



MLearning: pedagogical, technical and organisational hypes and realities

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97

Paul B. Muyinda

*Department of Distance Education, Institute of Adult and Continuing Education,
Makerere University, Kampala, Uganda, and
Department of Information Systems, Faculty of Computing and IT,
Makerere University, Kampala, Uganda*

Abstract

Purpose – There are two purposes to this article. First, to explore the hypes and realities around theoretical, technical and organisational aspects of the fast evolving field of MLearning as a complementary paradigm to online and classroom learning. Second, to review challenges and the future of MLearning.

Design/methodology/approach – The paper reviews literature related to: the mobile phone and learning with a view of bringing out its capabilities and capacities for use in learning; theories and pedagogies of learning with the view of imbuing them for MLearning; applications; and challenges of MLearning with a view of gauging its acceptability.

Findings – The development of successful MLearning solutions requires a better understanding of its pedagogical, technical and organizational setting in order to contextualise it for learner-centeredness. Literature reveals that MLearning is taking root in all aspects of learning.

Practical implications – It is not only the rapid developments in mobile device technologies that will propel MLearning to maturity. Similar developments should take place in its theoretical, pedagogical and philosophical underpinnings.

Originality/value – This paper integrates different theoretical, technical and organizational requirements for understanding hypes and realities surrounding MLearning.

Keywords E-learning, Learning, Communication technologies, Wireless, Mobile communication systems

Paper type General review

Introduction

Mobile Learning commonly referred to as, MLearning, is a form of e-learning that specifically employs wireless communications devices to deliver content and learning support (Brown, 2005). Most existing typical e-learning systems are tailored toward PC-based web access and are not customized to be used through mobile devices (Woukeu *et al.*, 2005; Goh and Kinshuk, 2006). Mobile learning has emerged as an educational application from advances in mobile computing and handheld devices (phones, smart phones, PDAs or laptops), intelligent user interfaces, context modelling, wireless communications and networking technologies (WI-FI, Blue Tooth, GPS, GSM, GPRS, 3G) (Sharples, 2000; Knowledge Anywhere, 2002).

The field of MLearning is in its infancy and is attracting considerable research (Woukeu *et al.*, 2005). As is expected of any young field, MLearning's theoretical and philosophical underpinnings have not matured. Mitchell (2000) observes that young fields are eclectic in nature, not yet clearly defined and scoped and research endeavours



in them are normally criticized for being too anecdotal, lacking theoretical underpinning. As an evolving research area, many issues in MLearning have not yet been exhaustively covered (Goh and Kinshuk, 2006). Therefore, rigorous research methodologies are needed to ensure valid and meaningful findings. Conole (2004) has identified pedagogical, technical and organizational aspects as major issues to take cognisance of before understanding any learning technology. Indeed, Goh and Kinshuk (2006) as well have called for further research in pedagogical practices generated from simple wireless and mobile technologies. This is a clear indication that the theoretical and philosophical underpinnings of MLearning have not stabilized. This paper therefore reviews the theoretical/pedagogical, technical and organizational hypes and realities surrounding MLearning.

The mobile phone and learning

The mobile phone has found a place as permanent companion of the poor and the rich. It is no longer a device for showing off one's prowess in terms of his/her richness. It is a necessary device of life. Estimates put the number of mobile phones in the World at 1.5 billion (Prensky, 2004), a number considered to be three times the number of PCs. Not only has the number grown but the processing power of current sophisticated phones has been compared to that of mid-1990 PCs (Attewell, 2005). Just as the processing power and capabilities for PCs is growing, that for mobile phones is also growing. Thus, the range of application for mobile phones is also expected to grow. One recent addition is in the area of learning. The other usual applications have been in the areas of communications, banking and entertainment (Keegan, 2005).

Mobile phones are varied in size, design and model. The varied designs are meant to cater for varied customer tastes. Attewell (2005, p. 2) confirms thus:

The modern mobile phone market caters for a wide variety of customer tastes and lifestyles. Some phones are tiny and discrete, some are chosen for their appearance (like a fashion accessory, with alternative covers that allow that appearance to be changed to match the owner's outfit), some just offer basic functionality while some others provide a wide range of business and leisure services to their users. Manufacturers are marketing diverse product ranges, including devices that specialize in providing particular services or are aimed at particular users. Instead of describing a product as a mobile phone, manufacturers often use descriptions like "game deck", "communicator" or "mobile multimedia machine".

