

Chapter 2

A Framework for Designing Transformative Mobile Learning

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Abstract In this chapter we outline five mobile social media projects in a variety of educational contexts to explore what works, and what doesn't, providing examples of learning designs that utilise a maturing framework for creative pedagogies using mobile social media. The case studies are drawn from a variety of faculties and departments across one New Zealand University. The context of these mobile social media projects includes Journalism, Product Design, Graphics Design, Digital Media and Law. Our framework is informed by six critical success factors that we have identified and addresses the four levels of institutional stakeholders as defined by this book. In this chapter we attempt to answer two of the key questions addressed by this book: What do effective and sustainable mobile learning initiatives look like in different educational settings and sites across the Asia-Pacific Region? What are the key issues and key design principles that institutional leaders need to consider to support the implementation of sustainable mobile learning initiatives and innovations? The first question is addressed by our example case studies, while the second question is discussed in relation to implementing a framework for designing mobile learning across these case studies.

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2.1 Introduction

Cook (2009) and Sharples (2009, 2010) characterise the development of mobile learning research according to three general phases:

1. A focus upon devices (e.g. Handheld Computers in Schools (Perry 2003))
2. A focus on learning outside the classroom (e.g. MOBIlearn (O'Malley et al. 2005))
3. A focus on the mobility of the learner (e.g. MyArtSpace (Sharples et al. 2007), CONTSSENS (Cook 2010))

However, it is the ability of mobile learning to act as a catalyst for pedagogical change that we find most interesting. This has informed the development of a design framework for mobile learning that is based upon a social constructivist pedagogy that enables learner-generated content and learner-generated contexts. Thus rather than being merely technology centric, we argue that the potential of mobile learning is in being a catalyst for pedagogical transformation (Kukulska-Hulme 2010). Mobile learning presents the opportunity to design learning that moves beyond delivery of content to small-screen devices. Mobile learning enables the design of learner-directed collaborative projects providing learners with authentic experiences of active participation within the community of their chosen profession. In order to do this, we have found that a culture change process is required, or as Balsamo (2011) puts it, our higher education institutions need 'an epistemological upgrade and reboot' (Balsamo 2011, p. 183). This involves a refocus from teacher-directed pedagogy towards student-directed pedagogy and the framing of learning and teaching around the building of authentic learning communities. We argue that the convergence between social media and mobile devices provides a toolkit for designing authentic social constructivist learning environments (Cochrane and Antonczak 2015a, b). We term the convergence of social media with mobile devices through the development of mobile applications (app) and mobile formatted web interfaces as 'mobile social media' (MSM).

2.1.1 *Critical Success Factors*

From our experience of implementing multiple mobile learning projects, we compared successful projects (Cochrane and Withell 2013) with those that did not demonstrate a significant impact (Cochrane 2012), from which we identified six critical success factors (Cochrane 2014).

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 six critical success factors are predicated upon a commitment to social constructivist pedagogy. They are informed by a range of new pedagogical frameworks that include Laurillard's (2001, 2007) conversational framework, learner-generated contexts (Luckin et al. 2010) and communities of practice (COPs) (Lave and Wenger 1991; Wenger 1998; Wenger et al. 2009).

2.1.2 Developing a Mobile Social Media Framework

The limiting factor in applying new pedagogical strategies to learning and teaching is the lack of practical examples of the types of learning and teaching activities and assessments that match the unique affordances of the new technologies being utilised. This often leads to the default strategy of shoe-horning old pedagogical strategies into new technologies and the ultimate conundrum of the no significant difference phenomenon (Reeves 2005). Reeves argues that the substitution of new technologies in education leads to no significant difference in learning outcomes as there is no change in the types of activities and assessments integrated into the curriculum. To maximise the use of new technologies, we should design course assessments and activities that make the most of the unique affordances of the new technologies. Therefore, based upon our six critical success factors, we have developed a simple framework for using MSM for creative pedagogies that focus on enabling pedagogical change from a teacher-directed paradigm (pedagogy) towards student-centred (andragogy) and student-directed paradigms (heutagogy). Borrowing from the work of Luckin et al. (2010) on the Pedagogy-Andragogy-Heutagogy (PAH) continuum, we outline our MSM framework in Table 2.1.

