methodology

'Our story' of negotiating change is told through the voices of those experiencing it, to enable us to explore strategies for effective change management through three major levers for change (the 'triple helix', of research, education and technology) towards transformations recognised in impacts on student learning, academic roles and organisational development. The methodological approach adopted was to build a multi-authored narrative for our story of negotiating change (See Figure 1). This approach is informed by the concept of 'organizational becoming' (Thomas et al 2011, p.22), where organizations are recognised 'not as fixed entities, but as unfolding enactments' in flux and 'constituted by and shaped from micro-interactions among actors, situated in their every-day work'. Our own position is that levers for optimum disruption towards achieving transformative learning can be recognised in action at individual and organizational levels through student and staff descriptions of their experiences. We draw on qualitative data collected in 2010-11 and 2011-12, captured through questionnaires and focus groups, to highlight individual and organisational benefits and barriers in deploying the triple helix (See Table 1).

Table 1: Demographic profile of participants (Hutchings, Quinney & Galvin 2014)

Data collection method	**2011.1 Block 1**	**2011.2 Block 2**	**2012.1 Block 1**	**2012.2 Block 2**
Students	n = 306	n = 260	n =219	n = 302
Online evaluation questionnaire 15 item statements 5-point Likert scale (Strongly agree to strongly disagree)	n = 301	n = 243	n = 188	n = 283
5 Open response questions				
• What enhanced learning	Student 2	Student 1, 9, 10		
• What challenged learning		Student 8, 13, 18, 20	Student 4, 6	
• What you enjoyed most	Student 3, 7, 14			
• What you enjoyed least	Student 12, 15, 17	Student 5, 19	Student 11	Student 16
Response rate	98%	94%	86%	94%
Staff				
Focus group (SFG) • Horizon scanning tool	n = 12			

The student experience was monitored and evaluated through weekly deployment of questions using the ARS (audience response system) voting pads or clickers and an end of module online evaluation completed following their online exam. A staff focus group (n=12) was conducted with academic champions and developers interested in contributing to the module, using an horizon scanning tool to stimulate discussions. Further staff comments were captured during a launch event and through ongoing feedback from programme teams. The core project team also shared their experiences of developing the module, considering what it meant for them, and how they engaged with the ups and downs of the process. The analysis of this data informs this paper. Ethical processes were followed to ensure informed consent and data confidentiality in compliance with institutional protocols for undertaking educational research with students and staff.

5. Analysis of findings

The intersections between research, education strategies and technology with their capacity for initiating 'optimum disruption', when flipping a classroom, are examined in relation to achieving student-centred learning, academic role transitions, and organisational change. These complex interrelationships forced us to consider issues of interdependency, tensions and, at times, conflicting agendas in respect of changing cultures, organizational priorities and our core team goals.

5.1 Research orientations for practice

A key driver for the initiative was to expose undergraduate students to research undertaken in the Faculty, drawing on research expertise informed by a lifeworld-led humanising philosophy (Galvin & Todres 2013). The 17 web-based case studies developed, provided diverse evidence of people's experiences of specific conditions and situations, such as stroke, dementia, back pain, birth, and social isolation. Students were facilitated to explore a range of rich, multimedia evidence from the arts and humanities including narratives and poems, informed by citizen and service user perspectives, in association with qualitative and quantitative research papers, and policy documents, to guide practice for humanly sensitive care (Pulman et al 2012).

5.1.1 Student experiences

Students appreciated the relevance of different kinds of research evidence to guide their practice and the value of engaging with service user and carers' stories:

> *Watching the clips relating to my case study, discovering what people went through and it having an impact on my way of thinking and how I can use this within my practice.* (Student 1)
>
> *The qualitative evidence stood out for me as I began to empathise with the patients. I was able to understand their thoughts and feelings, and began thinking of how this can be applied to practice.* (Student 2)

Students demonstrated developing awareness and confidence to assess different kinds of research evidence and apply critical judgement in professional practice:

> *It made me realise that not all evidence is reliable and encouraged me to make my own decision about what evidence to take into account and how to apply it into practice.* (Student 3)

