



Revisiting the definition of Mobile Learning

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Mobile learning is increasingly seen as a boon to universities and educators as a means of enabling learning anywhere, anytime and at the convenience of the learner. Even though the field of mobile learning is in its infancy, there is no common understanding of what mobile learning is. Previous attempts at defining mobile learner have either been overly inclusive or exclusive, and have focused on characteristics of the mediating technology, the learner, or the nature of the learning activity. Inspired by Wittgenstein's theory of family resemblances, this paper explores the attempt to create a new definition of mobile learning that will be dynamic, drawing from a collection of characteristics that may change over time rather than just supplying a single, unchanging definition. The revised definition will be used to support the development of a Mobile Learning Evaluation Framework by clarifying the attributes and features to be included in a robust and flexible definition of mobile learning. The outcome may be of value to researchers in the mobile learning field and educators considering incorporating mobile learning initiatives into current pedagogical strategies.

Keywords: mobile learning, m-learning, smart mobile technologies, mobile learning definition, Delphi technique

Introduction

Since the first brick-like mobile phones appeared on the market in the 1990s, mobile computing technologies have developed briskly, facilitating increasingly sophisticated ways of interacting and communicating. As a result of the incremental improvements in design, tendency towards reduced size, increased functionality, improvements in data storage capability, and the reliability and ubiquity of the networks that support them, mobile technologies have become essential to the conduct of people's everyday lives (Evans-Cowley, 2010). In the educational context, ubiquitous connectivity and the portable nature of these devices facilitates access to collaborative and contextualised learning experiences which translate into greater ownership of learning processes (Wong, 2012). Furthermore, these technologies are becoming ever more affordable, presenting unique opportunities for facilitating the flexible delivery of contextualised learning experiences for diverse student cohorts.

The field of mobile learning is relentlessly advancing and new research studies that explore the affordances of mobile technologies in learning environments unfold on a regular basis. Nevertheless, researchers are still struggling to develop a consensual definition of mobile learning that is sufficiently distinct from e-learning (Traxler, 2010) in terms that are educationally relevant (Guy, 2010). Traxler (2007) emphasised that the characteristics of mobile learning contribute to the difficulties in developing a definition. He identified three

characteristics: personal, contextual and situated, that contribute to the 'noisiness' of the term. Furthermore, he cautions that the inherent informality associated with mobile learning may place the definition at odds with formal education structures and processes. These are some of the challenges faced by those attempting to conceptualise a definition of mobile learning that suitably encapsulates the unique affordances and potential value of mobile learning within formal education environments.

In late 2012, a team of 13 multidisciplinary researchers from the University of Southern Queensland, the University of South Australia and the Australian National University embarked on a three year project to develop a Mobile Learning Evaluation Framework (MLEF) (see Murphy & Farley, 2012). The first step in this journey required clarification of the precise meaning of the term 'mobile learning'. Each of the team members were in their own way struggling with their personal meanings of mobile learning and had found evidence in their own interactions with fellow educators that the meaning of mobile learning was contested. As a consequence of this disparity in understanding, educators appeared to be unsure of role and value of mobile learning within existing teaching models and how to effectively utilise mobile technologies to support student engagement. The team decided to embark on a research study using a staged approach to review definition frameworks of mobile learning currently available in the literature and explore the possibility of developing a new structure. The revised definition of mobile learning will support the foundations of a larger project to develop a Mobile Learning Evaluation Framework as the project team will have greater clarity about the breadth of technologies and functions that can be understood to describe the nature of mobile learning. The revised structure will also permit identification of components that are currently missing from existing definitions of mobile learning, thereby supporting further research and development within the field. This paper provides a short overview of the methodology adopted to achieve this aim and a glimpse into the findings from the first phase of the project.

Previous attempts to classify definitions of mobile learning

There have been several attempts to classify the definitions of mobile learning used in the literature into a comprehensive framework. John Traxler (2010), Professor of Mobile Learning at Wolverhampton University, identified that three categories of mobile learning have been used in past literature. He identified that early approaches to defining mobile learning tended to focus on the nature of mobile devices, referring particularly to handheld or palmtop electronic devices. The next generation of definitions exhibited a greater focus on mobility, but was largely still directed towards the mobility of the technology. The third category moved away from considerations of the technology to emphasize the mobility of the learner and the learning process. Those definitions which incorporate a description of the technology are in danger of becoming obsolete as mobile technologies and the capabilities of these technologies are changing at a rapid rate.

