

Developing a framework for evaluating the impact and sustainability of mobile learning initiatives in higher education

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Abstract

The potential of mobile technologies to enhance the learning experience for students has been recognised by researchers and educators. Few learning institutions, however, have moved beyond piloting and developmental studies and embedded well-financed and highly visible mobile learning strategies into everyday learning and teaching practices. The aim of this project is to develop a comprehensive framework for evaluating the impact and sustainability of mobile learning initiatives within Higher Education.

Keywords: m-learning, mobile learning, evaluation, maturity model, framework

Introduction

Higher education stands on the edge of a great precipice of change – change brought about by mobile technology (Engel, Palloff & Pratt, 2011)

As the m-learning field is still in its infancy, there are few guidelines and examples of best practice available to ensure the sustainability and transferability of m-learning initiatives. A significant challenge facing most HE institutions is identifying strategic and operational priorities for investment in m-learning capabilities within a rapidly changing field, while maximising the educational outcomes for students and minimising institutional costs. This paper is about a project to develop a framework for mobile learning or m-learning that will enable Higher Education (HE) institutions, learning designers and educators to evaluate the impact and sustainability of m-learning initiatives within a range of learning contexts. The m-learning evaluation framework (MLEF) will be developed to facilitate and support HE institutions in the assessment, development and embedding of m-learning policies and/or practices to enhance the learning experiences of students and support long-term planning for improved learner and institutional outcomes. The framework will be independent of specific technologies and therefore will remain relevant despite the emergence of new devices.

Background

Over the past ten years, a number of pilot or experimental research studies have been conducted across sectors to investigate the impact of mobile technologies on learning and teaching (e.g. Elias, 2011; Biggs & Justice, 2011; Wong, 2012). One of the most consistent conclusions of these studies is that there are still a number of barriers that influence the adoption of m-learning initiatives in education, both at an institutional and at a user level. HE institutions are cautious about investing extensively in mobile technologies because of the rate of emergence of new models and the speed with which devices become obsolete. Few HE institutions have therefore implemented well-financed and highly visible m-learning initiatives that are operationalized within policy and practice.

A report conducted for the JISC e-Learning programme in late 2010 indicated that the most prominent issue in the field of m-learning is the lack of full scale evaluations of mobile technology in Higher Education (Wishart & Green, 2010) and the absence of a stable platform from which to effectively research the role, drivers and impact of mobility on learning (Park, 2011). Several attempts to conceptualize mobile learning have been made (e.g., Traxler, 2007; JISC InfoNet, 2011; Pachman, Logunov, & Quinton, 2011; Vavoula & Sharples, 2009), yet none have been sufficiently targeted to ensure comprehensive and rigorous coverage of the rapidly developing and changing landscape of contemporary m-learning networks and technologies. This project will address this gap by developing an effective assessment mechanism that can be used to evaluate whether m-learning initiatives are successful, scalable and replicable. This project will result in three significant outcomes:

- (1) A standardised model and mapping tools to explore how m-learning initiatives impact on learning and teaching in higher education;
- (2) A review and analysis of the broad spectrum of pilot studies and initiatives that have been implemented in Australia and elsewhere, and the kinds of approaches used to evaluate them; and
- (3) A Mobile Learning Evaluation toolkit: a set of principles, procedures and methods that can be used to promote the collection and review of information related to new mobile technologies, the objective evaluation of m-learning initiatives, and prioritisation of proposed investments in m-learning within various learning contexts.

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Project approach

The aim of this project is to build an evaluation model that is sufficiently flexible to accommodate the current and future needs of students and educators for m-learning initiatives. For this reason an iterative approach will be used to ensure that each commencing stage is built from the insights obtained in the previous stage and allow the inclusion of new insights and innovations in the field as the research project matures. Participatory monitoring and evaluation (PM&E) methods will be used as the project involves the development of artefacts, such as a Mobile Learning Evaluation toolkit, which are aimed at being responsive and relevant to the needs of the education community. PM&E has emerged from the extension of participatory action research (PAR) into evaluation (Lennie, 2006) and is a holistic approach that accounts for the diverse perceptions and interpretations of participants as well as actively and collaboratively engages participants across all levels of the project (Estrella, 2000). The method is based on the principles of PAR which allows for context-specific cycles of action, data collection and analysis, reflection and re-integration of findings and ideas (Walter, 2009). The use of these methods will ensure that the outcomes of the project are relevant within real-world contexts.