However some students experienced difficulties understanding research methodologies and terminology and seeing the application to professional practice. They described varying degrees of disruption from feeling challenged to experiencing the tipping point beyond optimum disruption:

> *Getting to understand all of the research terms that I had never heard of before and relating these to practice challenged my learning and has given me a deeper interest into the subject of using evidence to guide practice.* (Student 4)
>
> *The amount of reading you were expected to do, and learning all the research processes was incredibly difficult as this topic was totally alien to me.* (Student 5)

5.1.2 Staff experiences

This initiative offered opportunities to develop greater integration between research interests and teaching in the Faculty. Academic staff feedback welcomed the integration of lifeworld-led theoretical perspectives for guiding practice:

> *I just really loved the idea that the evidence comes from the arts and humanities as well as the sort of traditional research evidence.* (SFG)

Academic staff also appreciated how the module demonstrated success in bringing the research and teaching cultures closer together:

> *Students have often said to me they think that research is done by those people who are very academic and very senior, so I think it's really good that those people are actually teaching at an undergraduate level and making it applicable to practice in a really exciting way.* (SFG)

However staff also realised the disruptive nature of this approach for their own roles.

> *The model of the unit challenges the traditional way in which we have viewed how we carve out our time as academics and teachers. I'd quite like to develop a case study so how does that fit with my role in the rest of the world of my work, it's not a case of contact hours, but it's about what role do I play?* (SFG)

5.2 Education strategies for transformative learning

Another driver was to pioneer the application of innovative teaching, learning and assessment strategies to alter the typical mix of face-to-face lectures and seminars linked to essays or group presentations and encourage more active co-construction of knowledge over information transmission (Hutchings 2008) by flipping the classroom. Students were allocated an online case study on a particular condition or situation relevant to their professional practice, research process and methods information, podcasts, keynote lectures, and individual and group work activities shared through group blogs. The development of new assessment strategies, including assessment of group blogs, with formative assessment of weekly individual blog contributions culminating in a final group blog assessment and delivery of a multiple choice computer assisted assessment, with weekly practice questions in class, using the ARS voting pads, to prepare students for the online examination, has been discussed elsewhere (Hutchings et al 2013a).

5.2.1 Student experiences

Students had to read, prepare weekly blogs and work in groups to produce their group coursework summary. They recognised the student centred learning approach as different and some enjoyed the active and collaborative learning opportunities:

> *It is the first time that we have really had to manage our own learning rather being 'fed' the*
>
> *information in a lecture.* (Student 6)
>
> *I enjoyed working in my group to produce the final blog. We worked well together and were able to bounce ideas off each other.* (Student 7)

The degree of scaffolding necessary to support student learning varied with different students. The challenges were viewed positively by some and they were able to learn progressively using the online resources and guidance:

> *Having to read, understand and submit a blog weekly challenged me and was good for me to take in what I had learned and read and think about it.* (Student 8)
>
> *The case studies and podcasts have been a new way of learning for me and it has encouraged me to do work on a weekly basis. This is something I usually struggle to do, but knowing that a weekly piece of work needs to be submitted has aided my learning.* (Student 9)
>
> *Each week it became easier to understand what was required of us to do. It all came together like a jigsaw bit by bit. I felt at the end I had learnt a lot more than I had thought.* (Student 10)

Other students were more reliant on face-to-face contact with a tutor and peers:

> *I would have preferred normal group seminars where we are being taught information and we can freely ask questions.* (Student 11)

The normal pattern of engagement in lectures and seminars appeared to be disrupted by this more independent student managed learning approach, which relied on student engagement and learning with the online materials and guidance provided. The tipping point in optimum disruption, the transition to a more independent learning approach, proved too much for some students.

