

INSTRUCTIONAL ARTICLE

Augmenting design education with mobile social media: A transferable framework

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ABSTRACT

The paper explores the transferability of a mobile social media implementation framework developed from over 40 projects. We examine how the mobile social media framework is being utilised to augment a traditional physical design studio education context as well as bridging situated student learning experiences beyond the confines of the design studio. Critical to the framework is the creation and nurturing of a lecturer community of practice. The project builds upon the researcher's experience of implementing mobile social media in a similar higher education context at a different higher education institution, and is part of ongoing action research focusing upon transforming pedagogy via mobile social media.

INTRODUCTION

Mobile web 2.0 (or mobile social media) has become almost ubiquitous, with mobile cellular subscriptions outnumbering desktop Internet connections (International Telecommunications Union, 2011), and mobile ownership exceeding 100% in developed countries (Thorne, 2012). However, a major criticism of mobile learning research case studies is that the projects are generally neither sustainable nor transferable beyond the original context (Rushby, 2012; Traxler, 2011; Wingkvist & Ericsson, 2011). This project uses an action research methodology (Swantz, 2008; Wadsworth, 1998) to explore the potential of mobile social media to enhance teaching across two different higher education contexts. The project draws upon a mobile web 2.0 framework developed over four years of mobile web 2.0 project iterations within several higher education contexts including the Bachelor of Product Design at a large Polytechnic in New Zealand. The paper analyses the transfer of this framework from its original context to that of one of New Zealand's Universities. The paper begins by outlining the developed mobile web 2.0 framework.

A Mobile Web 2.0 Framework

Based upon theoretical foundations derived from social constructivism, communities of practice, a conversation analysis framework, and authentic

learning, a mobile web 2.0 framework (Cochrane & Bateman, 2013) was iteratively developed from the experiences of 35 mobile web 2.0 action research projects between 2007 and 2011. The framework addresses six critical success factors for achieving significant pedagogical change from mobile web 2.0 projects that were identified by analysis and comparison of the 35 projects with an extensive review of existing literature reporting on mobile learning (Cochrane, 2010a, 2012a, 2012b).

Mobile web 2.0 critical success factors: The six identified critical success factors include (Cochrane, 2012a):

1. The pedagogical integration of the technology into the course and assessment.
2. Lecturer modelling of the pedagogical use of the tools.
3. Creating a supportive learning community.
4. Appropriate choice of mobile devices and web 2.0 social software.
5. Technological and pedagogical support.
6. Creating sustained interaction that facilitates the development of ontological shifts, both for the lecturers and the students.

The Pedagogy, Andragogy and Heutagogy (PAH) Continuum

Hase and Kenyon (2000) introduced the concept of heutagogy as an extension of andragogy. Blascke (2012) concisely describes heutagogy as student-determined learning. Luckin et al. (2010) argue that while heutagogy is traditionally reserved for the domain of graduate students (Table 1), student-directed learning can be implemented at any educational level, and need not be seen as a strictly linear progression, instead the distinction between pedagogy, andragogy, and heutagogy should be seen more as a continuum of pedagogical paradigms rather than distinct stages. Luckin et al. applied the pedagogy, andragogy and heutagogy (PAH) continuum within the concept of learner-generated contexts.

Table 1. The pedagogy, andragogy and heutagogy (PAH) continuum (from Luckin, et al., 2010, p 78)

	Pedagogy	Andragogy	Heutagogy
Locus of control	Teacher	Learner	Learner
Education sector	Schools	Adult education	Doctoral research
Cognition level	Cognitive	Meta-cognitive	Epistemic
Knowledge production context	Subject understanding	Process negotiation	Context shaping

We utilised the concept of the PAH continuum as a measure of the level of pedagogical change achieved by a mobile web 2.0 project, as the outcomes of each project resulted in enabling teaching practice and reimagined assessment strategies that shifted from teacher-directed to student-negotiated or learner-generated contexts (Luckin et al., 2010).