Sharples and colleagues (2005) emphasised that most theories of learning are based on the assumption that learning occurs in a fixed environment, paying scant attention to the mobility of learners. Their definition was purported to be distinct from previous definitions and theories of mobile learning because they focused on the continuous movement of the learner. Instead of learning being placed linearly along a set curriculum, they considered it to occur across five moving facets of the learner's environment:

1. Learning between various locations, though not necessarily while moving or on transport;
2. Learning across space as ideas and resources are moved between and across contexts;
3. Learning across time by revisiting knowledge obtained from previous learning;
4. Learning between topics as learners move continuously between competing priorities and topics of interest; and
5. With or without engagement with technology for example moving in and out of network coverage.

Sharples' theory highlights the fact that learning has changed, with specific emphasis on the mobility of learning. Traxler (2007) additionally suggested that mobile learning may not in fact be about learning or mobility however may be about the mobile conception of society. This again highlights the requirements of a mobile learning definition that is able to accommodate changing technologies, the way we are able to use these technologies and the societal changes and expectations that will drive the two.

Advances towards an operational definition of mobile learning will only be achieved if there is sufficient understanding of the characteristics and affordances attributed to the term. Ludwig Wittgenstein proposed his theory of family resemblances to explain the development of the extension of concepts over time. He espoused

the idea that certain classes of referents could not be specified by a determinate property, but instead proposed that possession of a group of properties could indicate that something should probably belong in a certain class. He used the analogy of a family possessing certain characteristics of appearance as an indication of their relationship to one another (Wittgenstein, 1968). This theory can be readily extrapolated to encompass mobile learning. As educators, we think we know what mobile learning is. If we see an educational activity, in most cases we are able to determine if it is an example of mobile learning or not. There are certain terms and conditions we associate with mobile learning, yet every instance of mobile learning does not possess each and every one of these characteristics. Definitions of mobile learning get bogged down when they attempt to be inclusive enough to accommodate mobile learning in all of its variety, including a wide variety of technologies, many not yet invented, but exclusive enough to differentiate mobile learning from e-learning or informal learning for example.

Methodology and preliminary findings

In an attempt to overcome these challenges, the project team are developing a new way of defining mobile learning. This new definition will be dynamic, drawing from a collection of characteristics that may change over time rather than just supplying a single, unchanging definition. A staged approach was designed and is currently underway. It includes a comprehensive review of the literature, surveys, team workshops and a Delphi survey that will form the foundation of this research. The following section briefly outlines each stage of the approach as well as discusses preliminary findings from the research stages that have already been completed.

Preliminary survey to define mobile learning

The project to develop a Mobile Learning Evaluation Framework commenced formally in October 2012. Soon after, a short survey was developed to facilitate awareness of the project among the education research community and encourage engagement with potential stakeholders. This survey formed the first stage of the journey towards understanding how educators and researchers conceptualised mobile learning and how these ideas aligned with the existing research literature. A link to the survey was made available on the project website as well as through Quick Response Codes (QR) that were printed on postcards. The postcards were handed out at the formal launch of the Collaborative Research Network (CRN) project at the University of Southern Queensland and the 2012 ascilite conference in Wellington, New Zealand, both held in November 2012.

Approximately 100 postcards were handed out at these events and responses from 26 participants were received. The majority completed the poll using their mobile devices (14, 54 per cent) of which nine used an iOS operating system (OS), one an Android OS and another a Windows OS. Laptop computers were used by seven respondents (27 per cent), three used Apple iPads (12 per cent) and 12 used desktop computers. Each respondent was simply asked to state how they would define mobile learning. Although only a few responses were received to this short answer question, the themes that arose from the proffered definitions reflected the lack of consistency in defining mobile learning as well as some concern about the value of the term. Unsurprisingly, these definitions were rather exclusive and focused on the types of technology or style of learning activity. This provided some food for thought for the project team and a workshop was planned to try and make sense of some of the issues around defining mobile learning.

Project team workshop

The exchange of information, meaning and dialogue has been identified as one of the central features of effective team practice (Ovretveit, 1996). Two workshops were held with project team members to identify the personal assumptions and beliefs about mobile learning. The team members on the MLEF project originate from a range of disciplines including the sciences, humanities, business, education, mathematics and computing. The outcomes of these discussions were considered to be a first step towards the development of a multi-disciplinary definition of mobile learning. The first meeting consisted of a half-day workshop during which team members collaboratively identified 31 characteristics or attributes of mobile learning. These attributes were placed on a continuum from ideal to imperfect mobile learning conditions. A list of the characteristics identified can be seen in Figure 1.

A second workshop was held a few weeks later to further categorise these attributes into family groups. Eight family groups were identified. The next step in this process is to compare the attributes and family groups identified by the team members to existing literature studies and determine points of difference.