> *Not being told the information that was necessary to pass the unit, having lecturers believe that "it's on MyBU" or "listen to the podcast" is a suitable response or solution to a student's enquiry.* (Student 12)

5.2.2 Staff experiences

Implications for academic staff were also manifested through the introduction of these different education strategies. Staff who assisted in the development of the web-based case studies vocalised how it can change how they interact with students. One described how she felt distanced from the body of knowledge she had created and concerned the facilitators would do justice to her work:

> *I feel slightly detached now which has been quite difficult. It's like giving birth...! Well there you go and look after it and make sure that you get across what I want you to get across.* (SFG)

5.3 Technology affordances and logistical impacts

The University and Faculty's strategic priorities included increasing usage of technology mediated learning to enable the student learning experience to be enhanced and provide opportunities for academic staff to engage more fully in learning technology enhancement through championing, developing and facilitating curricular initiatives. It was anticipated the introduction of the module would bring economies of scale in staff facilitation realized through the changing balance between face-to-face teaching and online learning in this model of the flipped classroom. The large cohorts of students each year were facilitated in two blocks of 300 students using a blend of enabling technologies to provide rich, multimedia online case study resources, group blogs, online frequently asked questions, and a fast feedback forum, all focused on enabling collaborative learning activities, in class and out of class, supplemented by in class lectures supported by ARS voting pads used to gather opinions and gauge knowledge, and student drop-in sessions. Resourcing requirements also included use of a 300 capacity lecture theatre complex including flexible learning spaces that could accommodate group work for student contact days necessitating timetabling the in class contact days at a different campus, booking of computer labs for the computer based assessment, technical support for facilitation of the ARS voting pads, and provision of a robust and secure online assessment platform for delivery of the online exam.

5.3.1 Student experiences

Students recognised the technology mediated approaches adopted as distinct from previous learning experiences and they welcomed the flexibility they afforded:

> *It was so different from any other module we had done before and was highly computer based.* (Student 13)

> *I enjoyed the self-managed learning days as I was able to complete the required work in my own time and at my own pace.* (Student 14)

While some students struggled initially they managed the optimum disruption initiated by these approaches and their readiness for engaging with them improved:

> *I found blogging very difficult as I'm not very brilliant on the computer but that in itself was a learning process!* (Student 15)

> *I think if I was asked to do blogs now I would feel more comfortable with them.* (Student 16)

5.3.2 Staff experiences

The introduction of technology mediated learning within the module affected the roles of academics as developers, champions, and facilitators. It demonstrated role transitions, from module teachers and research staff to resource developers, from uni-professional programme leads to transprofessional champions, and from research-focused professoriate to module facilitators. Academic staff identified how the technology could impact on their working practices and changing roles:

> *It does radically change how I interact with the students …… the technology is starting to take us into new areas and there is an element of being de-skilled and wondering how I am going to cope in this brave new world.* (SFG)

6. Discussion: responding to 'the bomb in the basement'

We have shared our story and outcomes of working with the complexities of change at individual, professional and organisational levels and identified the connectivity and flux between these levers in securing effective change management. While individual narratives may have focused on the nature of the technology or the education strategies adopted, or the ways the module engaged with research, these findings demonstrate the complexity and intersections of factors at work in successfully managing a major curriculum innovation and the adoption of a flipped classroom approach. They highlight the importance of deploying strategies for change management that can negotiate through the 'wicked' problems (Rittel & Webber 1973), not only logistical but also significantly cultural, and seemingly intractable, which underpin this initiative.

An academic colleague from another faculty, who attended one of the launch events, described the potential impacts of this innovation as '*a bomb going off in the basement'*. Our analysis has revealed factors identified are as much cultural as logistical. For example, one student says:

> *I would have preferred more lectures and less 'computerised' study as I don't feel this aided my learning at all.* (Student 17)

How are we to interpret this comment? Is this about the use of technology mediated approaches per se or could it be more deeply embedded in the degree of disruption caused by the move away from the normality of educational strategies established in the first year of the programmes and focused on the familiar structure of lecture and seminars? Could the innovation, facilitated through technology enabled learning, have strayed too far from the established culture and personalisation enabled in small face-to-face groups within uni-professional programmes?

