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Navigating E-Learning and Blended Learning for Pre-service Teachers: Redesigning for Engagement, Access and Efficiency

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Abstract: Nebulous combinations of face-to-face and online learning are increasingly common across Australian higher education contexts. This paper reports on part of a redesign project of an undergraduate education subject at a regional university. The aim of the redesign was to enhance e-learning and blended learning environments. An approach that maps the evaluation research activities to the design and development cycle of e-learning tools and learning tasks was adopted (Phillips et al., 2012). The research took a participatory format involving ongoing reflective exchange with pre-service teachers with the aim of transforming practice. The article presents the context of e-learning, blended learning and drivers of curriculum renewal in teacher education at a regional institution and discusses the phases of the redesign project which adopted an action research approach. Finally the paper discusses the implications of the redesign for informing future practice and in approaching e-learning and blended learning curriculum design.

Background

The subject ED2990: Education for Cultural Diversity is a core subject in the pre-service teacher education program at James Cook University in North Queensland. The subject is offered to second year pre-service teachers at both the Cairns and Townsville campuses. The subject aims to prepare pre-service teachers with the knowledge of theories, policies, frameworks and teaching strategies to cater for culturally diverse classrooms and involves pre-service teachers confronting their understandings of their own culture and the culture of 'others'. The subject is vital to the strategic aims of the university in catering for underserved populations in our region and is a necessity for pre-service teachers who are entering increasingly economically and culturally diverse schools in Australia.

The aim of the redesign was to enhance teaching and e-learning approaches for flexible and inclusive learning, extend access and address efficiency of delivering the subject. The redesign project was funded by the National Center for Academic Transformation, the LH Martin Institute and James Cook University. The contemporary teaching and learning approaches were informed by The National Center for Academic Transformation (NCAT) Models for Online Learning (2003)¹. An evaluation of the impact of the redesign on the learning outcomes was achieved by comparing pre-service teachers' performance and achievement in the traditional format in 2011 and redesigned subject formats in 2012 and 2013. Phillips, Kennedy and McNaught (2012) suggest the use of the term 'evaluation

¹ NCAT is based in the USA and has developed its redesign methodology and a number of resources from more than 120 large-scale course redesigns. http://www.theNCAT.org/R2R/R2R_Planning_Resources.htm

research' to capture the idea that investigations of e-learning will often involve a mix of evaluation and research activities that can be applied throughout the e-learning lifecycle.

The redesign project sought to develop pre-service teachers' experiences of emerging technology-based curriculum innovation designed to enhance engagement and learning. Cobcroft, Towers, Smith and Bruns (2006) observe that the dramatic shift in the characteristics of contemporary learners should shape the curriculum and institutional strategies and policies, and argue for blended learning environments that incorporate the physical and virtual as critical strategies for higher education institutions. The redesign attempted to engage pre-service teachers in developing their capacity to use emerging technologies to develop teaching approaches that support interactive, engaging and collaborative learning. McGovern and Gray (2005) observe that these learning spaces have implications for learning experiences, teacher practices, technology planning and sustainability. It is reasonable to expect that the pre-service teachers will incorporate the experiences these learning spaces afford in pre-service teacher education and into future practice.

Learning Opportunities Afforded by Emerging Technologies

When it comes to learning technology, there is an ebb and flow between making judgments about the e-learning environment and developing a greater understanding of learning in that environment (Phillips et al., 2012). The NMC Horizon Report (2013) suggests learners already spend much of their 'free' time on the Internet, surfing, learning and exchanging new information often via their social networks. The report further suggests that those institutions that embrace face-to-face/online blended or hybrid learning models have the potential to leverage the online skills learners have already developed independent of academia. Although with our cohort we know that we cannot make general assumptions about the learners' digital preparedness. However, the online learning environments and emerging technologies can offer our students different affordances than physical campuses, including opportunities for increased collaboration while equipping them with stronger digital skills (NMC Horizon Report, 2013).

Graham, Woodfield and Harrison (2013) argue the adoption of blended learning, a combination of traditional face-to-face and technology-mediated instruction, is increasing in higher education around the world, with some scholars predicting that blended learning will become the 'new traditional' model. However, blended learning means different things to different people. Picciano (2009) suggests that there are many forms of blended learning but a generally accepted definition is contestable. One school's blended is another school's hybrid, or another school's mixed-mode. Furthermore, the issue is not just one of labels but also of the lack of agreement on a broad versus a narrow definition. Without a clear definition, blended learning can be perceived as some nebulous combination of online and face-to-face instruction. And within these nebulous spaces the role of the learner and teacher is not as clearly established as traditional forms of instruction that students might be used to.