A systematic review will be conducted which will identify and appraise all high quality research evidence related to cross-disciplinary m-learning initiatives in higher education. An additional review of the methods developed and used so far to evaluate the impact of m-learning as well as broader ICTs on teaching and learning will be conducted, with an emphasis on the strengths and inefficiencies of each of the different approaches and the gathering of resources to be included within the toolkit. During this stage a comprehensive definition of m-learning will be developed and potential m-learning pilot studies or exemplars will be identified for further examination.

The project will be undertaken over a period of two years and consists of the following three stages:

Stage 1: Development of the m-learning evaluation criteria

The focus of the first stage of the project will be on developing the preliminary evaluation criteria and framework. Quinton and colleagues (2010) recommend that a three layered approach: pedagogical, technical and organisational, needs to be adopted when evaluating the impact of ICT initiatives on teaching and learning to ensure the sustainability of any learning technology. This approach will be adapted for the first stage of the project. The following groups that represent each layer will be consulted during this stage to identify the needs, expectations and challenges of each level when considering the implementation of m-learning initiatives:

Level	Description	Method	Sample size
Organisational	Senior level management at the partner institutions and HEIs globally who have conducted pilot studies or implemented institution wide m-learning initiatives.	Recorded online or telephonic interviews	5-10
Technical	ICT or learning systems support representatives responsible for technical infrastructure, standards and protocols at each of these institutions.	Recorded online or telephonic interviews	5-10
Pedagogical – Teaching	Educators from different HE institutions and disciplines globally who have attempted to pilot m-learning initiatives.	Online discussion boards or interviews	20-25
Pedagogical – Learning	Students at each of the three partner institutions who are interested in m-learning who will be able to contribute input on needs and preferences.	Focus groups and social media surveys	60-75 (20-25 at each institution)

This stage of the study is exploratory and will focus on the following objective at each level:

- **Organisational:** Clarification of the institutional policies and practices that currently support or hinder the implementation of m-learning initiatives and the criteria required by each institution for the functionality and features of the ideal initiatives.
- **Technical:** Identification of the current infrastructure assets and challenges as well as standards and protocols that will impact on the success of mobile learning initiatives.
- **Pedagogical (teaching):** Reflection on the strengths and inefficiencies of current m-learning practices as well as the barriers and critical success factors that impact on the adoption of m-learning initiatives.
- **Pedagogical (learning):** Exploration of the current definition and expectations of mobile learning and insight into current formal or informal mobile learning practices to identify gaps in current services and student learning needs.

Potential participants will be identified and approached during the review stage that forms part of the project. As the principles of participatory action research form an integral part of the project, participants at all levels will be requested to continue participating in the project as a review panel to comment on research findings and deliverables. Established social media channels and

project blog will be the channels that are used to facilitate this interaction. The majority of interviews will be conducted using online collaboration software such as Blackboard Collaborate. Interested members of the m-learning community will be invited to attend the interview and ask questions. The interviews will be recorded edited into mini-webinars and made available on the project website. NVivo will be used to support analysis of the data collected from these interviews.

The first iteration of the online Mobile Learning Evaluation toolkit will be developed during this stage which will include m-learning exemplars and best practice resources collected during the review. These resources will be presented in the form of case studies as well as examples of evaluation methods. The online toolkit will be the central point from which the dissemination of project activities will occur. The project team will adopt some of the creative and highly effective online and social media dissemination strategies developed by the ALTC Learning to Teach Online project (McIntyre & Watson, 2011) such as the consistent use of dedicated social media channels to engage the education community around the world. The website used to host the toolkit as well as the project blog, dedicated social media sites and RSS technology will be used to communicate the concept, relevance and need for the project as well as solicit information and encourage the development of an m-learning online community. Media interviews will also be conducted about the aims and relevance of the project.