> *I feel this unit has used far too much ICT. I agree it is important in our future disciplines, however, this unit has been completely impersonal.* (Student 18)

> *Studying in such a large group. It lost the personal touch.* (Student 19)

On the one hand, organisational level logistical problems in managing complexity, dealing with risks, and achieving integration could be presented as resolvable with careful planning:

> *There's a lot of quite complex background issues to get resolved and sorted to be able to deliver something that's slick and successful because it requires pulling together an awful lot of different teams.* (SFG)

The core planning team acknowledged the need *'to have confidence the technology works'* with *'Plans and processes for systems failure and managing organisational pitfalls'.* (SFG)

But on the other hand, there was a lot of change impacting on stakeholders at individual and organisational levels. Some staff felt an '*element of being deskilled*' with:

> *So many different techniques and technologies for people who have maybe not engaged in it before.* (SFG)

Some students felt overwhelmed by the amount of disruption generated by this initiative:

> *Having it on a different campus, was all out of our comfort zone, different lecturers, different style of learning, different online style of accessing information.* (Student 20)

6.1 Strategies for effective change management

Enabling technologies offer unprecedented opportunities for flipping the classroom to achieve student-centred learning. While the concept of the flipped classroom provides a powerful catalyst for changing education practice, it can hide the immense amount of time and effort required to support and sustain student-centred learning for large cohorts of students. Strategies for ensuring reliability and sustainability of resources and tools, changing people and cultures, and embedding processes into education practice, are needed to assure ownership and transferability of the processes and sustainability of the initiative so that:'*It*

doesn't sit outside, it sits within'… (SFG) the programmes, framework teams, Faculty, and University. Strategies for success focus on:

6.1.1 Creating a shared vision through a holistic model for education innovation

The success of this initiative is based on a 'triple helix' model for education innovation with three major and interconnected strands, informing, grounding and aligning the processes of change management, previously discussed by Hutchings, Quinney & Galvin (2014) and represented in Figure 3.

- Strand 1: Research orientation for practice - *Embedding a lifeworld-led theoretical perspective as a model of transprofessional and transformative learning*
  The theory of lifeworld led care and education, bringing art and science together, is underpinned and informed by research expertise in the Faculty. Learners are connected to humanising evidence based on the head, heart and hand for guiding and developing professional practice for critical judgement and ethical sensitivity.

  Through flipping the classroom, we have demonstrated what Wallace et al (2014) described as a commitment to strategically designed learning opportunities which can guide our students towards deeper learning through engagement in immersive real life stories for nurturing knowledge for the heart as well as knowledge for the head. What informs this approach is the goal of preparing students for professional practice by developing their "capacity to think like an expert" (Wallace 2014, p 269).

  Strand 2: Education strategies for transformation - *Realising a social-constructivist pedagogy for informing student-centred collaborative learning*

  Student effort is rewarded through reading, imagining and integrating evidence, capitalising on the significance of others through innovative arts and humanities materials as well as traditional research evidence, peer group learning, and tutors. The key message is that research is embedded in practice and not a technical toolkit. Learning is assessed formatively by means of weekly individual blogs and summatively through group coursework blog summaries and an online multiple choice exam.

  The importance of realising a social-constructivist pedagogy, is reinforced by Mazur (2009) who challenged assumptions that as academics we know what education is, arguing how it is much more than just information transfer. For successful learning to take place, we need to use strategies for engaging students dynamically because students need to work with new information to make sense of it and to make connections to their pre-existing knowledge and experiences. Mazur (2009) explained how his teaching had evolved from "teaching by telling" to "teaching by questioning", using multiple choice questions for students to answer with clickers to promote thinking about challenging topics. Further recognition of the value of achieving 'optimum disruption' for successful learning is reflected in Strayer (2012 p.192) where he stated: "The disequilibrium or unsettledness that students face in an inverted classroom is not necessarily at cross purposes with successful learning" but he also recognises the need for scaffolding with "support structures built into the course so that the teacher and students alike can monitor student learning as they complete tasks".