Our framework utilises the PAH continuum (Luckin et al. 2010) to demonstrate how educators can scaffold pedagogical change (or transformation) across the duration of the curriculum and the types of activities and assessment approaches that match the unique affordances of MSM as these are integrated into the curriculum. The framework maps the PAH continuum onto Puentedura's concept of pedagogical transformation described in the SAMR model. The SAMR model defines pedagogical transformation as a process of moving from the use of educational technology as substitution (S) of prior activities and tasks to augmentation (A), modification and finally redefinition (R) where tasks and activities that were previously impossible or difficult with prior pedagogical approaches become possible through the use of educational technology. This pedagogical transformation is achieved through three complementary conceptual shifts leading to exploring relevant changes in pedagogical practice. The first conceptual shift involves an ontological shift in the understanding of the nature of MSM – moving the use of MSM from a purely social domain to an educational domain. This involves the dimensions of professional development for lecturers to effectively use MSM within authentic professional

Table 2.1 A framework for using mobile social media for creative pedagogies

	Pedagogy	Andragogy	Heutagogy
Activity types	Content delivery	Teacher as guide	Teacher as co-learner
	Digital assessment	Digital identity	Digital presence
	Teacher-delivered content	Student-generated content	Student-generated contexts
	Teacher-defined projects	Student-negotiated teams	Student-negotiated projects
Locus of control	Teacher	Student	Student
Cognition	Cognitive	Metacognitive	Epistemic
SAMR (Puentedura 2006)	Substitution and augmentation	Modification	Redefinition
	Portfolio to ePortfolio	Reflection as VODCast	In situ reflections
	PowerPoint on iPad	Prezi on iPad	Presentations as dialogue with source material
	Focus on productivity	New forms of collaboration	Community building
Creativity (Sternberg et al. 2002)	Reproduction	Incrementation	Reinitiation
	Knowledge production	Subject understanding: Lecturers introduce and model the use of a range of MSM tools appropriate to the learning context	Process negotiation: Students negotiate a choice of MSM tools to establish an ePortfolio based upon user-generated content
Ontological shift	Reconceptualising MSM: from a social to an educational domain	Reconceptualising the role of the teacher	Reconceptualising the role of the learner
Self-perception (Danvers 2003)	Learning about	Learning to become	Active participation within a professional community

Modified from Luckin et al. (2010)

scenarios and the initial establishment of MSM as the basis for student-owned ePortfolios. The second conceptual shift involves building learning communities where lecturers become participants alongside learners in exploring the unique affordances of MSM within their specific course contexts. The third conceptual shift involves students taking responsibility for building their own project teams and becoming active participants within an increasingly professional-focused commu-

Table 2.2 Matching institutional perspectives to an MSM framework

Institutional levels	Critical success factors	Key MSM framework elements
The student	1, 2, 3	Scaffolding ontological reconceptions via active participation in learning communities
The teacher	1, 5, 6	Scaffolding pedagogical and ontological reconceptions via building learning communities
Process and policy	4, 5	Establishing a supporting infrastructure Acceptable use policies
Strategy	2, 4	Development of a BYOD strategy Professional development strategy

nity (Danvers 2003). It is at this third level that lifelong world views are developed, and the unique affordances of MSM can be leveraged to redefine (Hockly 2012; Puentedura 2011) new approaches and ideas (Sternberg et al. 2002) to real-world problems and goals.

2.1.3 Four Levels of Institutional Perspectives

Implementing our MSM framework requires engagement with all four institutional levels of the mobile learning evaluation framework (Murphy and Farley 2012) as illustrated in Table 2.2: the student perspective, the teacher perspective, processes and policies and institutional strategy.

These are illustrated in the following case studies and examined in more depth in the discussion section of this chapter.

2.2 Case Studies

We have implemented our MSM framework within a variety of tertiary education disciplines, which we present here as a multiple case study. Each of the five following case studies illustrates the implementation of our MSM framework within a specific curriculum context at one university in Auckland, New Zealand. Each case study followed a common methodology informed by the researchers' six critical success factors:

- Each project began with the establishment of a collaborative community of practice (COP) of departmental lecturers and an academic advisor.
- The participating lecturers were supplied with mobile devices.
- A range of mobile social media platforms were explored by the COP.
- A collage of mobile social media platforms were chosen that were appropriate to each curriculum context.