Stage 2: Validation of evaluation criteria and development of models and frameworks

The second stage of the project involves the confirmation of the evaluation criteria and development of the models and frameworks. In order to ensure that the evaluation criteria, m-learning maturity model and user models are reliable and representative of the Australian HE population, a large scale survey research study will be conducted. The following sample sizes and populations will be targeted

Level	Description	Method	Sample size
Organisational	Senior level management at regional or metropolitan Australian HEIs.	Online survey	20-25
Technical	ICT or learning systems support representatives at regional or metropolitan Australian HEIs.	Online survey	20-25

Pedagogical – Teaching	Educators at regional or metropolitan Australian HEIs, across various disciplines, who are interested in m-learning.	Online survey, discussion forums, polls	100-150
Pedagogical – Learning	Students from regional or metropolitan Australian HEIs.	Online survey, discussion forums	1000-2000

Four survey instruments will be developed that are customised for each of the levels. The item pool for the surveys will be drawn from the data collected during the first stage of the study and will measure several components such as institutional context, adoption drivers and barriers, user expectations and needs, pedagogical criteria and learning styles, and impact of m-learning initiatives. The draft instruments will be sent to the initial participants as well as a panel of experts including the reference group for formal review. The initial form of the instrument will be piloted on a sample of students and educators at one of the partner universities. The pilot survey data will be analysed using SPSS and the results will be used to refine the instruments and develop the preliminary maturity and user models. The data obtained from participants completing the final surveys will be used to calculate reliability and validity of the instruments, validate the models using techniques such as structural equation modelling (SEM), and obtain the normative data. The data will also be analysed in order to segment and profile the differences in m-learning by students and educators across various regions, demographics, age-groups, and study fields.

Stage 3: Finalisation of the Mobile Learning Evaluation Toolkit

During the third stage of the study the finalised Mobile Learning Evaluation toolkit and resources will be made available on the online website to be accessed freely by the education community. Responses and critical feedback to the final deliverables will be actively sourced during this stage. The toolkit will also act as a resource for the community that will enable the identification of m-learning initiatives that have been demonstrated in pilot and experimental studies to contribute to high quality learning experiences and which can be re-used and adapted across learning contexts.

Conclusion

As mobile technologies have evolved and become more capable of supporting learning experiences in both blended and stand-alone contexts, the field of m-learning has emerged as a new learning paradigm and become a focus of research and development activities (Kukulsk-Hulme et al., 2011; Engel et al., 2011). The near ubiquitous access enabled by the connectivity of mobile technologies has attracted the attention of educators because of the potential to open new avenues of communication, disrupt traditional classroom boundaries and “create and sustain communities of learners” (Garrison, 2011, p.1). Mobile technologies allow a user to learn anywhere, anytime and are therefore a tool which may bridge life-wide and lifelong learning (Beddall-Hill & Raper, 2010). As high speed broadband, supported by the development of the National Broadband Network (NBN) becomes more widely available, training and educational services will migrate from face-to-face and traditional distance education models to mobile paradigms. This will improve the capacity of educators to reach remote learners and workers in the field.

This paper describes a project about to undertaken by researchers at the University of Southern Queensland, the Australian national University and the University of South Australia to develop a Mobile Learning Evaluation Framework that will aid in the selection and justification of m-learning initiatives. The framework will be encapsulated in an easy to use online Mobile Learning Evaluation toolkit which will consist of: a standardised evaluation framework, resources and guidelines; an m-learning maturity model; a database of m-learning exemplars; and an interactive mobile user model. The project is a collaborative initiative between USQ, ANU and UniSA. Participatory monitoring and evaluation (PM&E) methods will be used to develop outcomes and deliverables.

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