Online or other modern learning environments are trying to leverage both formal and informal learning experiences. Mobile and wireless technologies offer considerable benefits and affordances sympathetic to building and supporting creative, collaborative, critical, and communicative capacities within learning environments (Cobcroft, et al., 2006). They enhance learners with more open-ended, unstructured time where they are encouraged to experiment, play, and explore topics based on their own motivations (NMC Horizon Report, 2013). This type of learning will become increasingly important in learning environments of all kinds. MCEETYA (2005) suggests that students increasingly live and thrive in the digital

environment, comfortable with virtual, screen-to-screen and face-to-face interactions. These students engage and work with multi-layered packages of non-linear information comprising images, sound, video, text and graphics.

Cox (2012) argues that although increasing numbers of young people have access to a wide range of emerging technologies during their leisure activities, little is known about this impact on their learning. Much of the research evidence, to date, of students' informal uses of emerging technologies is about the frequency of use in different educational settings and the different types of uses occurring among learners at school and in the home. There is little evidence of the interrelationship between them. Muresan and Gogu (2013) highlight students' lack of adequate digital competences required for participating in e-learning in their study. They point to the fact that it is not only lack of digital competences, but other skills like self-motivation, self-driven learning capacity, good communication, including communication in foreign languages and cultural awareness that can affect optimal online learning.

Many research approaches need to change to take account of new forms of knowledge representation and the variation in students' digital literacy skills (Cox, 2012). Nagarajan and Wiselin Jiji (2010) suggest that virtual/e-learning represents an innovative shift in the field of learning, providing rapid access to specific knowledge and information. It offers online instruction that can be delivered anytime and anywhere through a wide range of electronic learning solutions. This technology enhanced learning has the goal to provide socio-technical innovations (also improving efficiency and cost effectiveness) for e-learning practices, regarding individuals and organisations, independent of time, place and pace (Graham et al., 2013). Thus blended learning models, when designed and implemented successfully, enable students to travel to campus for some activities, while using the network for others, taking advantage of the best of both environments (NMC Horizon Report, 2013).

Mobile learning (M-learning) is a form of virtual/e-learning. M-learning is any sort of learning that happens when the learner is not at a fixed predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies. The NMC Horizon Report (2013) highlights many universities are designing software for mobile and wireless technologies along with best practice guidelines for educators and students. These technologies include handheld computers, MP3 players, notebooks, mobile phones and tablets. The NMC Horizon Report suggests tablet computing has carved its own niche in education as a portable and always-connected family of devices that can be used in almost any setting. Equipped with WiFi and cellular network connectivity, high-resolution screens, and with a wealth of mobile apps available, tablets are proving to be powerful tools for learning inside and outside of the classroom. Thus M-learning focuses on access and mobility of the learner, interacting with portable technologies, learning that reflects a focus on how society and its institutions can accommodate and support an increasingly mobile learner. In our regional university travel, family and employment commitments dictate that students are very mobile; in fact over 69% of students are using mobile versions of the learning management system Blackboard.

Methodology

Phillips et al. (2012) argue that research into learning technology as a designed phenomenon has an extra element not present when researching natural phenomena. The research needs to consider the way in which a 'manufactured' artefact functions, and whether it functions as designed. Phillips et al. take a broad view of the interpretation of artefact to mean both tools developed using information and communication technologies (ICTs) and learning tasks designed through these tools. With natural phenomena, researchers have to

take them as they are; but with designed phenomena, there is potential to improve the phenomenon through its design. Thus, research into designed phenomena is not only concerned with the behaviour of that phenomenon, but also with the design and functionality of the artefact which represents the phenomenon. Cox (2012) observes that what makes researching e-learning so difficult is the ever-changing technology itself and the increasing access to emerging technologies in informal settings, changing the balance between formal and informal uses of e-learning.

The redesign project aimed to incorporate technology enhanced teaching and learning approaches for flexible and inclusive learning environments and address the question: What are pre-service teachers' experiences of a more flexible technology enhanced/blended learning redesign approach? The redesign project took a participatory format involving ongoing reflective exchange with pre-service teachers with the aim of transforming practice and was informed by the NCAT Replacement model and components of the Fully Online model. McNiff and Whitehead (2006) suggest that participatory research "is a form of research that enables practitioners to learn how they can improve practice, individually and collectively" (p. 256) and Kemmis and McTaggart (2005) perceive practice as reflexive to be studied dialectically through critically examined action of participants.