- These were then integrated into the curriculum activities and assessment strategies of a specific class of students utilising a BYOD approach to student mobile device ownership.

Ethical consent procedures were followed in ensuring informed consent from the participating students in each case study. The common research question was exploring the potential of MSM to transform the design of the curriculum towards more authentic student learning experiences. Data collection procedures included face-to-face semi-structured interviews, collation of mobile social media via a project hashtag and online surveys. Participants were asked to create a professional profile and portfolio comprised of a variety of social media networks, including a reflective blog, and participation within a group discussion forum such as a Google Plus communities. Data analysis procedures included a mix of qualitative and quantitative measures, using thematic content analysis via triangulation of interviews, surveys, focus groups and participants' use of social media analysed via archived posts and comments as well as visual conversational analysis tools such as TAGSExplorer (Hawksey 2011) for Twitter.

In each case, these were longitudinal projects that have been initiated by the development of a collaborative COP between small groups of course lecturers and academic advisors. These COPs are effectively peer support groups with the academic advisors taking on the role of technology stewards of mobile learning as core members of the COP, rather than the traditional role of an external expert. In part, the development of a new professional development strategy has both enabled and been informed by this COP approach, with institutional funding providing both access to mobile technologies and time release for the participating lecturers in these projects. This partnership has also enabled working with the institution's IT department to enable the roll out of a supporting Wi-Fi and audio-visual presentation system infrastructure throughout the university. As these case studies have attracted recognition from institutional leaders, the projects have also informed institutional strategy. In each case study, we highlight the impact of our MSM framework at the four institutional levels.

2.2.1 Product Design

A COP of product design lecturers was established in 2012 to explore ways of enhancing the Atelier design studio environment adopted by the programme by integrating the utilisation of MSM for student-owned ePortfolios and collaboration (Cochrane et al. 2012). A strength and limitation of the design studio environment was its focus upon a specific physical collaborative studio for each student cohort. While this model enabled a highly interactive physical learning environment, it tended to shelter students from interacting with authentic learning environments and limited collaboration with clients and remote student groups. Student portfolios were a combination of paper-based evidence and an institutionally hosted online

Mahara ePortfolio system. One of the outcomes of the COP was the ‘prototyping’ of the integration of new social media tools and mobile devices within a learning environment (course). This included the use of the WordPress.com online blogging tool as a way for students to effectively document their individual or collaborative design process and as a reflective learning tool. Another development at the infrastructure level was the design and construction of portable wireless screen mirroring systems for mobile devices, nicknamed MOAs or MOBILE Airplay screens (Cochrane et al. 2013b).

Impact on students	Many students enjoyed documenting and reflecting more ‘freely’ about how they were going throughout the design process via their WordPress blog. Some students, however, found expressing opinions and reflections in such a ‘public’ way a little intimidating and challenging at first. It was important to provide students with a recognised model, and a set of associated questions, to support their reflective process. The WordPress blog did provide an effective mechanism for students to report on, review and collaboratively reflect on their entire design process at the end of the project. The MOAs were particularly effective in assisting students to work in small teams and easily share and discuss videos and images of their research work that was undertaken in an authentic context, outside of the studio environment.
Impact on pedagogy (the teacher)	The COP provided a supportive platform for product design staff to begin to engage with, and explore the opportunities afforded by, social media and mobile devices to augment and enhance the physical studio learning environment. This included opportunities to better support student collaboration, better support the documentation and sharing of design work throughout the design process and the ‘bridging’ of the physical studio environment with authentic learning contexts, such as ethnographic research undertaken by the students. While some of the lecturers were relatively sceptical at first regarding the use of social media in a learning environment, the ‘hands-on’ experiences and discussions within the COP helped shift initial assumptions and preconceptions. This resulted in an ontological shift in the lecturer’s understanding of not only how the physical learning space can be augmented and enhanced but also how student-generated content and student-generated learning contexts could be enabled. This represented a move along the continuum from Andragogy towards Heutagogy.
Impact on departmental process and policy	The work was undertaken in the COP, the ‘prototyping’ of innovations within the learning environment, and the ontological shift in the lecturer’s understanding delivered the product design department with a framework for implementing broader pedagogical change across the programme. For example, the use of WordPress blogs as a core documentation, sharing and reflection platform was implemented across all product design studio courses. In addition, this prompted a revision of assessment and feedback practices by the lecturing staff, which subsequently included more responsive use of social media and assessment of blogs and other online work. The production and refinement of the MOAs, and the uptake of them in other programmes, also demonstrated the transferability of the MSM framework (Cochrane and Withell 2013).

