Mobile Learning at Charles Sturt University: Lessons learned from university-wide iPad trials in 2012

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The mLearn Project at Charles Sturt University (CSU) started in 2011 as an initiative to explore mobile learning and its application and potential for the institution. This paper provides a meta-perspective of one particular aspect of the project, a series of university-wide device trials, and describes what took place, the initial findings, discussions related to mobile and the key recommendations from the project. The project has provided a way for the university to explore new technology within its specific and unique learning and teaching contexts. It has provided real world experiences from which to learn and through exploration a better understanding of our present has been reached. This paper is an attempt to share the examples and experiences and provide a basis to imagine our future direction.

Keywords: mobile learning, institutional initiative, technology project, innovation, iPad

Introduction and context

In 2011 Charles Sturt University (CSU) established the mLearn project to investigate the potential for mobile technology to be used in all our learning and teaching contexts - both distance, on-campus and in practice-based settings.

The aim of the project was exploratory, seeking to understand what is possible today so that we can start to imagine the future - one might call it mobile dreaming. Large-scale adoption of mobile technology is still very new in the education sector, so the goal of the project has been to gain knowledge, understanding and real world experience. This has been achieved by conducting device trials with our students, our staff and infrastructure.

The trials have been set up in consultation with the Learning and Teaching Sub-Deans, academics and educational designers who set up the parameters for each trial in consultation with a central project team. The central project team consisted of the first author as the project lead, programming staff and representatives from key divisional areas. The project sponsor, who is the second author, facilitated the work of the Steering Committee that has representation from key divisional staff as well as from the faculties. The mLearn project runs from within the Division of Student Learning of which the authors are members. As leaders and immersed contributors to the project, the authors have a unique opportunity to develop a meta-perspective of the trials and provide a 'big picture' to show connections and broad implications. This meta-perspective covers a number of trials, in multiple faculties and in multiple disciplines and is different from largely singular or uni-discipline trials and interventions such as those recently reported by Albion et al. (2012); Goldacre (2012); Steel (2012); Timoko (2012); Tutty (2012); and Watanabe (2012)

The project's design and development has been greatly influenced by the work overseas at Abilene Christian University in their *ACU Connected* project and the *iMedEd* initiative at the University of California Irvine as

well as local initiatives shared through Ascilite from Bond University (Brand, 2011) and The Chinese University of Hong Kong (Lam, 2011). Essential to the project was to build on this prior work and develop of unique and contextual understanding that reflects CSU.

To cope with the fast-paced churn of new technologies and platforms the philosophy of the Project aligns with the model outlined in the Lean Startup (Ries, 2011), and follows the core principle of *Build-Measure-Learn*. The Project is *Build* oriented with a focus on outcomes and actions. These outcomes, those planned and unplanned, will be used to *Measure* results which in turn will allow the university as a whole to *Learn* from the experience. The project is multi-threaded with a number of concurrent areas that cover the trials and the design and development of mobile content and systems. This paper, however, will focus only on the trials as their impact and application runs across disciplines and includes representation from most divisions and all four faculties.

Defining Mobile

One of the biggest challenges we have faced in the project is how to define Mobile. The word 'mobile' has now evolved into an umbrella term used to define the hardware, mobility of the user and the supporting technologies and interfaces. Mobile has become a broader cultural label encompassing the technologies, ideas, customs, and behaviors that accompany these devices. This paper has used the cultural form throughout, except where referring to devices or technology explicitly, but this ambiguity can make the topic quite difficult to navigate and ensure congruent discussion.

Design of the trials

We have chosen to run a number of trials concurrently rather than as small separate projects as grouping them under the one banner makes optimum use of resources and the crossover in knowledge and skills required. The focus has been on encouraging small-scale innovation rather than large-scale outcomes and the trials have acted as an incubator for innovation (Wunker, 2007) and proving ground for new ideas, technology, workflow and praxis. The project has been equipped to provide academic staff and students with access to mobile devices, the required support mechanisms and technically capable staff, so that it can enable staff and put ideas into real world action.