Scaffolding the PAH continuum: The goal of action research is to bring about change. And, in the context of this research, that change is defined as pedagogical change involving conceptual shifts for both the lecturers and the students involved. These conceptual shifts require the participants to recategorise their understanding of both teaching and learning. These ontological shifts were scaffolded (or supported) by following a three-stage implementation, following a progression along the PAH continuum from teacher-directed pedagogy to student-directed heutagogy. The teacher's role is critical in designing learning experiences to scaffold this pedagogical shift (Laurillard, 2007; Kirschner, Sweller & Clark, 2006). Beginning in the first year of a course by lecturers introducing the adoption of mobile social e-portfolios for establishing student-generated content, and building upon this in the subsequent two years of the

Table 2. Staging and scaffolding the PAH continuum

Stage	Learning context	Mlearning project focus	Course timeframe	PAH alignment
Level 1	Social collaboration with peers and lecturer Student-generated content	Establishment of student-generated e-portfolios using student-owned mobile devices, LMS and basic web 2.0 sites	One-year certificate programmes, or first year of longer programmes	Pedagogy (lecturer directed)
Level 2	Social collaboration with peers and 'authentic environments' Context aware	Establishing the unique communication and collaboration affordances of student-owned mobile devices	Second year of two-year or longer programmes	From pedagogy to andragogy (students become the content creators)
Level 3	Context independent, bridging formal and informal learning Student-generated contexts	Student-negotiated team projects exploring (for example) mobile augmented reality using student-owned mobile devices	Third year of programme	From andragogy to heutagogy (students become independent learners)

PAH: pedagogy, andragogy and heutagogy; LMS: learning management system;
Mlearning: mobile learning

course as shown in Table 2, so that by the third year of their course the students and lecturers are enabled to implement student-negotiated team projects around student-generated contexts (heutagogy), this approach fulfills critical success factors (CSF) 1 and 6.

Facilitating ontological shifts: In order to facilitate the required reconceptions of teaching and learning from teacher-directed (pedagogy) to student-directed (heutagogy), the projects were structured around several stages or action research cycles as shown in Table 3. These stages include the establishment of a lecturer community of practice (COP) investigating the affordances of mobile social media (CSF 2, 6), supported by the researcher as a technology steward (CSF 3, 5), leading to the appropriate choice of mobile social media for the redeveloped curriculum (CSF 1, 4).

Table 3. Example mlearning roll-out timeframe

Mlearning Project Stages	Timeframe	Process and Outcome
Establish weekly COP with lecturers and technology steward. Establish support requirements. Completion of an initial survey that explores participants prior pedagogical beliefs and practices. Establish lecturer e-portfolios. Establish a collaborative research agenda and research questions, and establish ethics consent procedures.	Semester 1	Lecturers reflect upon their prior pedagogical beliefs and practices. Lecturers share their current course outlines and assessment strategies for collaborative editing via Google Docs. Lecturers develop competency with mlearning. Lecturers explore mlearning pedagogies. Lecturers develop pedagogical mlearning activities based on social constructivist pedagogies
Mlearning projects with staff and students. Implementation of the mlearning activities within each course and assessment.	Semester 2	Students establish mlearning e-portfolios. Increased student engagement. Flexible delivery. Facilitating social constructivist pedagogies and bridging learning contexts.
Lecturers publish and present case studies based on project implementation, these then inform the design of the following iteration of the project.	End of semester 2 and beginning of the following semester	Collaborative research writing based on prior and redeveloped course outlines and outcomes via Google Docs. Conference, journal publications and symposia presentations

COP: community of practice; Mlearning: mobile learning

COPs were used as a framework for supporting these ontological shifts. COP is a social learning theory developed by Lave and Wenger (1991) that has been extended by Wenger (1998) and applied across many learning contexts. We use COP theory as an analytical framework for describing the process of students transitioning from passive recipients of content (a pedagogy of legitimate peripheral participation) to becoming active participants within a learning community (heutagogy). According to Wenger, a COP is sustained by a domain

Table 4. Mlearning project design framework

Learning practice	Mediating circumstances		
Social constructivism	Context	Technology	Agent
Lecturer COP	Lecturer professional development, pedagogical brainstorming	Face to face, scaffolded using LMS, smartphone, Web 2.0 services	Lecturers as peers, with researcher as technology steward
Student and lecturer COP	Pedagogical integration and technical support	Face to face, scaffolded using LMS, smartphone, Web 2.0 services	Students as peers, lecturer as guide and pedagogical modeller, with the researcher as technology steward
Collaboration	Group projects	Social networking, collaborative documents	Google Docs, student peers
Sharing	Peer commenting and critique	Web 2.0 media sites, e-portfolio creation	RSS, student peers, lecturer
Student content creation	Student individual and group projects	Smartphone with camera and microphone, content uploaded to Web 2.0 sites	Student and peers
Reflective	Journal of learning and processes, recording critical incidents	Web 2.0 hosted blog	Personal appropriation, formative feedback from lecturer
Learning context bridging	Linking formal and informal learning	Smartphone used as communications tool and content capturing	Student interacting with context, peers, and lecturers