Four teacher educators engaged in a reflective dialogue and conducted pre and post surveys with pre-service teachers who consented to participate. We drew from Kemmis and McTaggart (2005) to analyse the responses from the pre-service teachers and to critically reflect on our own practices. The redesign project evolved through three phases: Planning stage (Subject redesign and development), Pilot stage (Implementing the plan) and Full Implementation stage. Each stage of the project was informed by pre-service teachers and teaching staff feedback and reflection. In the Pilot stage sixty pre-service teachers consented to participate, and in the Full Implementation stage sixty six pre-service teachers consented to participate. At each stage, the student participants represented approximately 25% of the overall cohort. The project sort and received ethics approval from the institution with key considerations being the anonymity provided in the online surveys and formal subject feedback mechanisms. The next sections describe in detail the ongoing reflective exchange in the three phases of the project.

Planning Stage: Subject Redesign and Development

We are a regional university with both on campus face-to-face study programs across multiple campuses and off-campus fully online study programs. The redesign had to cater for these groups and the learner diversity within the groups. Phillips et al. (2012) suggest that investigations in learning technology can have both an evaluative and a research focus. The redesign had to respond to pedagogical challenges of the subject, characteristics of learners and to external guidelines determined by NCAT.

The traditional format of two-hour lectures and the didactic learning space of the lecture theatre did not cater for the discursive and reflective engagement through which pre-service teachers develop an understanding of culture. Access was also an issue, with many pre-service teachers needing to travel from rural areas, juggling full or part-time work and family commitments. As part of the assessment in the traditional format of the subject, pre-service teachers were asked to produce three reflective entries across the subject chain, a formal academic essay and an end of semester examination. The redesign aimed to be more flexible and inclusive in its organisation and pedagogy, driven in part, by more collaborative and technology enabled assessment.

In a 2012 survey of students, 69.23% of respondents reported that they regularly (at least weekly) used mobile devices for accessing email and the Blackboard Learning Management System (LearnJCU). In addition, 53.85% used electronic books/magazines/newspapers. Our institution has one of the highest usages of smart phones and mobile devices to access our learning management system in Australia. The redesign aimed to capitalise on this by utilising a range of electronic sources and media.

The following NCAT guidelines against which the project was evaluated were taken as descriptors to inform the redesign project plan:

- Facilitate pre-service teachers’ learning that is flexible, personalised and reflected in the research literature as best practice
- Encourage pre-service teachers’ active learning
- Provide pre-service teachers with individualised assistance
- Build in ongoing assessment and prompt feedback
- Ensure sufficient time on task and monitor pre-service teachers’ progress

The subject redesign had to facilitate the curriculum aims of encouraging pre-service teachers to critically reflect on the idea of ‘equity’ and how it is currently socially constructed in schools and to extend thinking on how inequitable schooling experiences can be transformed for the future. The subject requires pre-service teachers to develop their capacity to use emerging technologies, and engage in skilled critical reflection, underpinned by a focus on considering implications for their future teaching practice. This process views knowledge not as merely ‘bits’ of information, but as something that has the potential to change the way pre-service teachers perceive ‘education for cultural diversity’ and their future teaching practice.

The learning and teaching philosophy draws on a transformational learning framework, informed by Mezirow’s (1990) theory of transformative learning. Using Mezirow’s transformational learning framework facilitates learning through the following elements: experience, critical reflection and action.

Learning Element	Description	Learning in subject
Experience	Central to the subject is your experience as a person in society, as a student and as a student-teacher. <u>Module 1</u> : Orientation – engagement with the subject; <u>Module 2</u> : Deconstructing culture, identity and social position	Sharing and engaging with narratives and of personal experiences of 'culture'.
 <i>However, our experiences and our perspectives of experiences are socially constructed and not culturally neutral, which is why it is necessary to critically reflect on them.</i> 		
Critical Reflection	As experiences are socially constructed, they can be deconstructed to identify the underlying assumptions, values and beliefs behind what we do as people, students and teachers. Engaging with theories and theoretical frameworks around culture, society and multicultural education provides us with the analytic tools to cast our experience in larger dialogues about equity, including issues such as 'race', gender and socio-economic status. <u>Module 3</u> : Culturally responsive education frameworks	Engagement with subject learning experiences and materials regarding theories, frameworks and models. Assessment task: Critical reflection on experience in this phase.