This implies that applications designed for use on mobile phones must take cognisance of user preferences. In teaching and learning, the application should conceptualise the learner (Conole, 2004).

Theoretical perspectives in MLearning

Literature indicates lack of MLearning theories, but grounds are being prepared for their development. Sharples *et al.* (2005) have suggested four pre-requisites for the formulation of an MLearning theory. The first pre-requisite requires one to distinguish between what is special about MLearning *vis-à-vis* other types of learning. The second pre-requisite is to determine the amount of learning that occurs outside the classroom with a view of MLearning embracing it. Vavoula (2005) in a study of everyday adult learning discovered that the majority (51 percent) of learning episodes took place at home or at place of work – learners usual environment, 21 percent – outside the office, 5 percent – outdoors, 2 percent – in friend's home, 6 percent – place of leisure,

14 percent – places of worship, the doctor’s room, cafes, hobby stores and cars. Only 1 percent occurred on transport. The learning occurring on transport suggests that MLearning is not necessarily associated with physical movements. The third pre-requisite is the need to bear in mind the contemporary accounts of practice such as learner centeredness, knowledge centeredness, assessment centeredness and community centeredness. The fourth pre-requisite is that an MLearning theory must take account of the ubiquitous use of personal and shared technology. This negates Keough’s (2005) pessimism about the working of MLearning arising from its association with the ever changing mobile technology.

Sharples *et al.* (2005) enlist questions to provide a criterion against which an MLearning theory could be tested. Is it significantly different from current theories of classroom, workplace or lifelong learning? Does it account for mobility of learners? Does it theorize learning as a constructive and social process? Does it analyse learning as a personal and situated activity mediated by technology? A clear distinction between classroom and mobile learning ought to be drawn. Vavoula (2005) reports that the MobiLearn European project while reflecting on formulating a theory for MLearning identified that: it is the learner who is mobile rather than the technology, learning is interwoven with other activities as part of everyday life, learning can generate as well as satisfy goals, the control and management of learning can be distributed, context is constructed by learners through interaction, MLearning can both complement and conflict with formal education, and that MLearning raises deep ethical issues of privacy and ownership.

In absence of concrete theoretical underpinnings for MLearning, existing theories can be harnessed to provide a rich learning experience in MLearning. Naismith *et al.* (2004), have, during their review of MLearning literature, proposed to solve the dearth in MLearning theories by considering new practices against existing learning theories – behaviourist, constructivist, situated, collaborative, informal and lifelong learning theories.

The behaviourist learning theory emphasizes activities that promote learning as a change in learner’s observable actions. The learning should invoke a stimulus and a response. In the case of MLearning, an SMS message, for example, invokes a stimulus that may lead to an action as a response.

The constructivist learning theory emphasizes activities in which learners actively construct new ideas or concepts based on both their previous and current knowledge. With a mobile phone learners can construct their own knowledge and share it freely with peers at anytime in any place. This in MLearning is referred to as “participatory simulations” (Naismith *et al.*, 20061).

The situated learning theory emphasizes activities that promote learning within an authentic context and culture. Mobile devices are especially well suited to context-aware applications simply because they are available in different contexts, and so can draw on those contexts to enhance the learning activity.

The collaborative learning theory emphasizes activities that promote learning through social interaction. Through conversations on mobile phones collaboration can be enhanced.

The informal and lifelong learning theory promotes activities that support learning outside a dedicated learning environment and formal curriculum. Mobile technologies can support informal learning, which may be intentional or accidental (Sharples, 2000).

Intentional learning may be acquired through, for example, intensive, significant and deliberate learning efforts, while accidental learning may be acquired through conversations, TV and newspapers, observing the world or even experiencing an accident or embarrassing situation. As was found by Vavoula (2005), the majority of learning episodes in adults is informal.