Throughout 2012 and 2013 these device trials were conducted with CSU students and staff using our current infrastructure and learning and teaching contexts. The pilot programs have been structured to be small and have a limited scope, so that multiple programs can be run at the same time and as a whole the project can follow an Agile Methodology (Beck, et al., 2001). The small size makes it much easier to provide focused support to staff and students, affording the ability to change and adapt to resolve issues as they emerge. The aim of this approach is to make it easier to manage risks and reduce failure rates. Shorter timelines for the trials, based around sessional dates, dictated that less time is spent planning and more time doing, and with all the pilots there is a sense of exploration of the possibilities rather than limitations because of the risks involved.

The initial student trials that were conducted during the first session of 2012 were set up through consultation with the Learning and Teaching Sub-Deans in the four faculties who allocated specific subjects and academics. The academics involved and schools' Educational Designers then setup the parameters for the project in consultation with the project's core team. The subsequent trials were set up through an expression of interest open to all staff in the institution for suggestions of trials to conduct in the realm of learning and teaching. These were then screened to align with the objectives of the Project and a number selected to go ahead. The project team provided the required technical support and equipment throughout the trials and were heavily involved in the initial setup and training. A site in the Learning Management System (LMS), our installation of Sakai called *Interact*, was developed allowing access to ongoing support, contact with the team, knowledge base materials, how to guides and video tutorials.

Surveys were conducted at the start and end of each session to learn from these trials and to measure results. The initial survey was designed to gauge participants' access to technology and familiarity with mobile technology. The second survey conducted at the conclusion of the trials asked participants about:

- experiences with the iPad
- experiences with support received in the Project
- activities performed with the device
- time spent on the device
- perceived effect it had on them and their study
- confidence in using the technology
- attitudes towards mobile

- technology preferences
- voicing their views and opinions openly.

The trials can be broken down into three distinct groups:

Phase 1 Student Trials

The first set of trials were conducted in the first session of 2012 and focused on the students' use of mobile technology. iPads were deployed to subjects across three faculties that represented quite different discipline areas and student cohorts. The subjects involved were E-commerce Technologies (ITC594), Investigation: Literacy (EML302) and Nuclear Medicine Science 1 (MRS222). Seven teaching and support staff were also provided with devices.

Phase 2 Staff & Student Trials

The second set of trials were conducted in the second session of 2012 were suggested by academics through an Expression of Interest. The project team and steering committee ensured that the trials chosen aligned with the aims of the project and the strategic needs of CSU. A range of devices - iPads, iPod Touch & Google Nexus tablets - were deployed to across the faculties and included a range of unique and discipline specific applications of mobile technology. These trials are outlined further in the section below.

Library Trials

The library explored the use of iPads and eReaders and the opportunities for lending to students. Initial plans for device lending included supporting students on work placements - also referred to as practice-based learning - lending to remote and distance education students, pre-loading devices with learning resources, eBooks, journal articles, etc. and purchasing apps or other mobile friendly resources.

Conducting the trials

Each trial was to explore unique aspects of how mobile technology could be integrated in the learning and teaching experience. This has provided the project with a range of exemplars and rich findings, each worth of a case study themselves. A brief overview of each trial is provided below.

Library

The iPads and Sony Reader devices were purchased for the Library to explore opportunities for lending to students. There were, however, a number of issues that arose during these pilots. Some of the initial objectives of the Project had to be amended to counter issues relating to licensing and device limitations. For example it was not possible to preload devices with content, nor make the devices available to remote students due to some of the Apple iTunes and App Store terms and conditions and that the lithium batteries used in mobile devices are considered to be dangerous goods, and cannot be transported by air.

Instead, the iPad lending was made available to students on professional placements who had significantly longer borrowing requirements to counter the condition that a device can be associated with only one Apple ID account at any given time and you may switch a device to a different account only once every 90 days. The pilots also ensured that lending terms and conditions were developed, procedures for device management were developed and training for Access Services staff was provided.

ITC594 - E-commerce Technologies

The subject provided the challenge of equipping and delivering support to twenty-one students across multiple cohorts, studying on campus (2 students), by distance (5) and through the Melbourne (8) and Sydney (6) study centres. The devices were used to inform and enhance a research project into mobile technology and eCommerce and provide students with the technologies to explore mobile technology uses. The project was also able to assess the process required for delivery and return of devices to non-internal students.