Impact on institutional strategy	In 2013, students were supplied with an iPad mini each to use as their own mobile device throughout the length of their third year of the course. Combined with the development of mobile wireless screen mirroring technologies (MOAs), the 2013 iPad project informed a subsequent student-owned BYOD mobile device strategy.
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2.2.1.1 Journalism

Ever since the impact of MSM on the events described as the 2011 ‘Arab Spring’, it has been evident that the nature of journalism and news dissemination has been radically affected by MSM (Hirst 2011; Rusbridger 2011). As a response, we began exploring ways of integrating the authentic use of MSM into the Journalism curriculum in late 2011 and have iteratively built upon this over the last 3 years (Cochrane et al. 2013a, b).

Impact on students	Students began with <i>some</i> knowledge of MSM and gained an understanding of the academic and critical framework behind it, which informed their practical exercises and assessments. The students responded well to the heutagogical (student-determined) teaching approach, and some outstanding course work was achieved. The lecturers found critical success factors (Cochrane 2012) of modelling use of the tools, creating supportive COPs within the tutorial groups, and creating sustained interaction that facilitated the development of ontological shifts (particularly during online digital identity assessment) most effective.
	Pivotal to the successful integration of mobile and social media into the Journalism curriculum has been the development of an undergraduate Mobile Journalism course that has augmented the way the students were engaging in news conversations through social media with newsmakers and audiences or ‘users’. Students studied social media theories applied to 36 differing mobile and social media tools within the context of news gathering and communication studies. The traditional newsroom production terminology of ‘researching, reporting and publishing’ was substituted with ‘capture, curation and sharing’, and these were applied to the weekly generation of content that was curated and shared in a ‘Storify’ for assessment at the end of the semester.
	Through theory and practice, students who were already engaged in a number of social media learned to identify how these tools could enable them to gain stronger connections with the news agenda and broaden their reach to potential audiences. For example, one student critiqued and modified his profile information and began using hashtags in order to participate in political conversations on Twitter. Before the end of the 12-week semester, the student was being ‘followed’ by the Prime Ministers of both New Zealand and Australia. Another student became ‘friended’ by the daughter of Hollywood A-lister, Bruce Willis, where they shared thoughts on the cultural differences between New Zealand and America on a gender-related issue. In this way, mobile and social media was used to broaden students’ geographical reach and connect with participants they would not previously have had the confidence nor ability to gain access to.

Impact on pedagogy (the teacher)	<p>Lecturers followed a heutagogical approach whereby students would determine how the social media tools were applied to meet prescribed marking criteria. For example, an assessment required the production of eight pieces of social media content featuring any tool they wished to choose, but the marking criteria required the content to demonstrate ‘... differing forms of mobile social media. Content should be location/GPS enabled, tagged, and feature keywords where necessary. Your content is to be “shared” with others and demonstrating the receipt of “likes” or “comment”. These pieces of content will be curated into a Storify with a <i>total</i> of 1,000 words giving context and analysis on the social media tool you have used, and how it has enabled the production of the item. Your submission should feature academic citations and references; APA referencing is required’ (Assessment criteria 2013).</p> <p>Lecturers gained insight into the students’ learning experiences throughout the semester, through the use of reflective blog posts shared between the student and their lecturer to archive their thoughts and experiences. In addition, a live blogging tool, ‘TodaysMeet’, was accessed during all tutorials, and students were encouraged to post live comments, queries or suggestions, which were referred to at various times throughout lectures and tutorials. This has been effective as, in our earlier research, it had been identified that students who demonstrate a reluctance to participate in open verbal discussion in a classroom environment often prefer using backchannel live blogging tools such as ‘TodaysMeet’ to contribute to discussion as they appear to feel more confident online.</p>
Impact on departmental process and policy	<p>The archiving of processes and learning outcomes achieved within the Mobile Journalism course has informed a plan and strategy for the development of implementation of mobile and social media throughout the Journalism curriculum (Cochrane et al. 2016). An international collaboration with a visiting scholar from the Missouri School of Journalism has enhanced a mobile-first focus among student work. We continue to rework an entire curriculum to be anchored in mobile and social learning and the principles of heutagogy informed by our MSM framework (see Table 2.1).</p>
Impact on institutional strategy	<p>The redesign of the entire Journalism curriculum around a focus upon integrating MSM and a heutagogical pedagogy provides a powerful example for the wider institution.</p>