COP: community of practice; LMS: learning management system; RSS: rich site summary

or shared interest of the participants, which in our case is the potential of mobile social media to enhance teaching and learning. Wenger et al. (2009) highlight the role of a technology steward to guide a COP in choosing social technologies that support the communication and development of COPs. In our case, the researcher took on the role of the technology steward.

We use Chi and Hausmann's (2003) definition of ontological shifts: "*an ontological shift is merely the re-assignment or re-categorising of an instance from one ontological category to another*" (2003, p 432). In our research, the ontological shifts we attempt to facilitate are the re-categorisation of learning from teacher-directed activity to student-generated activity, and the re-categorisation of mobile social media from a purely social usage domain to an educational use domain.

A pedagogical design framework: A pedagogical design framework (Table 4) based upon the work of Sharples et al. (2009) was developed to ensure that appropriate choices of mobile devices and social software (CSF 4) were integrated into the curriculum (CSF 1).

Table 5 illustrates an example of mapping the affordances of mobile social media to a social constructivist pedagogy as an outcome of the pedagogical design framework.

Table 5. Mapping mobile web 2.0 affordances to social constructivist design

Learning practice	Mediating circumstances		
Social constructivism	Context	Technology	Agent
Group projects and team communication	Student collaboration across global boundaries, including questioning, commenting, polling and sharing of student-generated content via web links	Twitter via smartphone with embedded links to student-generated blog posts, YouTube videos, and polling via Polleverywhere.	Modelled by expert lecturers, and appropriated by student peers

METHODOLOGY

In this project, the authors wanted to explore the transferability of the developed mobile web 2.0 framework from the context of one higher education institution to another. There are two research questions informing this project:

1. Can mobile social media be used as a catalyst to drive pedagogical change across an entire programme of study, from teacher-directed pedagogy to student-directed heutagogy?
2. Can an established mobile web 2.0 framework be transferred between the contexts of two different higher education institutions?

Data collection methods included: the collation of participating lecturers and students web 2.0 e-portfolios via rich site summary (RSS) feeds within Google Reader, student pre-project surveys, and informal focus group discussions.

All participants were provided with an outline of the research scope and participation requirements, and signed ethics consent forms.

The participants of the research project included the four course lecturers, the researcher as a technology steward, and the course students.

Rather than conducting an empirical comparison between the previous mode of course delivery and one based upon the introduction of mobile social media, we chose to focus upon explicitly redesigning the curriculum to enable pedagogical change using mobile social media as a catalyst (Kukulka-Hulme, 2010). This involved the collaborative redesign of course assessments and interactivity based upon the unique affordances of mobile social media. Reeves (2005) argues strongly that the reason most educational technology interventions result in a phenomena of no significant difference is that comparative studies invariably reproduce prior activities using new technology. Reeves calls this comparative study approach pseudoscience. Other educational technology researchers have also highlighted the redundancy of simple comparative analysis (Reeves, Herrington & Oliver, 2005; Rushby, 2012). Laurillard (2012) and Balsamo (2012) emphasise the need for collaborative curriculum redesign, and we utilised shared Google Docs to collaboratively redesign course assessments and activities between the lecturers and the researcher. In this way we focused upon moving beyond substitution of prior activities to redefinition, similar to Puentedura's (2006) SAMR model (Substitution, Augmentation, Modification, Redefinition) of educational technology transformation.

Analysis tools included the use of SurveyMonkey for student feedback, discourse analysis of participant blog posts using collated word clouds, and transcription of participant reflective videos uploaded to YouTube and embedded in their blogs. This enabled identification of emerging themes, and this was triangulated against the observation and identification of critical incidents discussed during the lecturer COP sessions and recorded in the lecturers' reflective blog posts. Another rich source was the use of Google Docs for collaborative comparison of previous course assessments with those developed as outcomes of the project.