EML302 - Investigation: Literacy

In this trial twenty-seven students used the capabilities of the device to create multimodal text. They participated in weekly tutorial sessions and were asked to develop writing tasks using the iPad and post these writing tasks to a class blog in an attempt to assess the efficacy of the iPad.

MRS222 - Nuclear Medicine Science 1

This group of thirteen students formed a longitudinal study, as it is a yearlong subject. The same cohort of students has continued their role in the project into 2013. The trial looked at many aspects of integrating the

mobile technology into the classroom including the addition of interactive elements to a standard lecture using responseware. The devices were used to provide an information access point and communication tool for students on placement and provision support to students on placement through video chat. The trial also explored the use of discipline specific applications as a learning resource, multimedia capabilities to record learning practice in a video diary, and leverage 3G technology to provide ubiquitous access to subject materials.

Apps in Nursing - Simulation & Resources

A set of five iPads were deployed to the nursing clinic and used in a number of subjects that ran subjects in this environment. Each iPad was set up with the patient monitor app SimMon to enhance the simulation environment in the skills ward at Albury campus in conjunction with simulation manikins that were already *in situ*. Devices were set up in pairs with one becoming the patient monitor, displaying patient heart rate, blood pressure and SpO2, and the second used by the facilitator to change patient vital signs on the first device (the monitor). This would simulate a deteriorating or improving patient. The iPads were also used to access resources such as e-MIMS for students to look up different drugs and acquire the most up to date information. This also extended to a range of other resources available through CSU Library's extensive digital catalogues.

iPads for Accessibility

Three students who engage with accessibility services evaluated the mobile learning environment and access aspects of iPads. Students were asked to asses how the devices would perform for a user with a vision impairment, utilising on-screen enlargement and text to speech software. The assessment extended to how learning resources may be delivered in a variety of accessible formats.

Demonstrating mathematics using an iPad

A team consisting of seven academics teaching physics in the School of Dentistry and Health Sciences and two staff from Academic Support investigated the use of iPads in mathematically based subjects to improve the student experience and performance. One area in particular was how to reduce or break down the barrier for distance students having difficulty with problem solving. Direct interaction with distance students would enable improved problem solving, concept development and retention in highly mathematical subjects. The staff used a range of apps to record drawing and handwriting with voice to create resources that can be stored and sent to students to explain difficult concepts and problem solving instruction.

iPads for Teaching

This cohort of fourteen academic staff from the School of Community Health and School of Environmental Science assessed the utility of the iPad for a range of tasks in academic roles. This included the use of the iPad to facilitate paperless marking, social media engagement with students, investigation of learning resources, implementation of paperless strategies and the integration of mobile technology into a range of teaching contexts across a range of discipline areas.

iPads for Writing

Five students enrolled in the subject, Writing for Publishing (WRT210), assessed the suitability of the iPad for writing extensively and how to capitalise on its portability and extra functionalities. The trial also investigated paperless marking and the use of social media.

Mobile Devices for Digital Media

Students in the subject, Understanding Digital Media (COM112), investigated the suitability of mobile technology for production of digital media. Students were exposed to a range of technology from consumer grade gear through to professional production equipment. The project provided a large cohort of students the ability to loan iPod touch devices through the existing equipment lab in the school.

Findings

The findings from these trials are based on the two surveys conducted, one at the start of the trial one at the end. In addition to this data are written reports from academic staff and informal one-to-one interactions that occurred between participants and the project team. This feedback has enabled the project to explore how students and staff have utilised the iPads and what their views are about various aspects of mobile technology.

Pre-trial Survey

The pre-trial surveys were used to gather information to understand the participants' general level of knowledge, experience and confidence with the devices. In Survey 1 there were 43 responses: EML309 47%, ITC594 26%, MRS222 28% a response rate of 70%. In Survey 2 there were 14 responses: 4 Students, a response rate of 80%, and 10 Staff members, a response rate of 40%. The key measures from this survey were previous use of iPads,

confidence in using them at the start of the trial and their current ownership of technology at the start of the trials. The following figures show the averages across the surveys.