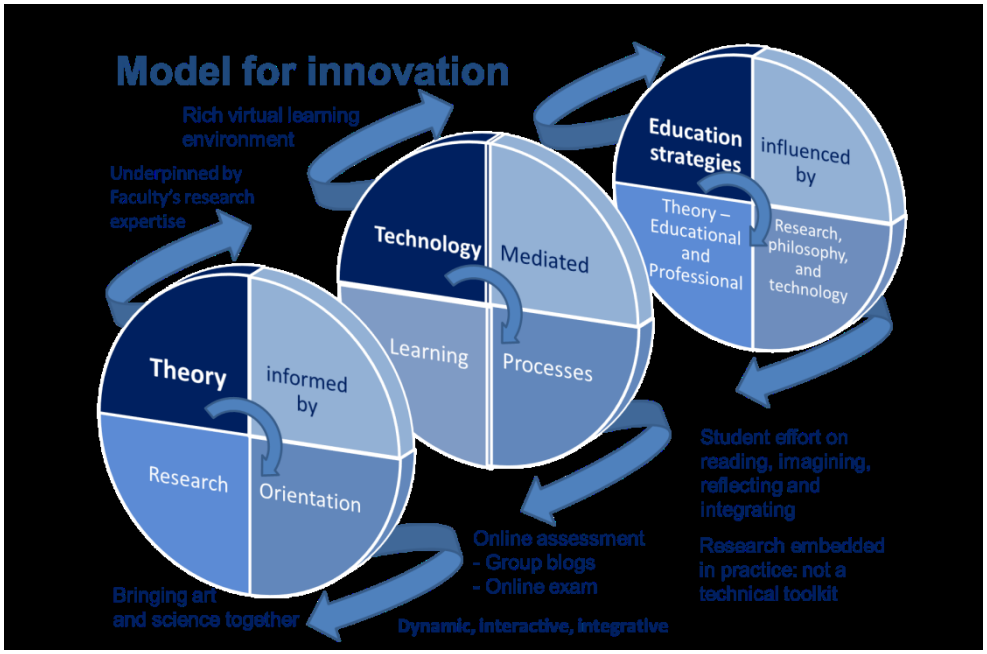

Figure 3: Triple helix model for education innovation

- Strand 3: Technology affordances - *Harnessing the potential of a range of technologies to enhance student learning*
  The learning processes are mediated by a virtual learning environment with rich multimedia web-based case studies and collaborative group work facilitated through blogs, online assessment and ARS. The technologies can also deliver cost-effective solutions for managing large student numbers and releasing staff time.

  Strayer (2012 p.172) highlighted how "interactive technologies make it possible for educators to qualitatively reconceptualise the teaching and learning dynamic" but he also acknowledges how students "could be frustrated when they encounter learning tasks that aren't clearly defined" (2012 p. 191). For success, the potential distancing experienced through technology affordances needs to be carefully balanced by social presence, focused on discourses among students and their teachers, and teaching presence, through appropriate orchestration of the learning environment (Kim et al 2014).

This triple helix model for education innovation is dynamic, interactive, and integrative. It has enabled us to forge ahead with managing the complexities and uncertainties wrought by change, working with systemic challenges beyond our control but not beyond the powers of a cohesive and committed team to negotiate and influence.

6.1.2 Building a robust and dedicated core team for managing change

We have described our approach to change management as 'middle-grounded' to signify the benefits of actively promoting and building on open, flexible, morphing teams, grounded in a humanising philosophy and a shared vision and values for developing innovative pedagogical practices endorsed by our Faculty (Hutchings et al 2011). The shared vision, commitment and complementary team roles helped manage the integration and risks associated with changing cultures, and negotiating institutional processes, technology infrastructure, and raised expectations. Team members drew on the experience, enthusiasm and commitment of colleagues to deal effectively with challenges, constraints and uncertainties associated with the development of this complex project.

6.1.3 Managing organisational challenges through partnership, listening and regular communication

Harnessing technology for enhancing student learning highlighted organisational and individual challenges in managing the changes associated with the scale of technology infrastructure, support required, and emergent expectations for learning technology provision for all. Organisational challenges included managing timetabling

logistics, organising rooms for group work and computer labs for online exams, and overcoming systems failures. Baepler et al. (2014, p.227) have clearly identified how the design and availability of conducive learning spaces really does matter, identifying how "the environment of a large lecture hall with fixed seating in rows makes peer collaboration difficult and awkward" and their results showed that "flipped, hybrid active learning classroom-based classes can yield student-learning outcomes that are at least as good as, and in one study better than, a comparable class taught in a traditional auditorium-style classroom." Smith (2012) emphasises the considerations underpinning the diffusion of innovative learning and teaching practices, requiring senior management support, recognition of the resources, time and effort needed to change existing practices, supportive networks and institutional infrastructure. Working in close collaboration with committed and responsive Estates and IT champions helped manage organizational resistance.