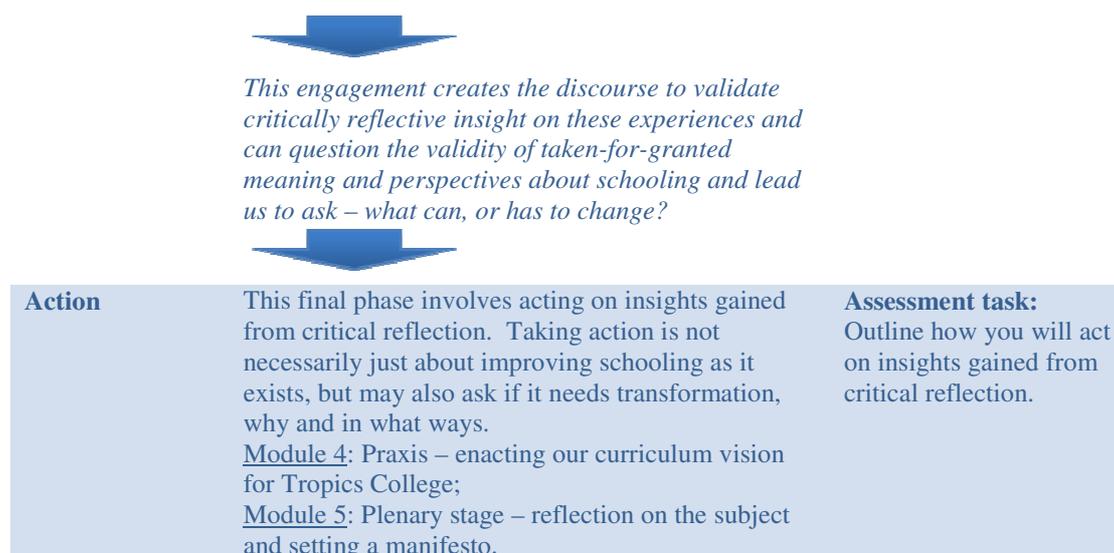


Figure 1: Learning framework

The Redesign Models and Technology: National Center for Academic Transformation (NCAT) Models

To give a purposeful road map on the blended learning, the redesign project was informed by the NCAT models. NCAT has identified six distinct course-redesign models: Supplemental, Replacement, Emporium, Fully Online, Buffet, and Linked Workshop. A key differentiator among these models is where each model lies on the continuum from fully traditional face-to-face to fully online interactions with students. These models give forms of blended learning a purposeful and clearer combination of online and face-to-face interactions with students.

The Supplemental model retains the basic structure of the traditional face-to-face interactions with students, particularly the number of class meetings. Some of the Supplemental redesigns simply add technology-based, out-of-class activities to encourage greater student engagement with subject or course content. While others change what goes on in the class meetings as well as adding out-of-class activities.

The Replacement model reduces class-meeting time, replacing (rather than supplementing) face-to-face time with online, interactive learning activities for students. The assumption is that certain activities can be better accomplished online, either individually or in small groups, than in a class. In some cases, out-of-class activities take place in computer labs; in others, they occur online so that students can participate anytime, anywhere.

The Replacement model was used for the Townsville Internal and Cairns Internal modes. The replacement model reduced in-class meeting time, replaced some in-class time with online interactive learning activities and made significant changes to remaining in-class meetings. Graham et al. (2013) advise blended learning can strengthen a commitment to improve student learning as well as increase side benefits such as access, flexibility, and cost effectiveness.

Traditionally, pre-service teachers were required to attend in-class meetings for three hours each week: two hours for the lecture and one hour for the group tutorial. The redesign eliminated the traditional lecture structure (apart from an introductory and culminating session) and replaced it with online interactive content integrated in LearnJCU, the Blackboard Learning Management System that engages pre-service teachers for more than one hour. The online interactive content enabled pre-service teachers to engage with scenario-based learning activities, online quizzes, videos, and interactive objects in the

modules, and issues that arose in the LearnJCU Discussion Board. In the redesigned subject, pre-service teachers in the internal modes met once a week for two hours to (a) engage with pre-designed theory and empirically supported class activities, (b) engage with short activities that help explain the online component of the subject, and (c) review materials that students find challenging from the previous week.