Technological innovations and learning

Usually new technologies are embraced on the surface with no deep understanding of their fullest potentials (Graham, 2004). MLearning being a young field, its impact and capabilities have not been fully explored. It is well known that most computer users exploit only a small proportion of the technology available to them, and that immensely powerful machines are often used as little more than hi-tech typewriters and calculators. Keegan (2005) has observed that the mobile phone has been around for a couple of years with little regard to its potential for learning.

For an innovation which necessitates technological change and social re-organization, Graham (2004) proposes a framework to answer questions such as:

- what the anticipated benefit of the innovation will be and whether there will be genuine additional benefits;
- whether the chance of its being implemented successfully is much higher than the chance of its failure;
- what the cost of its introduction would be in terms of disruption to existing systems that are known, tried and reliable;
- how stable the circumstance in which the proposed innovation is to be made; and
- whether there are recurrent patterns of behaviour that would give some pointers to its likely reception?

Relatedly, Conole (2004) while considering underpinning technology of e-learning also asks questions such as:

- What are the new and emerging technologies and how can they be used to support learning and teaching?
- What learning platforms are being used and how do they compare?
- What are the emerging new software and hardware systems?
- How can we explore mobile and smart technologies? and
- What ways are in-built tracking mechanisms within MLearning systems giving rise to surveillance issues?

These questions bear directly on the lives of people for whom the innovation is intended. These questions ought to be answered before undertaking any new technological innovations. IT projects have been undertaken whose results have not benefited the intended users. Care ought to be taken because; in the name of technological improvement, a huge cost in terms of personnel as well as money can be incurred quite pointlessly.

Organizational issues of MLearning

To effectively use MLearning in an organization, MLearning designers need to understand:

- how the different stakeholders (academics, support staff, administrators, senior managers and students) currently work;
- the mechanism and procedures for developing shared knowledge banks of expertise and information;
- the need to outline roles and responsibilities for MLearning activities – management, technical, research, dissemination, evaluation and training;
- the different views to MLearning and its role – academics vs support staff;
- how the institution divides roles and the responsibilities for MLearning; and
- how much training and support the staff are to get (Conole, 2004).

Application of MLearning

Several large scale initiatives (e.g. MobiLearn (MobiLearn, 2005), MLearning (MLearning, 2005), From e-Learning to MLearning (Ericsson, 2002)) have been investigating the potential benefits of this new pervasive approach to learning. An MLearning survey in UK's schools and higher education has suggested that young adults (16-24) are switched onto learning by mobile phones and PDAs (LSDA, 2003). Goh and Kinshuk (2006) have cited several MLearning initiatives. These include among others: games-oriented implementation for m-portal (Mitchell, 2003); class room of the future (Dawabi *et al.*, 2003); hands-on scientific experimentation and learning (Milrad *et al.*, 2004); mobile learning system for bird watching (Chen *et al.*, 2003) and context-aware language learning support system (Ogata and Yano, 2004).

Goh and Kinshuk (2006) further identify current research areas and therefore applications of MLearning in games and competitive learning, classroom learning, laboratories learning, field trip learning, distance learning, informal learning, MLearning pedagogy and theories, learning and teaching support, MLearning architecture and MLearning evaluation, requirements, and human interface.

Goh and Kinshuk provide possible applications of MLearning in each research area identified above. Through the use of interactive games and contests installed on mobile devices, learners can construct their own knowledge and share among themselves. In the classroom, MLearning integrates with online learning management systems to provide tools for brainstorming, quizzing, and voting. In the laboratory, MLearning supports individual learning as well as collaboration learning. Mobile devices can be of benefit to laboratory environments for data gathering and control. In field trips, mobile devices support learning by collecting pictorial and textual data. Their mobility enables learning to take place in the field. In distance learning mobile devices support the delivery of synchronous and asynchronous learning while in informal settings the devices support incidental and accidental learning. MLearning supplements formal learning and teaching. Examples of content reusability frameworks are given in architecture issues of MLearning. Mobile evaluation, requirements, and human interface look into issues related to human computer interface while using mobile devices for learning.