Pennington (2003, p.5) recognised that: "Organisational politics are heightened and amplified during a change process as individuals and groups perceive shifts in power, authority, influence and territory. For this reason successful change requires not just technical competence from 'managers', but also sensitivity to political and human dimensions of organisational life." The core team experienced cultural resistance communicated in staff scepticism and uncertainty expressed by professional programme colleagues. Flipping the classroom leads to shifts in academic roles from sage on the stage to guide on the side and in that role transition we need to recognise becoming what Wallace et al (2014, p 269) identify as cognitive coaches, enabling students to "learn to be" rather than to "learn about". These challenges have highlighted the importance of promoting ownership and transferability through developing creative and collaborative partnerships working in flexible and supportive multi-disciplinary/professional teams where roles merge and coalesce. The team's efforts to consider the pedagogic and structural challenges (Browne 2005) in an integrated way were evident in the collaborative team approach, with role transitions experienced by staff being not dissimilar to those identified by Anderson (2009). While it was important to recognize the behaviours, motives and beliefs of staff who may resist change (Outram 2004), the commitment to fostering an effective collaborative team, both within and across discipline areas, assisted in the process of achieving the strategic goals of the university and realizing the vision of the team designing and delivering this module. This approach was intended to avoid what Ward et al (2010 p.40) describe as situations where 'IT-driven decisions and project management principles overrode the pedagogical considerations and autonomy of academic decisions making processes'. Mazur (2009, p.51) emphasized that "it is not the technology but the pedagogy that matters".

6.1.4 Capitalising on networking opportunities and forming alliances for horizon scanning

Opportunities to network with and learn from colleagues with expertise in different disciplines and other HEIs facilitated through the UK HEA Enhancement Academy (Hutchings et al 2011) provided a powerful and influential resource to inform and support the project. Links established with the University of Oxford Medical Sciences Division proved invaluable for informing the computer assisted assessment. The contribution of a Leadership Foundation for Higher Education (LFHE) 'critical friend' was pivotal in providing focused advice and support and instrumental in 'winning hearts and minds'. The generosity of these colleagues sharing their expertise was highly valued and brought added caché and gravitas to the initiative.

7. Conclusions

We successfully introduced a generic structure and processes through the design and development of this module. As a result, we hope the path for future developments will be made easier for other enthusiasts to follow. In placing pedagogy, informed by a lifeworld-led philosophy and supported by a range of technologies, at the centre of the rationale for change this collaborative and creative project challenged and moulded existing organisational and individual practices (Browne 2005). Our views resonate with those of Greener (2010) that a more detailed understanding is needed of beliefs and behaviours of students and staff and environments in which these operate when introducing and adopting technology enabled learning practices. This incorporates consideration of personal and institutional pedagogies, digital skills and self-efficacy in technology usage. Achieving 'optimum disruption' (Hutchings, Quinney & Scammell 2010a), whether in a flipped classroom or more traditional classroom requires institutions and individuals to accept the normality of what Ashcraft and Trethewey (2004 p81) refer to as the 'dualities, contradictions and paradoxes' embedded in day to day practices. This can lead to practices that foster the innovation, creativity and change (Barge et al 2008) at the heart of our 'triple helix' model of change. There are no guarantees of success. While students appear to prefer a flipped classroom approach (Baepler et al 2014; Moffett and Mill 2014), some can find it

disconcerting at first and "some remain dissatisfied with the change in the traditional approach despite the learning gains" (Baepler et al 2014, p.229) and, while this may not always translate into improved performance in assessment (Moffett and Mill 2014), it may promote lifelong learning. However it is vitally important for HEIs to respond to the 'bomb going off in the basement' and we would like to conclude by identifying that the structure of the institution has shuddered and some bricks have come loose. These have been repositioned and further building work is in progress.