Components of the Fully Online model which are not 'labour-intensive' were used for the external students. Pre-service teachers in all modes of delivery worked on the same online interactive content. This brought greater alignment and efficiency as all students worked with one online interface for the delivery of the online content. The pre-service teachers in the External mode also met once a week for 1 hour in the online tutorial using Blackboard Collaborate to also (a) engage with pre-designed theory and empirically supported class activities, (b) engage with short activities that help explain the online component of the subject, and (c) review materials that students find challenging from the previous week. The teaching staff facilitated the online interactions, and responded to inquiries, comments and issues raised in the discussions and issues that arose in the LearnJCU Discussion Board.

Phillips et al. (2012) advise that a study of the effectiveness of an e-learning environment may quite easily shed light on *how* learners engage with the designed learning processes to achieve their results, or *why* some learners achieve at different levels, or *how* some learners use the learning environment to achieve a deeper understanding. Phillips et al. argue that while any of these findings could be seen as the outcomes of an evaluation study, they could equally be seen as legitimate outcomes of an educational research investigation.

The Pilot Stage: Implementing the Plan

The redesigned subject was put into action for the pilot phase in second semester 2012 with offerings across campuses and a fully external mode. Phillips et al. (2012) propose that when an e-learning artefact has been developed, it needs to be embedded into a designed learning environment (an event phenomenon) which specifies the interactions between learners, teachers and resources to meet a defined educational need. The teaching staff had confidence that the plans developed during the subject redesign and development were educationally sound, but were uncertain as to the responses from the groups of pre-service teachers.

Observing Learning Opportunities

Using Blackboard Analytics, the teaching staff observed that most pre-service teachers, from both modes of delivery, increased their engagement and interaction with the subject content in the online learning modules. There was increased pre-service teacher-to-pre-service teacher, pre-service teacher-to-teaching staff interaction and pre-service teacher-to-subject content engagement, as well as increased flexibility and independence of the learners compared to the traditional format of the subject in 2011. However, access to online modules and resources (e.g. custom e-book) was a barrier for some pre-service teachers and teaching opportunities.

The teaching staff observed that the redesigned subject engaged pre-service teachers with a personalised learning experience and students received immediate feedback via online quizzes. The online feedback was used by the teaching staff to assess student knowledge and response levels. Further, the online discussions and pre-designed activities pre-service teachers engaged in promoted a strong social presence and reduced the possibility of pre-

service teachers feeling isolated. The online component of the subject increased flexibility for the pre-service teachers' learning that was not previously supported in the traditional format.

Student Feedback and Participation

The online learning modules were successful in engaging pre-service teachers in the External mode and 60% of pre-service teachers in the Internal modes. These pre-service teachers appreciated a much more independent approach to study and highlighted that the online learning activities were useful. Comments made in a survey of pre-service teachers in the external mode:

The Blackboard collaborate sessions were excellent. Even though I was not able to attend them due to work commitments, I thought they were so helpful to listen to and hear other students' thoughts and further explanation by the lecturer on aspects of the assignments and learning materials.

The lecturer used the Blackboard collaborate sessions to interact with us as external students which I really liked although I wasn't able to participate in them often, I would listen to the recordings. I found the praxis unit, Tropics College module to be extremely beneficial in applying what we had learned in the theory.

The online materials enabled us to be creative and analyse, explore and communicate. It was a broad range of assignments given, multiple choice, wiki, discussion board and power points, group blogs and journals, collaborate sessions.

However, the online modules were not very popular with 40% of pre-service teachers in Internal modes who still preferred more face-to-face interaction with the teaching staff. One comment made in a survey distributed to students in week three of the 13 week semester was critical of the reduced contact time and absence of didactic teaching:

Since education is no longer completely publicly funded, education has become a commodity. Therefore, students are now the consumers of education. We are paying for products and services. As a full fee paying, international student I am paying for a service, which includes adequate contact time. I find it outrageous that we are no longer entitled to receiving what we have paid for. If those organising this subject believe it is unnecessary for contact time, please make the appropriate changes to subject delivery. Although the online modules are well constructed and informative, they do not replace the knowledge and expertise of experienced lecturers. Lectures also facilitate collegiality amongst students. Lectures eliminate preconceived notions or false assumptions that may arise from just attending to the online modules and readings in isolation. Apart from that, our tutorials appear to have insufficient time in addressing key issues students are facing.