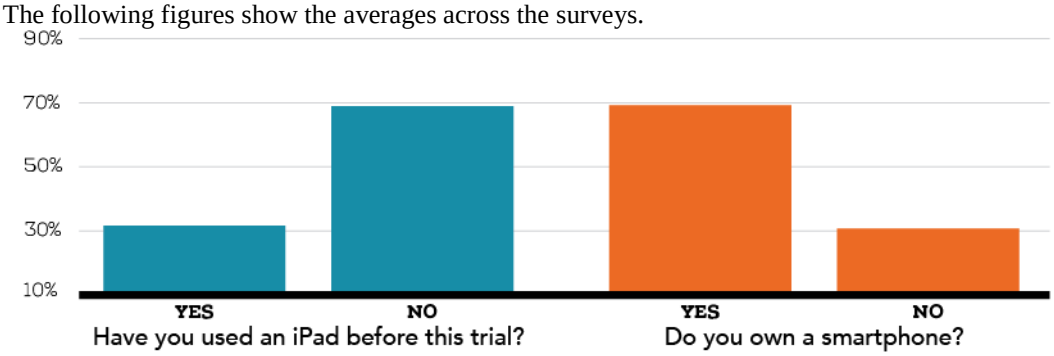

Figure 1: Previous experience with an iPad and smartphone ownership

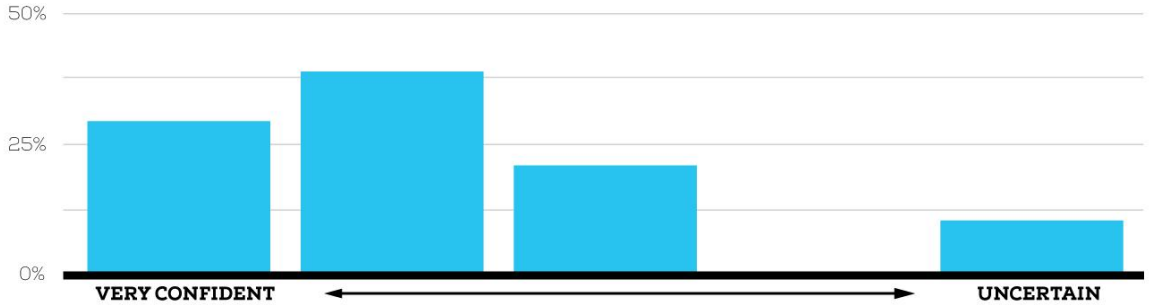

Figure 2: At the start of the trial how do you feel about using an iPad?

These surveys were also used to get a better sense of their expectations of services and content related to the LMS (*Interact*) that should be available on mobile.

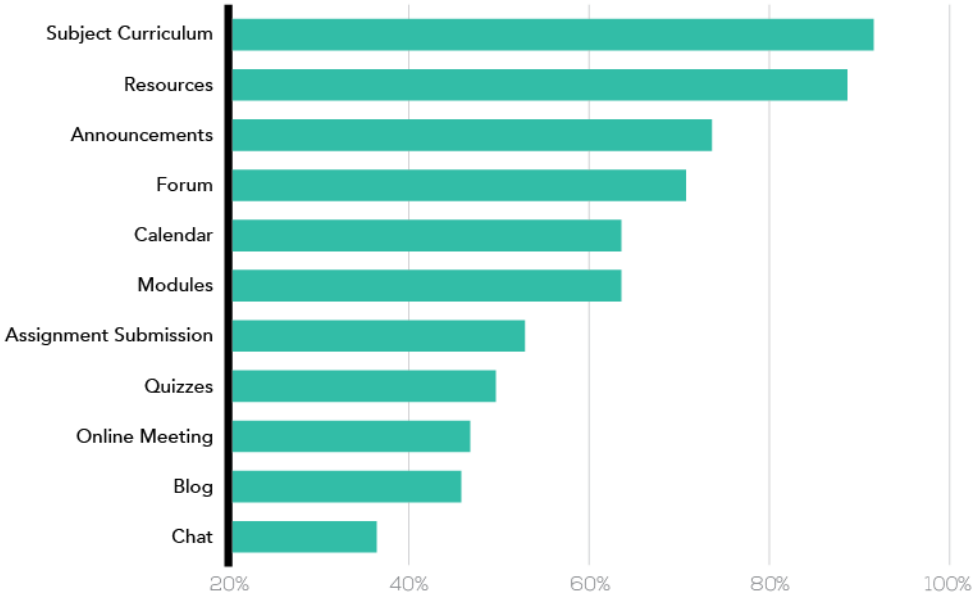

Figure 3: What tools from the LMS would you like to access on a mobile device?