Challenges to MLearning

Some pessimists have come out to say MLearning will not work. Keough (2005) advance seven reasons as to why MLearning will not work. According to him MLearning as a concept alone is doomed to failure because as a learning model it appears:

- to be technology driven: MLearning alone is a technology driven concept;
- not cogniscent of market usage: we know too little about what mobile devices are used for;
- yet to adopt discoveries in Cyberspsychology: we know too little about flow and learning relationships/networks or the transactional analysis of mobile relationships;
- not to change entrenched institutionalised education models: cultures of education and communications reflect government control measures;
- to rely on nascent consumer technology: mobile devices are inherently dissatisfying by never quite meeting every promised need for the consumer.
- to be short on standards to overcome cultural differences: while standards are slow to emerge Governments are rapidly regulating and limiting the use of mobile communications technology; and
- to lack a mobigogy: teaching and learning models are needed (Keough, 2005, p. 1).

Such pessimism is uncalled for. The World is dynamic. Technology, cultures, teaching and learning models, methods, just to mention but a few, are not static. MLearning just like any immature field requires time to grow. Besides, advocates for MLearning recognize the fact that it cannot be used alone in its entirety. It has to be blended with other methods of delivery including face-to-face, print and online learning. With ubiquitous computing in sight, we cannot delineate our selves from MLearning.

The truly big challenge for the educators and technology developers of MLearning is to find ways to ensure that this new learning is highly situated, personal, collaborative and long term; in other words, truly learner-centred learning.

The future of MLearning

The future of MLearning is forecasted to be bright. The capabilities of mobile phones, PDAs and smart phones are always on the move to higher ends. Research endeavours in this field are magnanimous (Woukeu *et al.*, 2005). Integrated context-aware capabilities will transform everyday activities by providing the ability to capture details about the time, location, people around you and even the weather (Naismith *et al.*, 2004). The entire internet will become both personal and portable. Such technologies will have a great impact on learning. Learning will move more and more outside of the classroom and into the learner's environments, both real and virtual and the MLearning is well positioned to champion these innovations.

Conclusion

As we progress through the twenty-first century, and the already hectic pace of our lives increases, society will need to find faster and more inventive ways to utilize previously unproductive time (Geddes, 2004). Life-long learning will be essential for

maintaining a competitive advantage in the global economy, for personal growth, and for simply functioning efficiently in an increasingly technological environment. With an increasing requirement to conduct learning activities independently, the ability to read and comprehend, and to metacognitively analyse and understand our learning processes, will be key factors in our successful development and our ability to function in the twenty-first century. These requirements and skills can be improved through the use of MLearning. It provides access to learning during previously unproductive times, it allows more flexible and immediate collaborative options, it allows controlled learning in contextual situations, and provides greater options for teachers to observe and assist in independent learning.

References

- Attewell, J. (2005), *Mobile Technologies and Learning: a Technology Update and MLearning Project Summary*, Learning and Skills Development Agency, London, available at: www.LSDA.org.uk (accessed 30 May 2006).
- Brown, H.T. (2005), "Towards a model for MLearning", *International Journal on E-Learning*, Vol. 4 No. 3, pp. 299-315.
- Chen, Y.S., Kao, T.C. and Sheu, J.P. (2003), "A mobile learning system for scaffolding bird watching learning", *Journal of Computer Assisted Learning*, Vol. 19, pp. 347-59.
- Conole, C. (2004), "E-Learning: the hype and the reality", *Journal of Interactive Media in Education*, Vol. 2004 No. 12, available at: www.jime.open.ac.uk/2004/12/conole-2004-12.pdf (accessed 30 May 2006).
- Dawabi, P., Wessner, M. and Neuhold, E. (2003), "Using mobile devices for the classroom of the future", in Attewell, J. and Savill-Smith, C. (Eds), *Learning with Mobile Devices. Research and Development*, Learning and Skills Development Agency, London.
- Ericsson (2002), "From e-Learning to MLearning EU project", available at http://learning.ericsson.net/mlearning2/project_one/index.html (accessed 31 May 2006).
- Geddes, S.J. (2004), "Mobile learning in the 21st century: benefit for learners", *Knowledge Tree e-journal*, Vol. 30 No. 3, pp. 214-28.
- Graham, G.E.I.e. (2004), "E-learning: a philosophical enquiry", *Education + Training*, Vol. 46 Nos 6/7, pp. 308-14.
- Keegan, D. (2005), "The incorporation of mobile learning into mainstream education and training", in *Proceedings of the 4th World Conference on MLearning (MLearning: 2005)*, SA, 25-28 October.
- Keough, M. (2005), "7 reasons why MLearning doesn't work", available at: www.mlearn.org.za/CD/papers/McMillan-Keough.pdf (accessed 1 June 2006).
- Knowledge Anywhere (2002), *Flexible Learning: Mobile Learning Objects, A White Paper*, available at: www.ottersurf.com/MLO-WP.pdf (accessed on 31 May 2006).
- LSDA (2003), "Mobile phones switch young people on to learning", *Mlearning Project Report*, Learning and Skills Development Agency, London, available at: www.lsdA.org.uk/files/pdf/press/7feb2003.doc (accessed 31 May 2006).
- Milrad, M., Hoppe, U., Gottdenker, J. and Jansen, M. (2004) in Roschelle, J., Kinshuk, C. and Yang, S.J. H. (Eds), "Exploring the use of mobile devices to facilitate educational interoperability around digitally enhanced experiments", *Proceedings of the 2nd IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE 2004)*, Mobile Support for Learning Communities, Taoyuan, Taiwan, March.