For this pre-service teacher, who was international and full-fee paying, the Replacement model had not provided the experience they were 'paying for'. The comment reflects the tensions around developing educational 'products' that meet necessary learning outcomes and satisfy the diverse needs and expectations of students. Traditional face-to-face experiences are viewed as more 'valuable' for certain groups of students. The redesign had to be developed to cater to the wide spectrum of student needs including those for whom 'Internal' study should afford more face-to-face interaction. Another element of the delivery had more consistent feedback. The custom e-book, initially chosen for mobility and affordability was prohibitive to pre-service teachers engaging with the readings. There was a need to investigate alternative formats for collating and distributing reading materials.

Feedback on the pedagogy of the subject prompted reflection on the capacities of students as ‘active’ and ‘independent’ learners. When asked what learning experiences had not worked well for them, some pre-service teachers responded:

Having the readings online this is a major annoyance as I cannot fully immerse myself into the work and highlight as I like

Trying to learn from computer screens individually. Cooperative learning experiences work well for me.

Learning all online, I find that information does not sink in as much.

These comments also reflect the experiences of the staff in supporting groups of pre-service teachers who are less equipped to be independent in ways required by e-learning. The pre-service teachers experienced challenges and adequate competences required to participate in an e-learning environment as highlighted by Muresan and Gogu (2013).

Reflection and Pedagogy Improvement

The main tasks and considerations were addressing the need for scaffolding the face-to-face support/peer support in navigating the subject materials. This included using the new teaching spaces and extended tutorial times while maintaining the same teaching load of the pilot. The following descriptors were taken as guidelines to inform the Full Implementation stage:

- Adding more media content and video guides/Camtasia recordings to the online modules.
- Revising the activities so that they can be utilised in the Technology Enabled Active Learning (TEAL) space.
- Revising some aspects of the assessment based on 2012 feedback.
- Compiling online readings and an option of a book of readings based on student engagement with the e-book in 2012.
- Further developing our simulated school context (Praxis – enacting our curriculum vision for Tropics College) for use as a learning and assessment tool.

To support the 40% of pre-service teachers in the Internal modes who prefer more face-to-face meetings, we decided to further scaffold their learning experiences by blending their online, self and peer directed learning with face-to-face interaction with the teaching staff. This took the form of a workshop (a one hour teaching staff facilitated learning followed by a one hour pre-service teacher facilitated learning session). In this modified format pre-service teachers in the Internal modes interacted with the online modules for one hour every week with the help of their lecturer/tutor, and then another one hour to (a) engage with pre-designed theory and empirically supported class activities, (b) engage with short activities that help explain the online component of the subject, and (c) review materials that students find challenging from the previous week.

On one campus this was facilitated by the access to the TEAL room in 2013 and in a modified form on the other. The two-hour workshops in this room included engagement with the online content. To further develop the multimedia resources for the subject, the plan included adding significantly to the online materials including video resources by interviewing teachers, parents, students and other administration and support personnel. These resources would be rich stimulus for the assessment and complement the existing resources.

We also changed part of the assessment regime, which did not reflect online engagement and learning activities. This included removing the end of semester examination and providing more time and weight to collaborative tasks (e.g. using the Wikis) and

individual critical reflections and scenario based learning in Module 4: Praxis – enacting our curriculum vision for Tropics College.

Full Implementation Stage

The pedagogical improvements made in the pilot phase were put into action in second semester 2013 with three modes. Phillips et al. (2012) advise that learning technology investigations often study the activities of learners in a specific learning environment and are aimed at better understanding how technology can be applied and used. And those learning technology investigations can also seek to further our understanding of how students learn with technology.

Observing Learning Opportunities

The redesign in the full implementation stage addressed each of the issues and problems identified in previous offerings and incorporated pre-service teachers' feedback and teaching staff evaluations of the 2011 and 2012 subject offering. Principally, the teaching staff observed that the redesign in the full implementation stage promoted more active pre-service teachers-to-content interaction through the online activities and pre-service teachers' driven scenario based learning.

The workshop format enhanced more interactive online platforms and made pre-service teacher-to-pre-service teacher and pre-service teacher-to-teaching staff interaction easier. It also allowed for more flexibility for pre-service teachers in the Internal mode who have diverse needs based on their work commitments and previous educational experiences. The blended learning approach enabled creative, collaborative, critical, and communicative capacities within the learning environments (Cobcroft, et al 2006).