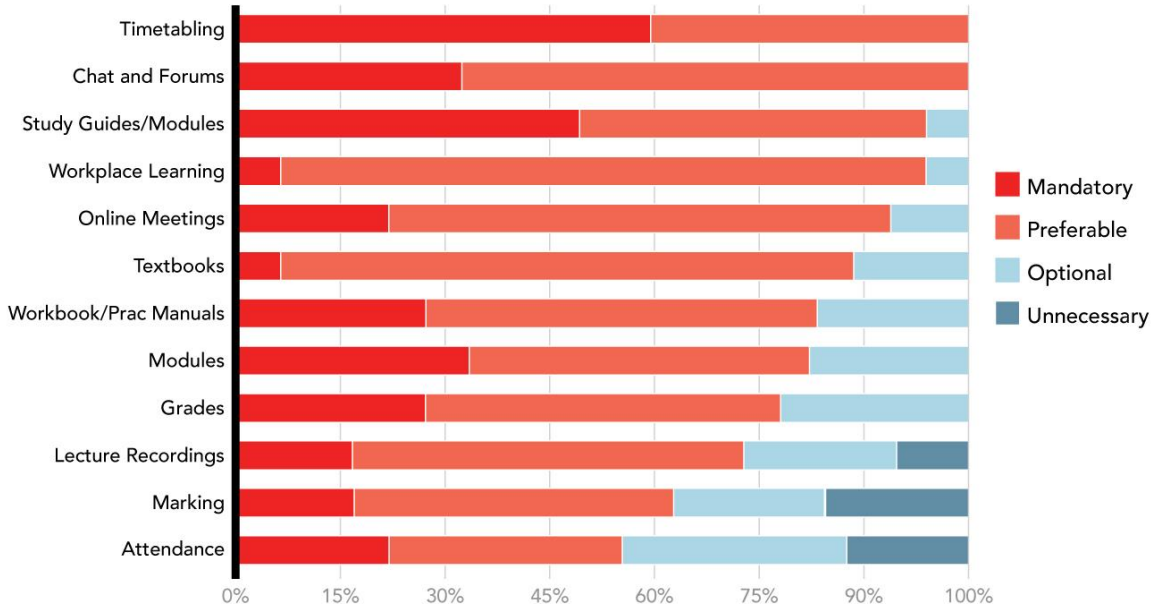

Figure 4 What aspects of learning and teaching should be available on mobile technology?

Exit Survey

The exit survey was used to measure what staff and students had done in the trials, how they had used the devices and how they viewed using the iPads. This survey have been broken up into three participant groups; Student Group 1 were part of the first set of trials, Student Group 2 who were the longitudinal group from MRS222 who conducted the exit survey after two sessions with the iPad, and the final group was made up of the staff participants. Participation was as follows:

- Student Group 1 (SG1): 13 Responses (EML309 77% & ITC594 23%) a response rate of 25%.
- Student Group 2 (SG2): 5 Responses (MRS222 100%) a response rate of 38%.
- Staff Group (STG): 9 Responses (Community Health 22%, Environmental Science 11%, Dentistry & Health Sciences 33%, Academic Support 11%, Other 22%) a response rate of 36%.

Activities on the iPad

One of the key outcomes of the surveys was to gain a better insight into how staff and students would use an iPad. Across the three groups usage can be broken into the following categories:

- **Research/Investigation** - websites, library catalogues and journals.
- **Reading** - online and digital documents.
- **Communication** - email, social media and Skype.
- **Note Taking** - in class, in the field and at home.
- **Video Consumption** - extensive use of YouTube and internal lectures
- **Video & Audio Creation** - staff and students recording themselves as part of their practice, research and learning.
- **Group Work & Sharing** - participation and collaboration around a device and content.

Students reported that they would spend more time accessing their subject outlines, Interact, other learning materials and their lecture when they had an iPad. Access to library, forums and textbooks remain unchanged. The median measurements across the groups showed that **the iPad was used 6.5 days a week for around 1.5 hours each day**.