2.2.1.2 Graphic Design

In 2012 we invited a group of Graphic Design lecturers to participate in a COP that explored nine different MSM apps. The MOBCOP (mobile community of practice) met over 6 weeks to explore the pedagogical potential of these apps, and then the participants brainstormed ideas for curriculum integration of these tools, designing course activities and assessments that were relevant to their specific course contexts (Cochrane and Antonczak 2013). The following observations are drawn from an ethnography-based approach and analysis via mainly participant observations and qualitative inquiry conducted via written or oral discussions.

Impact on students	<p>The following is a summary of benefits acknowledged by students via their personal blogs or in situ conversations of the redesign of the curriculum around our MSM framework:</p> <p>The development of international exposure via student MSM ePortfolios (Behance, Vimeo, YouTube) and building up confidence in this global ecosystem.</p> <p>The immediacy of feedback and conversations via MSM around student work (Twitter, FB, Google+).</p> <p>A focus on direct collaboration (Google Drive) and indirect/mediated collaboration (posts, likes).</p> <p>Facilitating peer support via both direct and indirect critique (posts, likes).</p> <p>A curriculum redesign based upon heutagogy implemented via student negotiation of the decision-making process and being an active participant in a learning community through the use of tools such as Google Drive and Google Hangouts.</p> <p>Two of the key recommendations are to support students to move beyond their personal habits and Facebook environment and to have an ongoing discussion about online ethos and collaborative values from the beginning of the course to its end.</p>
Impact on pedagogy (the teacher)	<p>This is the most crucial point of impact of the MOBCOP group that acted as a transformation agent in delivering more pertinent and timely content and feedback to students. The following is a summary of the key changes:</p> <p>Developing a more efficient teaching model utilising MSM (YouTube, Google+, Bambuser).</p> <p>Facilitation of more class participation and student empowerment.</p> <p>Facilitating flexible presentation technologies (MOAs, AirServer).</p> <p>Scaffolding students to go beyond their prior experience and comfort zones in education within confined, bounded classroom environments.</p> <p>In order to enhance this success, it might be strategic to use a mixed model of face-to-face and live interaction with online and asynchronous contributions. To do so, one approach is to use generic tools for iOS, Android and Windows devices within a bring your own device (BYOD) strategy.</p>
Impact on departmental process and policy	<p>While it is difficult to clearly identify the changes in terms of departmental modus operandi and ethics, we noticed several key impacts:</p> <p>There was more collegiality developed among the MOBCOP members.</p> <p>The gap between research and teaching was reduced. MOBCOP became a catalyst for developing the scholarship of teaching and learning.</p> <p>MOBCOP has been perceived as an investment for future research collaboration and publications among staff also.</p> <p>MOBCOP helped develop flexible delivery and feedback processes (<i>Hangouts</i> or online support – beyond the classroom) for lecturers.</p> <p>The important point is to get colleagues or staff on board first. Therefore, setting up a series of short demo or hands-on sessions will create a space for mentorship and advocacy. Once staff and colleagues feel more at ease, they are able to model the professional use of these tools to students also.</p>

Impact on institutional strategy	MOBCOP was an excellent strategic fit and contribution to the development of the university's research profile nationally and internationally, such as:
	The development of a mobile social minor programme (https://goo.gl/I2gwhV).
	It led to an increased awareness of MSM as a creative tool.
	It developed a new digital productivity workflow.
	MOBCOP has led to a continuous development and capacity building strategy.
	To summarise, the MOBCOP benefits are various and had multiple impacts for the Graphic Design curriculum in general (student and staff). It enhanced the mobile learning experience via MSM and fostered both students and staff personal development as well as consolidated their professionalism and their mobile production portfolio.