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References

Argyris, C. and Schön, D. (1978) *Organizational learning: a theory of action perspective.* Reading, Massachusetts: Addison-Wesley.

Anderson JK. (2009) The work-role transition of expert clinician to novice academic educator. *Journal of Nursing Education*, 48(4) pp 203-208.

Ashcraft KL and Trethewey A. (2004) Developing tension: an agenda for applied research on the organisation of irrationality. *Journal of Applied Communication Research*, 32, pp 302-332.

Baepler, P., Walker, J.D. and Driessen, M. (2014) It's not about seat time: blending, flipping, and efficiency in active learning classrooms. *Computers & Education* 78 pp 227-236.

Barge J K, Le M, Maddux K, Noabring R and Townsend B. (2008) Managing dualities in planned change initiatives. *Journal of Applied Communication Research,* 36 (4) pp 364-390.

Breen R. Lindsay R, Jenkins A and Smith P. (2001) The role of information and communication technologies in a university learning environment. *Studies in Higher Education,* 26 (1) pp 95-114.

Browne E. (2005) Structural and pedagogic change in further and higher education: a case study approach. *Journal of Further and Higher Education,* 29 (1) pp 49-60.

Dewey, J. (1933) *How we think.* Boston: D.C.Heath.

Dewey, J. (1938) *Experience and education.* New York: Simon & Schuster.

Dolence, M.D. and Norris, D.M. (1995) *Transforming higher education: a vision for learning in the 21st century.* Ann Arbor, Michigan: Society for College and University Planning.

Galvin, K. and Todres, T. (2013) *Caring and well-being: a lifeworld approach*. Abingdon: Routledge.

Greener S. (2009) Talking online: reflecting on online communication tools. *Campus-Wide Information Systems,* 26 (93) pp178-190.

Greener, S. (2010a) Staff who say no to Technology Enhanced Learning. *In*: Ismail I (ed). *Proceedings of the 5th International Conference on E-Learning*, Penang, Malaysia. pp 134-139.

Greener S. (2010b) Plasticity: the online learning environment's potential to support varied learning styles and approaches. *Campus-Wide Information Systems.* 27 (4) pp 254-262.

Hutchings, M. (2008) Quick-fix learning: challenging the concept of learning for learning's sake. In Rust, C. (ed.) *Improving Student Learning: For What?* Oxford Centre for Staff Development. pp 143-57.

Hutchings, M., Quinney, A. and Scammell, J. (2010a) The Utility of Disruptive Technologies in Interprofessional Education: Negotiating the Substance and Spaces of Blended Learning, *In* Bromage, A. et al. (Eds) *Interprofessional eLearning and Collaborative Work: Practices and Technologies.* Hershey, PA: IGI. pp 190-203.

Hutchings, M., Galvin, K., Todres, L., Quinney, A., Pulman, A., Atkins, P. and Gentle, P. (2010b) *Transformational Change through Lifeworld-led Multimedia VLE engagement*, Embedding Work-with-IT Final Report. Bournemouth University and the Leadership Foundation for Higher Education for JISC/SEDA.

Hutchings, M., Galvin, K., Pulman, A., Todres, L., Quinney, A., Clark, V. and Atkins, P. (2011) *Framing Lifeworld-led Evidence to Shape Practice: Facilitating a Collaborative Transprofessional Curriculum for Health and Social Work Disciplines*. Final Report for Higher Education Academy Discipline-focused Learning Technology Enhancement Academy. Bournemouth University.

Hutchings, M., Quinney, A., Galvin, K. and Clark, V. (2013a) The yin/yang of innovative technology enhanced assessment for promoting student learning. In Greener, S. (ed.) *Case studies in e-learning research for researchers, teachers, and students.* Reading: Academic Publishing International. pp 62-79.

Hutchings, M., Scammell, J. and Quinney, A. (2013b) Praxis and reflexivity for interprofessional education: towards an inclusive theoretical framework for learning. *Journal of Interprofessional Care* 27 (5) pp 358-366.