Applying the framework to a new context

Informed by the mobile web 2.0 framework developed at the researcher's previous institution, the University Product Design mobile social media project went through several foundational stages during the project's initial setup in 2012. These stages began with the establishment of a lecturer COP with the researcher as a technology steward guiding the COP in their choice of appropriate technologies to explore. This exploration initially focused upon enhancing participants' personal productivity, followed by exploring the potential for enhancing teaching practice, promoting the course via a programme blog setup by the lecturers, then the development and implementation of several initial student mobile social media projects within the course.

Lecturer COP: 2012 saw the establishment of the Product Design lecturer COP as a critical foundation for the introduction of mobile web 2.0 into the Product Design course (Cochrane, Antonczak, Gordon, Sissons, & Withell, 2012; Withell, Cochrane, & Reay, 2012; Withell, Cochrane, Reay, Gaziulusoy, & Inder, 2012). The researcher has observed that previous iterations of mobile web 2.0 projects that have failed to achieve any significant pedagogical change have been a result of a failure to establish a supportive COP around the project implementation (Cochrane, 2012c). Therefore, the first step in the Product Design mobile social media project was to establish a lecturer COP. The structure of the Product Design lecturer COP is outlined in Table 6.

Table 6. Outline of the product design lecturer COP

Steps/Topic	Participant outcomes
Establishing a COP	What is a COP? Expectations Ground rules Informed by action research
Mobile devices	Personal appropriation of iPhone 4S and iPad3
Creating an mPortfolio	Establishing reasons for the use of: - Blogging, via Wordpress.com - Twitter
Enhancing productivity	Basic connectivity, collaboration and productivity tools: - Email - Google Docs - Mobile Web - Evernote

Table 6 (continued). Outline of the product design lecturer COP

Managing social media	Establishing tools for filtering, collating, and curating mobile social media, and developing metcognitive skills as essential new digital literacies: - RSS subscriptions via Google Reader - Creating an interactive visual experience via Flipboard
Enhancing pedagogy	Exploring the potential for mobile social media to enable student-generated content and student-generated contexts – designing collaborative learning experiences.
Mobilising the design thinking toolbox	An existing pedagogical initiative for enhancing design thinking was reimaged by the integration of mobile social media and wireless presentation tools.
The scholarship of teaching and learning	Establishing a framework for practice-based research outputs based upon the design and implementation of mobile social media to augment the design studio experience.

COP: community of practice; RSS: rich site summary

The lecturer COP followed the path that was typical of the researcher's previous successful mobile social media projects: beginning with the personal appropriation of mobile social media by the lecturers for enhancing their own productivity, followed by explorations of new pedagogical strategies resulting in student projects and reflected upon in peer-reviewed publications.

Enhancing productivity: A significant first step in the mobile social media project was the appropriation of mobile social media by the course lecturers to enhance their own productivity. Thus, initial exploration of the affordances of the iPad and iPhone began with applications that replicated current practice but added flexibility, connectivity, and collaboration, such as: email, calendar events, and basic web browsing, followed by enhanced collaboration afforded by social media such as: Google Docs, and shared Evernote notes. The ability to utilise the touch-screen interface to sketch and share design ideas was highly valued, as was the ability to post, update, and edit their newly established social media e-portfolios directly from their mobile devices. The lecturer COP explored establishing a culture of collaboration via Twitter among the lecturers, and of curating relevant news and media sources via RSS feeds using Google Reader. An important 'eureka' moment for the lecturers was the introduction of the Flipboard app as a rich visual RSS reader that automatically renders media from RSS feeds creating an interactive magazine-style experience beyond the text-heavy experience of Google Reader. The Product Design lecturers appropriated RSS feed reading via Google Reader rendered in Flipboard as a design-centric

approach to managing and commenting on the potentially overwhelming flow of content that would be generated from establishing student social media e-portfolios and projects within the curriculum.