The iPad's Effect

This section of the survey was used to gain a subjective assessment of how they felt using the iPad may have affected them. Staff and students responded that the iPad wasn't a distraction in class, a distraction in their personal space nor did it make them more focused in class. The majority of staff and students did feel though that the iPad made them feel:

- more engaged and active in class and the subject as a whole;
- it was a benefit during classes and personal time;
- more motivated for study and that they were learning better;
- and that they would recommend the iPad as a study tool.

Technology Preferences
The project trials did not conduct direct comparisons of technologies nor make it mandatory that staff or students use the prescribed technology. Instead staff and students were asked to subjectively indicate their preference from a range of technologies – smartphone, tablet, laptop, desktop and paper – to complete specific tasks and activities. Based on these responses:

- Laptops are the preferred technology to write an essay and use PebblePad (the ePortfolio tool at CSU).
- Tablets are the preference for the following activities: Write a blog/wiki, Access Interact, Access student.csu (which is the central student support website); Access staff.csu (which is the central staff support website); Read your learning materials, Take to Class, Take to Practicum, Take to Conference, Take Home and Device supplied by the University.
- Only one activity that had a preference for paper was "Read your Textbook".
- Smartphones did not receive above 5% on any task and on most was 0%.
- For writing an essay Desktops received 26% of the vote, but this was the only task they achieved above a significant minority.

Some student comments

"We used various apps to make virtual storybooks for children where you could draw your own pictures and add words, audio and voice overs. I found this really useful and ended up using it in another class for an assignment which got really good feedback."
"It was useful for bringing up websites, syllabus documents and resources, whilst typing the assignment on my laptop or iMac."
"Loved being able to relax in an armchair and do reading for uni!!! … it was also great for sharing stuff with others in an informal environment."
"Typing is slow for assignments, which I solved by connecting a wireless keyboard. Apart from that, some lecturers seemed to assume iPads were being used for things other than study in class/lectures and were perhaps not familiar with the possibilities of their use."
"I had to learn a lot of new technology and felt I spent a fair bit of time learning about the technology rather than applying myself to the subject, but that is what happens when you use new technology"

Students were asked what was the most important lesson learned:
"That everything can be much simpler! Aside from typing an essay or notes, the iPad made studying significantly easier, quicker and simpler... it changed the way we studied and it is a big transition to go back to how we were doing it before."
"How beneficial an iPad can be in class. I never really thought of an iPad as an educational tool but after using it for a semester I now realise how beneficial it was to my studies. Reading things online was the best thing and looking up the syllabus"
"That technology should not replace old methods such as using pen and paper and can be unreliable and not suited to all tasks."
"It allowed for my education to be more interactive and engaging. It was really helpful."

Discussion

This section aims to provide a meta-perspective of the trials and develop an overview of the connections and implications that the project has revealed. It is an attempt to go beyond the typical small scale and isolated studies of educational technology and place instead focus on a broader context relating to institutional operations, strategy and resourcing.

The project has made a rigorous attempt to be expansive and touch on a wide range of areas related to our institution, our staff and students to discover the issues and opportunities associated with mobile technology in learning and teaching. Mobile represents a significant opportunity for higher education as we move towards a more digital and online environment. It also presents us with many challenges and questions to explore further about whether our infrastructure, services, practice, support and role as institutions are ready for a technologically different world.

There is significant reward for Mobility

The mLearn project has attempted to find out how mobile technology can be applied to learning and teaching, but also to investigate the possible rewards for its adoption and rollout. The survey and feedback from the trials point to a number of positive outcomes:

3. **Improved Digital Literacies** - The discussions and survey data from the program demonstrates that staff and students are reporting improved confidence and knowledge working with the technology. These skills

are of increasing importance into the future, but developing these literacies further will require ongoing development and support. The introduction of mobile devices into the staff and student technology repertoire has acted as a catalyst for change and personal development providing the foundation and motivation for further exploration.