- Mitchell, A. (2003), "Exploring the potential of a games-oriented implementation for m-portal", in Attewell, J. and Savill-Smith, C. (Eds), *Learning With Mobile Devices. Research and Development*, Learning and Skills Development Agency, London.
- Mitchell, P.D. (2000), "The impact of educational technology: a radical reappraisal of research methods", in Squires, D., Conole, G. and Jacobs, G. (Eds), *The Changing Face of Learning Technology*, University Wales Press, Cardiff, pp. 51-8.
- MLearning (2005), "MLearning: learning in the palm of your hand", available at: www.MLearning.org/ (accessed 31 May 2006).
- MobiLearn (2005), *MobiLearn Project*, available at: www.mobilearn.org/ (accessed 31 May 2006).
- Naismith, L., Lonsdale, P., Vavoula, G. and Sharples, M. (2004), *Literature Review in Mobile Technologies and Learning, Report 11. A Report for NESTA Futurelab*, available at: http://elearning.typepad.com/thelearnedman/mobile_learning/reports/futurelab_review_11.pdf (accessed 30 May 2006).
- Ogata, H. and Yano, Y. (2004), "Context-aware support for computer-supported ubiquitous learning", in Roschelle, J., Chan, T.W., Kinshuk, D. and Yang, S.J.H. (Eds), *Proceedings of the 2nd IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE 2004), Mobile Support for Learning Communities, Taoyuan, Taiwan*.
- Prensky, M. (2004), *What Can You Learn from a Cell Phone? – Almost Anything*, available at: www.marcprensky.com/writing/Prensky-What_Can_You_Learn_From_a_Cell_Phone-FINAL.pdf (accessed 29 May 2006).
- Sharples, M. (2000), "The design of personal mobile technologies for lifelong learning", *Computers and Education*, Vol. 34, pp. 177-93.
- Sharples, M., Taylor, J. and Vavoula, G. (2005), "Towards a theory of mobile learning", in *Proceedings of the 4th World Conference on Mlearning (MLearning 2005), SA, 25-28 October*.
- Goh, T. and Kinshuk, D. (2006), "Getting ready for mobile learning – adaptation perspective", *Journal of Educational Multimedia and Hypermedia*, Vol. 15 No. 2, pp. 175-98.
- Vavoula, G.N. (2005), "D4.4: a study of mobile learning practices", *Report of MobiLearn Project*. Available at: www.mobilearn.org/download/results/public_deliverables/MOBILearn_D4.4_Final.pdf (accessed 30 May 2006).
- Woukeu, A., Millard, E.D., Tao, F. and Davis, C.H. (2005), "Challenges for semantic grid based mobile learning", *IEEE SITIS*, Vol. 2005, available at: www.u-bourgogne.fr/SITIS/05/download/Proceedings/Files/f135.pdf (accessed 1 June 2006).

Corresponding author

Paul B. Muiyinda can be contacted at: mpbirevu@iace.mak.ac.ug