The new assessment tools enhanced quality by being scenario based, contextualised for a range of social-cultural factors and requiring higher order problem solving and critical thinking. The technology enhanced learning supported socio-technical innovations and improved efficiency (Graham et al., 2013). The redesign enabled more standardisation across campuses and modes of delivery and allowed pre-service teachers and staff members to more effectively manage their learning and teaching.

Student Surveys and Participation

The further scaffolding on the blending of the online, self and peer directed learning with face-to-face interaction with the teaching staff in the workshop format (a one hour teaching staff facilitated learning followed by a one hour pre-service teacher facilitated learning session) was effective with pre-service teachers in the internal modes. With added scaffolding in these sessions 90% of these pre-service teachers felt supported in their learning. These are some of their comments:

The Tropic College module was a good way to interact, although it was at first difficult to know where to start. However, when this was scaffolded I felt supported. I thought the TC website was well set out and accessible. I thought the online modules were great, very informative and a great way, at least for me, to connect to this subject.

This subject has challenged my world views and will inform my future practice.

However, 10% of pre-service teachers in the internal mode were still not satisfied with the workshop format and online learning in general. The percentage of pre-service

teachers in this group dropped from 40% in the pilot phase to 10% with the introduction of the scaffolded workshop format and changes made from the pilot phase. These are some comments from these pre-service teachers:

I just do not like these online modules. I prefer lectures.

Online learning does not work well for me as the lack of accountability in attendance makes me lazy.

Cobcroft et al. (2006) observe the dramatic shift in the characteristics of learners and argue for blended learning environments, and MCEETYA (2005) suggests that students increasingly live and thrive in the digital environment. However, our experience is that we cannot make such assumptions about all our students' digital preparedness to thrive in the online learning environments.

Discussion - Evaluation of the Redesign

Interpersonal Dialogue – A Key Part of the Subject

In the 2012 pilot we replaced the traditional lectures with mostly online materials. Our experience is that this limited the interpersonal dialogue with some pre-service teachers in the internal modes significantly which, in turn, impacted on their engagement and satisfaction. In 2013, we modified the technology enabled learning spaces, which meant the lecture and tutorial were merged into a workshop that blends online learning with face-to-face in ways that are more scaffolded for the pre-service teachers' needs. This enhanced the interpersonal dialogue with and between these pre-service teachers. Our experience is that designing emerging technology enabled teaching and learning spaces that encourage greater student engagement and enhance optimal teaching and learning environments is a complex and multifaceted process. There is need for educators to develop a better understanding of the interactions between learners, teachers and emerging technology enabled learning spaces to meet defined educational goals. There is also further need to develop conceptual frameworks that highlight the important elements in the design of the emerging technology enabled virtual and physical learning spaces. Phillips et al. (2012) consent that investigations in learning technology is a multifaceted phenomenon involving design, development, practice and research. Designing emerging technology enabled virtual and physical learning spaces should focus beyond just developing and implementing nebulous combinations of face-to-face and online teaching and learning.

In line with the transformative intent of the subject, it was important that the organisation of the learning and the emerging technology enabled a sharing of experiences and critical reflections. Our experience is that not all combinations of face-to-face and online teaching and learning results in optimal learning environments. The learning environments that blend online learning with face-to-face in ways that were more scaffolded for the pre-service teachers' needs worked best with smaller class sizes but not for larger class sizes. This was a tension in that smaller face-to-face teaching is the dominant mode of fostering dialogue and pre-service teacher participation and class size is a key cost in delivery of the subject.

Some of the online assessments like quizzes were limited in their application in such a subject where knowledge is presented as contested and theories and strategies need to be critiqued and contextualised. Some pre-service teachers in the Internal mode suggested that learning online individually was problematic in the pilot phase, preferring more face-to-face collaborative work. And using Mezirow's (1990) transformational learning framework meant pre-service teachers needed to share and critically reflect on narratives of personal

experiences of 'culture', theories, frameworks and models central to the subject and take action on insights gained from critical reflection. This meant that the online assessment regime needed to be balanced by introducing collaborative online tasks (e.g. using the Wiki) to enhance pre-service teachers to critically reflect and share ideas.

Standardisation vs Differentiation – Are We Being Responsive?