4. **Supports Current Initiatives** - Mobile technology provides a platform to support many initiatives currently underway across the sector. Student experience and satisfaction programs tend to benefit (ACU, 2011) and the technology is playing a vital role in areas such as paperless marking, recent features to the Moodle and Desire to Learn LMSs. Given the haste and effort shown by all the LMS vendors mobile is also seen as a vital component in the increasing move to online and blended modes of course delivery.
5. **Increased Engagement & Flexibility** - Students and staff have been given much greater flexibility through the technological affordances and improved opportunities for engagement in course and subject work. The devices are able to provide rich and engaging content through apps and digital publications that take advantage of the unique abilities of mobile devices, their sensors and digital affordances like 3D and interactivity. These provide significant opportunities for higher education to develop increasingly interactive, seamless and engaging teaching and learning.
6. **Enhanced Communication** - Mobile devices have demonstrated the ability to open new communication channels with staff and students across a range of social media and online tools. These have been used to improve access to staff and institutional services in the project. .
7. **Reduction in Costs** - In one of the project trials (MRS222) a significant reduction in travel expenditure was achieved through the provision of iPads because it provided a stable platform for contact while on placement. There were also significant reductions in printing attributed to more online content being accessed and the uptake of paperless marking. This has widespread implications for institutions around the world trying to reduce the costs of education for the student and the organization.

The Learning Curve

Most staff and students agreed that the setup process and learning to use an iPad was quite quick and easy and that there is no requirement for much prior learning or skills. However, while intuitive in the design, the iPad still has a significant learning curve associated with its adoption and application. There is a need to adapt not only to the new device but to learn a variety of new concepts and methods of working with this mobile technology including:

- The lack of a visible file system
- A lack of equivalent applications to what is available on laptop and desktop computers
- Cloud computing services are integral to the functionality of the device so a range of new services are required to be signed up for to maximize the effectiveness of the user
- Students are not as sophisticated as we imagined and tend not to be adventurous in their usage, preferring to remain with known approaches.
- Many participants highlighted a lack of available documentation and information around mobile devices, applications, software and usage.

This learning curve points to the need for institutions to provide more information, training and advice for existing and future users of mobile technology. This puts pressure on institutions' professional development and support capabilities. It also opens up opportunities to respond to these challenges in new and emergent ways. The mLearn Project aims to develop a website to act as a hub for this information by the end of 2013 to form a central contact and publishing point for information related to mobile technology and its relationship with learning and teaching.

An Agile Approach

A range of new issues and challenges have accompanied the project's progress and the application of an Agile process has ensured that the team has been able to adapt quickly to changes in circumstances. For example in June 2011 when the outline of the project was still being developed, 25% of the adult population of Australia had a Smartphone. By June 2012 that figure was 49% (ACMA, 2013) and our student statistics point to this being as high as 75%. Traditional project establishment and management methodology are not adequately equipped to cope with these kinds of rapid changes because when things are unexpected they tend to have negative consequences rather than positive (Den, 2013). A technology project today has to contend with extensive technological and cultural changes and as such needs to follow an agile methodology so that it can adapt and evolve to the fast-paced churn of new technologies and platforms to ensure it can not only keep up, but also remain relevant.

Technical Findings

A range of significant technical issues were uncovered during the trials. Awareness of these could assist other universities and highlight areas that may need more investigation, investment and development.

- The CSU WiFi network uses the EAP encryption method that is incompatible with some devices, in particular, eReaders and older mobile devices. This kind of technical limitation can affect the student experience and may also render some devices unusable and redundant.
- The lithium batteries used in mobile devices are considered to be dangerous goods, and cannot be transported by air. For institutions looking at distant and blended education students or remote staff this may have significant impacts. This extends not just to the provision or supply of devices but lending services, through the library for example.
- Licensing limitations around the Apple ID, required to use iPads, affected the planned rollout strategy for loaning devices in the project. These kinds of licensing stipulations can impact the ability for institutions to deliver solutions and force significant compromise and change.
- Many components of the CSU online experience are not mobile friendly and use legacy technology or those incompatible with many mobile devices, in particular Java and Flash. Transitioning systems and learning resources at scale requires significant investment and resourcing. For a project these issues can be compounded by the inability to provide support remotely or scope to resolve systemic issues.
- iPads are extremely robust, the build quality is excellent and no devices failed during the trials. This removed the project's requirements for ongoing support, replacement and spare devices. The value of build quality, look-and-feel, attention to detail and the user experience is often difficult to quantify compared to values like specifications and price. Yet these values play an extremely important component in the overall satisfaction, support and usage of the technology, which can impact a project in many ways, particularly where energy, time and money need to be spent. The value of quality should play an important part in the evaluation of new and innovative technology as it can have significant repercussions in overall cost.