Enhancing pedagogy: While the course had developed a strong sense of collaboration and community around the physical design studio spaces, there was little integration of blended online tools for interaction. The LMS was predominantly utilised as a document repository and delivery system for uploading course outlines, and final versions of student project reports via PDFs for summative assessment. The mobile social media project initiated and enabled the concept of linking or bridging situated learning experiences beyond the physical studio into the studio experience. Students were encouraged to record ideas and inspiration while on field trips and site visits using their camera phones, instantly upload these, comment on these experiences via Twitter, and reflect upon these experiences on their own blogs. The integration of mobile devices also enabled quicker formative feedback from lecturers to students, sharing of student work beyond physical displays, and released the lecturers from being tied to a fixed desktop presentation system in the physical teaching spaces.

Prior to the mobile social media project, the Product Design course utilised Blackboard for course administration and an institutional installation of Mahara for student e-portfolios. Neither the students nor the lecturers were inspired by the design aesthetic of Blackboard or Mahara, but they became excited about the ability for students and lecturers to personalise and customise their own Wordpress blogs, and to do this directly from their mobile devices either via the Wordpress mobile app or the Wordpress mobile site. Thus, Wordpress.com was chosen as the social media e-portfolio platform for the course. Other mobile blogging platforms explored included Posterous and Tumblr. LinkedIn was chosen as a professional e-portfolio site for the lecturers and the students, while Wordpress, Posterous and Tumblr were used as collaborative project spaces and design journals for the curriculum, supplementing and largely replacing the previous paper-based portfolios.

The first application of mobile social media with third year students was the use of Posterous.com for student team-based projects that investigated ways of enhancing the experience of public transport on Auckland City buses. The Auckland Transport agency was the client for this project, and was able to follow the student projects online and provide feedback directly to the students.

Mobilising the design thinking toolbox: During Semester 2 of 2012, what the lecturers had learnt about mobile social media during Semester 1 was applied to modifying a pre-existing pedagogical project titled the design thinking toolbox. Thus, what was already an innovative teaching tool was further enhanced by

broadening its availability beyond desktop and laptop computers to mobile devices. Aspects of social media were also integrated into the design thinking toolbox making it more interactive than previously planned. The redesigned toolbox enabled lecturers to wirelessly present and interact with the content and students directly from their mobile devices, and quickly search and investigate related themes and discussions in class. Thus, the use of mobile devices enhanced face-to-face classroom interaction.

DISCUSSION

Outcomes of the 2012 COP

The project's goal of using mobile social media as a catalyst for pedagogical change across the Bachelor of Product Design programme was reified in several identified achievements during 2012:

- Course lecturers were equipped with personal iPhones and iPads, plus Apple TVs were setup in classrooms
- A survey of student mobile device ownership was carried out
- A lecturer mobile social media COP was established
- Lecturers are now comfortable using mobile devices and social media
- Dropbox and Google Drive cloud storage were established for file sharing rather than the LMS
- Two mobile social media projects were launched, with students using their own devices
- A programme blog was established to showcase the mobile social media projects
- The design thinking toolbox was redone – from Flash to iPad friendly HTML5
- A successful bid to Vodafone NZ for mobile social media project funding for 2013 was made
- The Product Design studios were set up enabling the iPad as a core teaching tool using Airplay
- All studio groups (Year 1 to Year 3) utilised personal blogs beginning in Semester 2 of 2012
- A major focus of Semester 2 was placed on a design thinking toolbox in year 1 taught via the iPad over a period of four weeks
- Lecturers encouraged and observed the appropriation of student mobile social media within the course
- Reflective practice was evidenced via a research paper for Ascilite 2012 (Withell, Cochrane, Reay, et al., 2012) based upon the 2012 projects

An online slideshow illustrating snapshots of the Product Design COP activity can be found at <http://tinyurl.com/ahlz9fp>. The outcomes of the mobile social media project during 2012 illustrate that a radical conceptual shift occurred within the thinking of the lecturers, where “*mobile social media was reassigned from the category of a purely social tool for informal use into a powerful tool for student-generated content and collaboration within student-generated learning contexts*” (Withell, Cochrane, Reay, et al., 2012). This conceptual shift then led to the reimagining of core tools for supporting a social constructivist pedagogy throughout the programme, illustrated in Figure 1.



Fig. 1. Mobile Web 2.0 enabling design thinking.