Delphi technique

The workshop findings will be complemented by the results of a Delphi investigation. The use of formal consensus techniques have previously been found to be helpful with definition development in situations where no gold standard exists, potentially reducing bias and resulting in a definition with improved characteristics (Ferguson, Davis, Slutsky & Stewart, 2005). The Delphi technique is an iterative process where experts are polled individually with a series of questionnaires, receiving anonymous group feedback between iterations, to develop a formal definition of mobile learning. The Delphi technique was chosen because of its ability to overcome geographic constraints, low costs and ability to ensure all panellists have an equal voice in the proceedings (Riggs, 1983).

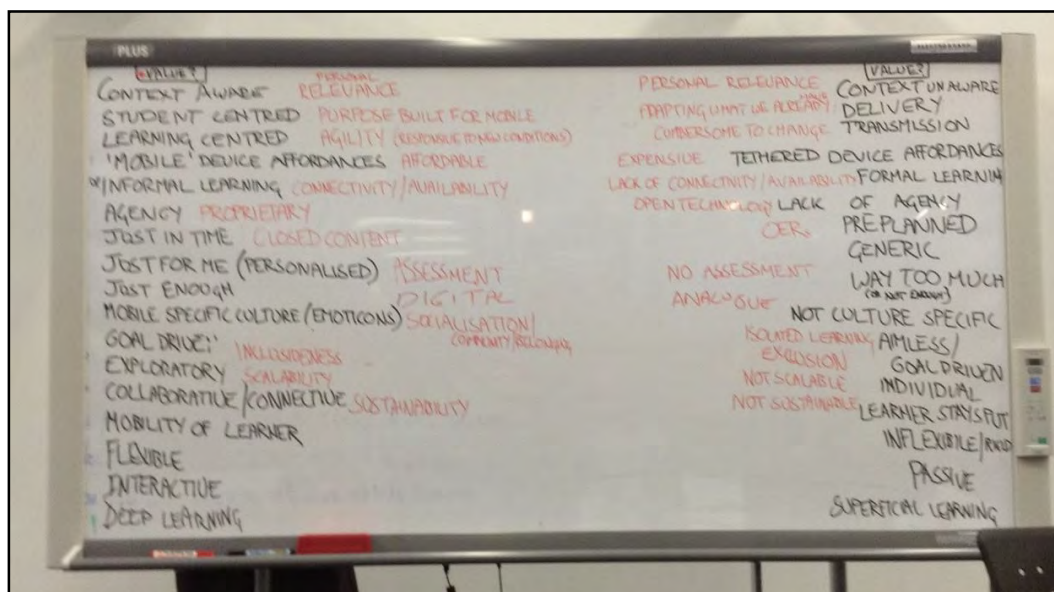


Figure 1: List of characteristics identified by the project team in Workshop 1.

The process consists of a three-stage panel survey with researchers, educators and theorists who have published in the field of mobile learning between 2005 and 2013. The first phase was conducted between February and May 2013. The survey consisted of two open questions and eight demographic questions. In the first question participants were asked to list all possible extrinsic or intrinsic characteristics that should be included in the definition of mobile learning. For the second question, participants were asked to create an operational definition or clear example of each of the characteristics they mentioned in order to provide adequate context for each definition. Email invitations were sent to 49 researchers identified through the literature review, as well as to a number of online mobile learning groups. Those who wished to participate in the survey contacted the research team and were sent a personalised link to the survey to enable the research team to track responses and ensure that participants met the publication criteria. Responses from 30 participants were received.

Next steps: building and testing the new definition framework

The next step in the research process involves consolidating the attributes identified in the short survey, team workshops, first phase of the Delphi study and relevant attributes from a review of the literature into a series of categories. These categories and attributes will be submitted to researchers in the mobile learning community, including participants from the first phase of the Delphi study, to determine whether they agree or disagree with the team's selection of the categories for the attributes, the distribution of the attributes across the categories and for any additional insights. The final stage will involve consolidating the revised attributes and categories and presenting a revised definition to participants for final comment. Only participants who have been involved in the second phase of the Delphi study will be permitted to participate in the final stage. Participants will be provided with the opportunity to agree or disagree with the final definition, submit additional comments or provide a rationale for disagreement.

Conclusion

Current definitions of mobile learning tend to be overly inclusive, in that just about any e-learning activity can be classified as an example of mobile learning, or overly exclusive through only allowing the inclusion of learning activities mediated through very particular mobile devices. With the emergence of innovative mobile technologies with new affordances, emerging pedagogies to accommodate new modes of learning, and an increasing demand for learning anytime and anywhere at the convenience of the learner, the demand for a dynamic definition of mobile learning is acute. The authors are part of a project team developing a Mobile Learning Evaluation Framework. Inspired by Wittgenstein's theory of family resemblances, they are also working on a new definition of mobile learning that is dynamic and drawing from a collection of characteristics that may change over time rather than just supplying a single, unchanging definition. This paper outlines the process which the project team is undertaking to arrive at such a definition.

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