Summary and recommendations

One of the outcomes for the project has been the development of recommendations to be fed back to the university to help imagine and develop the role of mobile technology into the future and have broad applicability to the higher education sector. The project has focused on five key areas.

Provisioning of iPads to Staff

The provisioning of iPad devices to all academic and support staff should be given consideration as part of an accelerator program to increase digital literacy and support other university initiatives. Supplying iPads can underpin the uptake of current initiatives such as increased online content, paperless marking, a reduction in print and innovation in assessment. There is also the benefit of increasing blended and flexible working options. The ubiquity and equity created by this kind of initiative would provide a platform from which further innovation in an institution could occur through app development, cloud services, digital resources and communities of practice.

Provisioning of iPads to Students

The Project cannot endorse a 1:1 rollout across the board to students due to the concerns over sustainability, suitability and the increased preference for Bring Your Own Device solutions. However, there should be scope to develop a full range of provisioning options to assist students access the technology. Some large-scale funded rollouts across specific discipline areas would be useful where they can demonstrate a return on investment, provide significant benefits over existing technology and practices or improve equity and access to the university.

Support and Training

Investment in establishing support staff and training resources for mobile technology at a university level is required as currently there is only limited support from systems and staff. While mobile technology is considered intuitive, it is certainly not free from training and ongoing support requirements and capabilities within the institution need to be developed.

Adaptive Digital Publishing

Learning resources and content fit for purpose on mobile devices is still scant within the institution. Further investigation and development is required to establish a platform-neutral publishing standard that would provide universities with future-friendly content that is flexible and interoperable. These standards will assist in the reduction of content silos and enable the provisioning of learning resources across multiple platforms, devices and publishing points (print, eBook, Web, App) and across an ecosystem of devices.

Internal Cloud Services

Mobile computing relies on the Cloud and investment is needed to rollout enterprise cloud services that can be

integrated with a variety of device applications and used across multiple platforms. Investment in a managed Cloud Storage and Services infrastructure would ensure a safe and secure system and a platform for future development.

Areas and Opportunities for Further Research

The project has also highlighted a number of possibilities for further research. These would include:

- The use of mobile as creation tool. This could have significant impact on assessment and new opportunities to leverage the affordance of mobile devices.
- Mobile as a shared resource in the classroom. This would entail using apps as learning resources and be particularly useful in a collaborative environment.
- The mLearn Project team in close cooperation with other sections in the Division of Student Learning is developing a functional proof of concept of Adaptive Digital Publishing due at the end of 2013.

Conclusion

The methodology employed by the project has provided an excellent model for introducing and trialing new technology. The project has been able to conduct a variety of trials across different faculties, disciplines, locations, applications, staff and student cohorts. Conducting real world trials on a small scale has proved easier to support and the team has been able to respond quickly to issues, significantly reducing their impact. The trials have provided us with many lessons as to what works and what does not within our current situation and because they have been conducted in situ - with our students, the current technology and infrastructure - they have provided insight and a better understanding our present environment and capabilities. This has allowed us to develop and contribute to a much more vivid vision of the future.

Mobile is now the New Normal that can no longer be considered an add-on or a nice-to-have; it is the standard technology that more people right around the world have access to than any technology before it - including cars, radio and television (Ahonen, 2011). Mobile is changing technology (Evans, 2013) and represents the dawn of a new normal that is a user-centric ecosystem that encompasses multiple devices - tablets, phones, laptops and desktops. An ecosystem where mobile devices increasingly represent the primary device because it is compact and affordable. We are already living, working and learning across multiple devices and mobile represents just the first wave of embedded and contextual technology. Higher education is entering a stage where we need to change how we think about technology, less about single solutions, more about operating in ecosystems. There is no single device, no single app, and no single service that can provide ***the*** solution because the new normal is inclusive rather than exclusive, complex rather than simple, and expansive not restrictive.

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