2.2.1.3 Digital Media

In 2013 we formed a COP of digital media lecturers with a specific focus on building student ePortfolios via WordPress and enhancing face-to-face classes with online learning communities using Google Plus communities (Cochrane et al. 2014). Given the nature of the courses offered within digital media and the myriad variety of digital publishing tools in use, focus was given to increasing collaboration and self-directed learning among students. To do this, common criteria were established for assignment submissions across a number of courses. Formerly based around the institutional learning management system (LMS) and paper-based submissions, the criteria expanded the department's existing submission practices by including additional information around background research, weekly work-in-progress updates and rationale, all posted to a student's WordPress blog. Learners were required to comment on their peers' WordPress blogs on a weekly basis. The Google Plus communities acted as a collaborative learning space for learners to ask and answer questions in a more dynamic and mobile-friendly environment than the LMS discussion forums. Students could install the WordPress and Google Plus apps on their smartphones and update their progress from anywhere, while also receiving mobile notifications of comments and course-related updates.

Impact on students	The use of Google Plus saw responses to questions answered much faster, as students could often answer each other's questions.
	Google Plus communities were implemented at the individual course level. This created a more consistent experience for learners across a course in different streams with different lecturers.
	Questions were answered in a public forum, meaning all students benefitted from answered questions, creating a virtual FAQ (frequently asked questions) database.
	The use of WordPress let the students see their peers' work progress and their finished assignments, adding a form of competition and benchmarking.
	The ability to document work in progress provided a feedback loop. This saw students get much more formative support and guidance.
	The ability to post and monitor work in progress through regular blog posts helped prevent students leaving assignments to the last minute.
	The documentation of work in progress also saw plagiarism cases drop dramatically, as it makes plagiarism in practice-based assignments very difficult.
Impact on pedagogy (the teacher)	Learning shifted from being teacher-centred to student-centred and collaborative.
	The Google Plus communities provided a means for course leaders to provide input at a student level.
	Google Plus also removed the walls between streams within the same courses, allowing students and lecturers alike to learn and input beyond their own streams, creating the sense of participating within a larger learning community.
	Office visits from students were drastically reduced. This can be attributed to the Google Plus communities providing additional support. The larger the course, the more potential for help exists within the community.
	Rates of students' contesting marking dropped. As all assignment work is submitted through a channel visible to all students within a course, students have a fairly good idea of the level of their work in relation to the rest of the class.
Impact on departmental process and policy	The use of WordPress and Google Plus is now part of most courses offered.
	The use of work-in-progress posts is now part of most courses offered and is now called upon in any case of marking disputes or plagiarism.
	Staff are seeking new technologies and techniques to improve learning and teaching within the department. The university has begun allocating funds to support this.
	Staff have been offered means to seek accreditation as educational technologists or mobile learning providers in recognition of the work completed.
Impact on institutional strategy	The digital design integration of MSM across the curriculum has provided a model approach that has subsequently been showcased to other discipline contexts across the university.

2.2.1.4 Law

Traditionally a very textual case study-based discipline, we wanted to explore ways of bringing Law pedagogy into the post Web 2.0 era. This involved moving beyond hosting case study materials as PDFs and lecture PowerPoint slides on the institution's learning management system (LMS). The foundation of a Law mobile COP was established in 2013 and expanded in 2014 by exploring the synergies between new pedagogies in Journalism and Law in 2014.

Two projects were piloted: the first involving the introduction of course materials for a second-year compulsory law course *Judicial Review* through a collection of mobile-accessible multimedia content uploaded to the student LMS in a dedicated electronic folder 'iMaterials' and the second involving student-led creation of personal WordPress websites as an integral component of the course research requirement for a third/fourth year elective course *International Environmental Law*.