As described in Table 1, each level of the framework was associated with a year of the three-year degree. This effectively led to the implementation of the mobile web 2.0 framework across the entire Bachelor of Product Design programme. Thus, the first year of the degree focused upon establishing students mlearning e-portfolios within a guided teacher-directed framework (pedagogy), the second year focused upon introducing student-generated content (andragogy), and the third year focused upon student-negotiated collaborative projects (heutagogy).

Student feedback

Student feedback on the integration of mobile social media into their curriculum was very positive, and resulted in many creative ways of redefining group collaboration, as illustrated by the following third year student reflective blog post:

boundary objects that can be passed between COPs. While this approach involves significant investment from the researcher in terms of time sustaining and supporting a COP around a project, the outcomes in terms of significant pedagogical change achieved and collaborative practice-based research output make the effort worthwhile.

Challenges

The implementation of the mobile web 2.0 framework within a new context was not a simple substitutionary process, and required conceptual shifts from the participants, including the lecturers – as evidenced in the following lecturer blog posts in which we see a progression from technology skepticism to technology adoption and the beginnings of redefining prior pedagogical strategies:

May 17: I admit being a little sceptical of the benefits from engaging with an online community. Can't get a cup of sugar from down the road by tweeting. Unless they are tweeting back. They are not.

May 22: At today's (COP) session I made a giant step forward in grappling with managing these social platforms. Google reader is feeding Flipboard. I can now cancel the herald subscription. It was full of trash anyway. Have been looking for an excuse to ditch it. Though it was handy to light the fire.

May 30: A summary?

Dropbox: Has transformed the way I work. No files on a computer, and therefore accessible anywhere. Brilliant. Until an Internet connection is not available.

Twitter: Slowly getting to terms with the potential as a means to filter and broadcast information.

Qk: Got pretty excited about the possibility of live broadcasting a lecture across campus with the iphone. Thankfully prototyped it before the actual event – well and battery went flat. I see the potential for close up applications

Google reader: Paired with Flipboard it is opening up a vast amount of data previously not easily accessible

Flipboard: Lays it out beautifully

Pages: Great, but the keyboard is not user friendly. Needs arrow buttons to move cursor. I think.

Daily notes: a good way of recording meetings etc. I have now

completely dropped visual diary. I do like a pen and paper, and can still use and photograph... (Lecturer blog posts, 2012)

These conceptual shifts took time, and establishing the lecturer COP as an essential element of a lecturer's already busy time schedule required experimentation and negotiation based upon building trusting relationships between the researcher as the technology steward and the participating lecturers. This included working with the institution's IT services unit to ensure that the wifi and audio-visual infrastructure were up to the task of implementing the project, so that the lecturers were confident in exploring new classroom interactivity and assessment approaches. A new culture was also required among the students as their previously personal mobile devices were redefined as core collaborative tools, resulting in the expectation of smartphone or wireless tablet device ownership.

Next steps

The success of the impact of the mobile social media project within the Product Design course in 2012 led to the planning of several projects in 2013 that built upon the experiences of these initial projects. In particular, a partnership was established with Vodafone New Zealand and Auckland Transport to extend the student team-based bus-trip project which ran in 2012 to a higher level in 2013. As part of the 2013 project, Vodafone New Zealand supplied all third year Product Design students with an iPad mini for 2013 for exploring how the Auckland Transport experience could be enhanced via mobile social media. The exploration and integration of mobile social media during 2012 also significantly influenced the design of new studio spaces for 2013 when the programme moved into a new building. Key design elements in the new studio spaces include: standing workstations rather than seated, soft-furnished seated areas for collaborative teamwork, wireless connectivity for mobile presentation systems allowing screen-mirroring and audio streaming from mobile devices for presentations and group work, and removal of the teacher-centric fixed desktop presentation systems. The integration of mobile social media within the Bachelor of Product Design at the researcher's previous institution led to the implementation of several international collaborative projects (Cochrane, 2010b, 2011; Cochrane & Flitta, 2011) and the establishment of an on-going international COP (Buchem, Cochrane, Gordon, Keegan, & Camacho, 2012; Cochrane et al., 2011). Similar international projects will be explored within the researcher's new institution and the Product Design Bachelor and Master's programmes during future iterations of the project. Potential international projects will focus upon facilitating student-generated team projects with team members that are physically located around the world in other Product Design courses, collaborating synchronously and asynchronously via their own mobile

devices and mobile social media such as Google Plus Hangouts, Twitter, and Google Docs, and sharing their work via Wordpress blogs with embedded YouTube, Vimeo, and other social media elements.