One of the tensions in a subject that teaches about being culturally responsive to the needs of learners is that standardising materials and forms of delivery across campuses and internal and external modes does not reflect that principle. Our experience is that designing an emerging technology enabled learning space that enhances culturally responsive teaching was not a straight forward process. Culturally responsive teaching and learning spaces consists of an array of interdependent individuals and contextual variables. Standardisation, while efficient in terms of delivery cost may not be efficient in terms of retaining and engaging pre-service teachers because it does not necessarily respond to the needs of individual learners in the Internal and External modes, or between mature learners and school leavers, for example.

In order for a curriculum design to be more responsive to the needs of all pre-service teachers, it should have several layers and pathways of support. Except for the Buffet Model, all the NCAT models for curriculum design represent a more or less one-size-fits-all approach and do not necessarily treat students like individuals. The differences in the physical resources of teaching spaces also accounts for a difference in experiences. Differentiation and responsive pedagogies are a source of ongoing renewal and so efficiencies cannot be found maintaining the same resources across successive offering. And part of the engagement with online materials is being able to incorporate very current and dynamic cultural issues and events.

Implementation Issues – Capacity and Preparedness

Graham et al. (2013) predict that blended learning or technology enabled learning spaces will become the 'new traditional' model in higher education around the world. While an institutional focus can be the designing of emerging technology enabled learning spaces, we suggest that investigations in technology enhanced/blended learning spaces should first seek to understand the learner preparedness, the learning processes that learners experience and the learning outcomes they achieve in these spaces. As Muresan and Gogu (2013) point out, there is need for further investigations into factors affecting online learning processes, in particular the learner's digital skills, self-motivation, self-driven learning capacity, communication skills and cultural awareness. We suggest that this understanding can inform important decisions about the designing of emerging technology enabled virtual and physical learning spaces in education that take into account the complexity of e-learning environments and the multiplicity of factors that influence their impact.

Our experience is that the capacities, confidence and preparedness of the pre-service teachers in being a technology enabled and independent learner limited some pre-service teachers significantly. Here are comments made in a survey of pre-service teachers in the Internal mode:

Online learning does not work well for me as the lack of accountability in attendance makes me lazy. A large amount of long/dense readings also does not help my learning. The sheer density of such reading discourages me from actually reading them, whereas working through concepts as a class or in a more

critical/evaluative/transformational way allows me to process the information better than even if I DID actually do the readings. 8/29/2013

The NMC Horizon Report (2013) calls for leveraging the online skills learners have already developed independent of academia, and MCEETYA (2005) suggests learners increasingly thrive in the digital environment and are comfortable with virtual, screen-to-screen and face-to-face interactions. Our experience is that there is need for several pathways of support to enable some of these pre-service teachers to be enabled online learners. The implementation of a blended learning subject or course is a transition in the ways of communication, the roles of 'teacher' and 'student' and on the ways information is accessed and knowledge is perceived. A new set of pathways need to be made explicit to students so that, as in the case of the student above, they can opt in to a structure that suits them. Our approach needs to optimise the physical and virtual spaces where they can 'work through' materials in collaboration with a capable other and develop critical and evaluative skills.

Conclusion

The whole redesign process has informed our practice for future implications in four areas. The first involves how the redesigned subject has become more applied and has developed to include more authentic and meaningful outcomes. The second is that the redesign process has reinforced the need for synergy/complementary aims, philosophy, pedagogies and assessments. While e-learning approaches may be more flexible and engaging for students, they have to enable the learning elements of our curriculum design, principally sharing experiences, critical reflection and taking action. Thirdly, we have explored how massification and the proliferation of open resources does present easily accessible, customisable and relatively inexpensive ways of engaging students. Finally, the process has shaped our own roles typified by the teacher as DJ metaphor, which is a mash up, a compilation that is crafted and woven together, and is less about knowledge transfer and more so facilitation. We have made more explicit the intent of the curriculum design and our role as facilitators.

The redesign process has highlighted the need to consider the learner at the heart of curriculum renewal. We cannot make assumptions about the capacities of pre-service teachers simply because they are 'gen y'. It is less about the technologies and more about the capacities for independent learning. While interaction can increase in relatively 'natural' ways through the use of technology, the higher order critical reading, organisation and motivation needs to be scaffolded. It is also a transition for pre-service teachers, some of whom are used to the reading packaged transference of lectures notes. Often, the starting point in institutional discussions is about 'what is possible' and focuses on staff preparedness or resource allocation while perhaps marginalising the diverse needs of learners. Particularly in this redesigned subject we had to enact what we aimed to impart to the pre-service teachers.

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