For the *Judicial Review* iMaterials, approximately half of the course content was made available to students on an Apple iBook platform. iBook chapters were developed containing the relevant week's reading materials including embedded PDF copies of judicial decisions, text and video commentary and links to dynamic online content such as law blogs and law commentary websites together with an introductory video podcast from the law lecturer. An alternative version of the electronic materials in conventional PDF format was made available for students without IOS devices. The pilot project initially developed in 2014 was extended in 2015 to cover approximately three-quarters of the course content, and the iBook platform evolved to a generic e-book platform accessible to students with both IOS and Android mobile devices.

The *International Environmental Law* elective provides an introduction to theories of international environmental law, including concepts of state sovereignty, and jurisdiction and liability in the area of international environmental protection. Topics include the international law framework for climate change, law of the sea, biodiversity protection, nuclear testing and international trade and environment. These inherently global subjects lend themselves particularly well to student-led online research platforms, where fellow class members and members of the international environmental community alike are able to interact online, exchanging information and views through the comments facility on WordPress-hosted websites and other MSM platforms such as Twitter.

As part of a compulsory research component, students could opt to develop their own online research websites to supplement text-based research activity. Approximately 75% of the class chose to develop their own WordPress websites which became an important part of their research activities, also allowing a much greater degree of interaction between students on their self-selected research topics.¹

¹For examples of class websites, see <https://ielsustainableenergy.wordpress.com/>; <https://ashbarwood.wordpress.com/>

Impact on students	Students in both classes responded very well to the initiatives. <i>Judicial Review</i> students reported an increased understanding and level of engagement in the (sometimes challenging) course content, which was also reflected in higher and more informed participation in class discussions. After getting over the ‘hump’ of technical challenges of the development of their personal research websites in the <i>International Environmental Law</i> course (a majority of the students had never attempted to create or operate their own website before), students demonstrated an impressive degree of initiative and creativity in the presentation of material relevant to their chosen research topics, aligned with a heutagogical redesign of the assessment. More importantly, the online platform allowed a greater degree of interaction, which in turn supported the overall learning objectives for the course.
Impact on pedagogy (the teacher)	The initiatives had positive impacts on pedagogy in different ways for the two initiatives. The act of development of digitally based course content in an iBook/e-book platform for <i>Judicial Review</i> forced the lecturer to distil complex and wide-ranging materials (such as lengthy judicial decisions and jargon-laden legal commentary) into clear and succinct summaries, benefiting both students and the lecturer in and outside of the classroom. For <i>International Environmental Law</i> , the need to model website structure and content for students (the main LMS for the course was also contained on a WordPress website) allowed the lecturer to share the experience of dynamic online interaction on the topic, through regular Twitter activity as well as commentary on class websites, thus modelling the professional use of these tools.
Impact on departmental process and policy	Working with other members of the law school, lecturer involvement in these two projects contributed to ongoing law school innovation in pedagogy. Although the impact on departmental processes were modest, the modelling of digital and MSM facilities appears to have planted seeds of ideas in colleagues which, in time, are expected to reach fruition through dissemination of these techniques in other courses.
Impact on institutional strategy	Again, while impacts of these projects on institutional strategy are likely to be modest, the modelling of innovative techniques contributes in a small way towards wider institutional awareness of the opportunities associated with digital and MSM technology in what has traditionally been a very conservative discipline.

2.3 Discussion

Transformative mobile learning is not automatically the result of simply implementing a BYOD strategy across an institution. Of itself a BYOD strategy provides flexible anytime, anywhere access to traditional course content and activities but no significant difference in learning outcomes. The identification of six critical success factors for transforming pedagogy via mobile social media provides the starting point to support and inform curriculum redesign. Designing for transformative teaching and learning using mobile devices requires a redesign of course activities, assessments and most importantly a reconception of the role of the teacher and the learner. Our MSM framework explicitly scaffolds these reconceptions and focuses

upon the affordances of MSM to enable building authentic learning communities within specific learning and professional contexts. Each of the preceding five case studies illustrates our attempts to put this framework into practice within a variety of curriculum contexts, with varying degrees of development along the Pedagogy-Andragogy-Heutagogy (PAH) continuum (Luckin et al. 2010). In this section we highlight the impact of our framework for designing transformative learning experiences using MSM from our case studies across the four institutional levels.