CONCLUSION

Utilising the researcher's established mobile web 2.0 implementation framework has led to significant pedagogical and structural change within the context of another higher education institution. Thus this necessarily brief overview illustrates the transfer of a mobile social media implementation framework from the context of one institution to another. A significant element in facilitating the transferability of this mobile social media framework is the role of the researcher as the technology steward across both of these institutional contexts. The project has been a catalyst for developing a whole new studio teaching and learning experience for students in 2013. This has led to the planning of transformable learning spaces, mobile furniture standing tables, mobile wireless projection, and improving technologies to enable better student collaboration. In short the COP has led to conversations and action on a bigger scale across the entire programme. The framework is also being explored within wider international contexts where the researcher's role is virtual and collaborative with like-minded lecturers from a variety of universities of discipline contexts (Buchem, Cochrane, Gordon, Keegan, & Camacho, 2012; Cochrane et al., 2011). It is hoped that this framework may also be useful for other educators to explore and modify as applied to their own contexts.

REFERENCES

- Balsamo, A. (2011). *Designing culture: The technological imagination at work*. USA: Duke University Press.
- Blaschke, L. M. (2012). Heutagogy and lifelong learning: A review of heutagogical practice and self-determined learning. *The International Review of Research in Open and Distance Learning*, 13(1), 56-71.
- Buchem, I., Cochrane, T., Gordon, A., Keegan, H., & Camacho, M. (2012). Mlearning 2.0: The potential and challenges of collaborative mobile learning in participatory curriculum development in higher education. In I. A. Sánchez & P. Isaias (Eds.), *Proceedings of the IADIS International Conference on Mobile Learning 2012* (pp. 311-314). Berlin, Germany: IADIS International Association for Development of the Information Society.
- Chi, M., & Hausmann, R. (2003). Do radical discoveries require ontological shifts? In L. Shavinina & R. Sternberg (Eds.), *International handbook on innovation* (Vol. 3, pp.

- 430-444). New York: Elsevier Science Ltd.
- Cochrane, T. (2010a). Exploring mobile learning success factors. *ALT-J, Research in Learning Technology*, 18(2), 133-148.
- Cochrane, T. (2010b, 5-8 December). *Twitter tales: Facilitating international collaboration with mobile web 2.0*. Paper presented at the Curriculum, technology & transformation for an unknown future. Proceedings 27th Ascilite Conference, Ascilite 2010, Novotel Sydney Brighton Beach, Sydney, Australia.
- Cochrane, T. (2011). Reflections on 4 years of mlearning implementation (2007-2010). *International Journal of Mobile and Blended Learning*, 3(3), 1-22.
- Cochrane, T. (2012a). Critical success factors for transforming pedagogy with mobile web 2.0. *British Journal of Educational Technology* (in pre-print).
- Cochrane, T. (2012b). An mlearning journey: Mobile web 2.0 critical success factors. *International Journal of Handheld Computing Research*, 3(2), 44-57.
- Cochrane, T. (2012c). Secrets of mlearning failures: confronting reality. *Research in Learning Technology*, 20 (ALT-C 2012 Conference Proceedings - A confrontation with reality), 123-134.
- Cochrane, T., Antonczak, L., Gordon, A., Sissons, H., & Withell, A. (2012). Heutagogy and mobile social media: post web 2.0 pedagogy. In M. Brown, M. Hartnett & T. Stewart (Eds.), *Ascilite 2012: Future challenges, sustainable futures* (pp. 204-214). Wellington, New Zealand: Ascilite.
- Cochrane, T., & Bateman, R. (2013). A mobile web 2.0 framework: Reconceptualizing teaching and learning. In M. Repetto & G. Trentin (Eds.), *Using network and mobile technology to bridge formal and informal learning* (Vol. in pre-print). Genoa, Italy: Chandos Publishing.
- Cochrane, T., Bateman, R., Buchem, I., Camacho, M., Gordon, A., Keegan, H., et al. (2011). mlearning 2.0: Fostering international collaboration. In I. Candel Torres, L. Gomez Chova & A. Lopez Martinez (Eds.), *ICERI2011: 4th International Conference of Education, Research and Innovations* (pp. 42-51). Madrid, Spain: IATED.
- Cochrane, T., & Flitta, I. (2011). Mobile web 2.0 integration. In I. A. Sánchez & P. Isaias (Eds.), *Proceedings of the IADIS International Conference on Mobile Learning 2011*. Hotel Palácio de Los Velada, Avilla, Spain: IADIS.
- Hase, S., & Kenyon, C. (2000). From andragogy to heutagogy. *ultiBASE Articles*, (December), 1-10. Retrieved from <http://ultibase.rmit.edu.au/Articles/dec00/hase2.htm>
- International Telecommunication Union. (2011, 16 November). Key global telecom indicators for the world telecommunication service sector. Retrieved June 1, 2012, from http://www.itu.int/ITU-D/ict/statistics/at_glance/KeyTelecom.html
- Kirschner, P., Sweller, J., & Clark, R. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, 4(2), 75-86.
- Kukulka-Hulme, A. (2010). Mobile learning as a catalyst for change. *Open Learning: The Journal of Open and Distance Learning*, 25(3), 181-185.
- Laurillard, D. (2007). Pedagogical forms of mobile learning: framing research questions. In N. Pachler (Ed.), *Mobile learning: towards a research agenda* (pp. 33-54). London: WLE Centre, Institute of Education.