Hutchings, M., Quinney, A. and Galvin, K. (2014) Negotiating the triple helix: harnessing technology for transformation. In: Yáñez, T., Rodriguez, O. and Griffith, P. (eds.) *Proceedings of the 9th International Conference on e-Learning*, Technical University Federico Santa María, Valparaiso, Chile, 26-27 June 2014. pp 76-85.

International Telecommunication Union (2013) *Measuring the information society*. Geneva, Switzerland: International Telecommunication Union.

Kim, M.K., Kim, S.M., Khera, O. and Getman, J. (2014) The experience of three flipped classrooms in an urban university: an exploration of design principles. *Internet and Higher Education*, 22 pp 37-50.

Lave, J. and Wenger, E. (1991) *Situated learning: legitimate peripheral participation.* Cambridge: Cambridge University Press.

Lea M R and Jones S. (2011) Digital literacies in higher education: exploring textual and technological practice. *Studies in Higher Education,* 36 (94) pp 377-393.

Mayes, T. and de Freitas, S. (2007). Learning and e-learning: the role of theory. In H. Beetham. & R. Sharpe (Eds.). *Rethinking pedagogy for a digital age.* London: Routledge. pp.13-25.

Mazur, E. (2009). Farewell, lecture? *Science* 323 (5910) pp 50-51.

Moffett, J. and Mill, A.C. (2014) Evaluation of the flipped classroom approach in a veterinary professional skills course. *Advances in Medical Education and Practice*, 5 pp 415-425.

Mukerjee, S. (2014) Agility: a crucial capability for universities in times of disruptive change and innovation. *Australian Universities Review*, 56 (1) pp 56-60.

Norris, D., Brodnick, R., Lefrere, P., Gilmour, J. and Baer, L. (2012) Transforming in an age of disruptive change: *Planning for Higher Education* 41 (2) Part 1: Back to the future, zooming to the present pp 18-32 and Part 2: Getting started, getting it done. pp 33-55.

Outram S. (2004) 53 interesting ways in which colleagues resist change. *Educational Developments*, 5 (2) pp 1-4.

Pennington, G. (2003) *Guidelines for promoting & facilitating change.* Higher Education Academy: Learning and Teaching Support Network Generic Centre.

Picciano, A.G; Dziuban, C and Graham, C.R. (2014) *Blended learning: research perspectives*. Vol 2. Routledge.

Pulman, A.J., Galvin, K., Hutchings, M., Todres, L., Quinney, A., Ellis-Hill, C. and Atkins, P. (2012) Empathy and Dignity through Technology: using Lifeworld-led Multimedia to Enhance Learning about the Head, Heart and Hand. *Electronic Journal of E-Learning*, 10 (3) pp.320-330.

Rittel, H.W.J. and Webber, M.M. (1973) Dilemmas in a general theory of planning. *Policy Sciences* 4 pp 155-169.

Shore, C. (2010) Beyond the multiversity: neoliberalism and the rise of the schizophrenic university: Special issue on anthropologies of university reform. *Social Anthropology* 18 (1) 15-29.

Smith K. (2012) Lessons learnt from literature on the diffusion of innovative learning and teaching practices in higher education. *Innovations in Education and Teaching International*, 49 (2) pp 173-182.

Strayer, J.F. (2012) How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research*, 15 (2) pp 171-193.

Thomas, R. Sargent, L.D. and Hardy, C. (2011). Managing organizational change: negotiating meaning and power-resistance relations. *Organization Science* 22 (1) pp.22-41.

Ward M-H, West S, Peat M and Atkinson S. (2010) Making it real: project managing strategic e-learning development processes in a large, campus-based university. *Journal of Distance Education,* 24 (1) pp 21-42.

Wallace, M.L., Walker, J.D., Braseby, A.M. and Sweet, M.S. (2014) Now, what happens during class? Using team-based learning to optimize the role of expertise within the flipped classroom. *Journal on Excellence in College Teaching*, 25 (3&4) pp 253-273.

Westermann, E.B. (2014) A half-flippede classroom or an alternative approach?: primary sources and blended learning. *Educational Research Quarterly*, 38 (2) pp 43-57.