2.3.1 Impact on Students

Designing transformative mobile learning requires a focus upon student-owned devices, and this necessitates learning environment designs that are accessible via a wide range of platforms (iOS, Android, Windows, OSX, Chrome, etc.). We argue that the convergence of mobile devices and social media provides a platform-agnostic solution to supporting a wide range of student-owned devices, allowing for student-determined learning (heutagogy) and minimising the ‘digital divide’ by enabling students to use the devices they already choose to own. Our framework scaffolds a reconception of MSM from a purely social domain towards students developing professional social media practices and portfolios. The nature of this portfolio depends on the discipline context – for example, graphics design students established Behance portfolios (an online graphic design professional network), while product design students preferred to use WordPress as a portfolio hub. This flexibility of choice of MSM platforms enables a cost-effective approach to support the development of student professional portfolios within the Asia-Pacific Region where educational budgets tend to be more limited than the resources available through the European Union- or US-specific funding models.

2.3.2 Impact on Pedagogy (The Teacher)

Lecturers need support structures and realistic timeframes for learning how to integrate mobile devices and MSM into their own workflows and into the curriculum. This is complicated by the exploration of new pedagogies that are often foreign to many lecturers as they leverage the unique affordances of MSM for collaboration and student-centred pedagogies. We have found the formation of sustained COPs made up of departmental lecturers and a supporting technology steward an effective way of scaffolding these cultural and ontological shifts. The establishment and nurturing of departmental COPs is a fundamental critical success factor within our MSM framework.

2.3.3 Impact on Departmental Process and Policy

We embed our MSM framework within departmental COPs. This has two main outcomes: Firstly, the collaborative curriculum redesign process is nurtured and sustained over at least a year and in many cases several years. Secondly, the COP creates a snowball effect drawing in other members of the department from the periphery of the project to engage with new pedagogical strategies. Thus the strategies developed through the COP become a model for wider adoption and policy throughout the department. As every COP is fundamentally unique – comprised of a unique group of lecturers and an academic advisor – this represents a transferable strategy that can be implemented within virtually any discipline context. Within the Asia-Pacific context, this is relevant to the mix of many cultural groups that are fundamentally collaborative and social constructivist.

2.3.4 Impact on Institutional Strategy

The institution needs to invest in a robust wireless infrastructure to support student-owned device connectivity. We have found that the number of student-owned devices connecting to our university network doubles every semester, so investment in wireless network infrastructure is critical. Institutional AV systems also need to be redesigned for mobile devices rather than fixed desktop presentation machines. This represents a significant change for institutional IT departments, from controlling and rolling out desktop images for computer-lab based classrooms to empowering student-owned device connectivity and cloud-based platforms. This is particularly relevant to the Asia-Pacific Region where many institutions are exploring large-scale student BYOD strategies (Coyne 2015; National Library of New Zealand 2014; Sweeney 2012; Venaruzzo and Saliba 2016).

2.4 Conclusions

Designing transformative mobile learning requires more than reformatting course content for mobile devices which is what Puentedura (2006) describes as a substitutionary process. Rather the transformation of learning involves redefining what is possible. Supported by the formation of communities of practice as a foundational strategy, our framework provides a guideline for designing new assessment types and course activities that can trigger a redefinition of student learning around student-generated content and student-generated contexts using their own mobile devices and MSM. This represents a ‘move along the PAH’ continuum from teacher-directed pedagogies towards student-determined heutagogy. In the five case studies, we illustrate the design of learning environments that leverage the collaborative and

contextual affordances of MSM based upon a framework developed to meet six identified critical success factors. This framework is effectively a pragmatic mashup of several interrelated models of learning, including the PAH continuum, the SAMR framework, the concept of three levels of creativity and ontological pedagogies. The five case studies illustrate that the framework is not limited to a specific discipline context. Our five case studies also highlight the impact of mobile learning across the four institutional levels of student, pedagogy, process and policy and strategy – a unifying thread throughout this book. While our framework is illustrated within a New Zealand context, we believe the framework can be applicable to wider cultural contexts, particularly across the Asia-Pacific Region where many cultures are inherently collaborative and social, but where educational strategies carry a legacy of traditional teacher-directed pedagogies.

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