- Laurillard, D. (2012). *Teaching as a design science: Building pedagogical patterns for learning and technology*. New York: Routledge.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Luckin, R., Clark, W., Garnett, F., Whitworth, A., Akass, J., Cook, J., et al. (2010). Learner-generated contexts: A framework to support the effective use of technology for learning. In M. Lee & C. McLoughlin (Eds.), *Web 2.0-based e-learning: Applying social informatics for tertiary teaching* (pp. 70-84). Hershey, PA: IGI Global.
- Puentedura, R. (2006). Transformation, technology, and education. Retrieved February 18, 2013, from http://hippasus.com/resources/tte/puentedura_tte.pdf
- Reeves, T. (2005). No significant differences revisited: A historical perspective on the research informing contemporary online learning. In G. Kearsley (Ed.), *Online learning: Personal reflections on the transformation of education* (pp. 299-308). Englewood Cliffs, NJ: Educational Technology Publications.
- Reeves, T., Herrington, J., & Oliver, R. (2005). Design research: a socially responsible approach to instructional technology research in higher education. *Journal of Computing in Higher Education*, 16(2), 97-116.
- Rushby, N. (2012). Editorial: An agenda for mobile learning. *British Journal of Educational Technology*, 43(3), 355-356.
- Sharples, M., Crook, C., Jones, I., Kay, D., Chowcat, I., Balmer, K., et al. (2009). CAPITAL year one final report (pp. 37). Retrieved from <http://www.naace.co.uk/capital>
- Swantz, M. L. (2008). Participatory action research as practice. In P. Reason & H. Bradbury (Eds.), *The SAGE handbook of action research: Participative inquiry and practice* (2nd ed., pp. 31-48). London: SAGE Publications.
- Thorne, H. (2012). *Information and communications for development 2012: Maximising mobile*. Washington, D.C.: The World Bank.
- Traxler, J. (2011). Introduction. In J. Traxler & J. Wishart (Eds.), *Making mobile learning work: case studies of practice* (pp. 4-12). Bristol: ESCalate, University of Bristol, Graduate School of Education.
- Wadsworth, Y. (1998). What is participatory action research? *Action Research International*, 2002(May 3), Paper 2. Retrieved from <http://www.scu.edu.au/schools/gcm/ar/ari/p-ywadsworth98.html>
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.
- Wenger, E., White, N., & Smith, J. (2009). *Digital habitats: Stewarding technology for communities*. Portland, Oregon: CPsquare.
- Wingkvist, A., & Ericsson, M. (2011). A survey of research method and purposes in mobile learning. *International Journal of Mobile and Blended Learning*, 3(1), 1-17.
- Withell, A., Cochrane, T., Reay, S., Gaziulusoy, I., & Inder, S. (2012). Augmenting the design thinking studio. In M. Brown (Ed.), *Ascilite 2012: Future challenges, sustainable futures* (pp. 1071-1081). Wellington, New Zealand: Ascilite.