

## Chapter 4.5

# M-Learning with Mobile Phones

**Simon So**

*Hong Kong Institute of Education, Hong Kong*

### INTRODUCTION

The Internet is a major driver of e-learning advancement and there was an estimate of over 1000 million Internet users in 2004. The ownership of mobile devices is even more astonishing. ITU (2006) reported that 77% of the population in developed countries are mobile subscribers. The emergence of mobile, wireless and satellite technologies is impacting our daily life and our learning. New Internet technologies are being used to support small-screen mobile and wireless devices. In a field marked by such rapid evolution, we cannot assume that the Web as we know it today will remain the primary conduit for Internet-based learning (Bowles, 2004, p.12). Mobile and wireless technologies will play a pivotal role in learning. This new field is commonly known as mobile learning (m-learning).

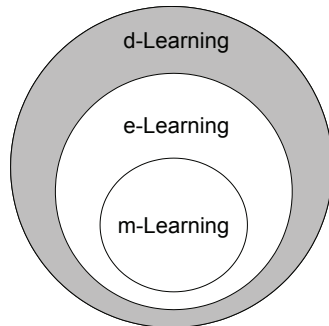
In this article, the context of m-learning in relation to e-learning and d-learning is presented. Because of the great importance in Web-based technologies to bridge over mobile and wireless technologies, the infrastructure to support m-

learning through browser-based technologies is described. This concept represents my own view on the future direction of m-learning. An m-learning experiment, which implemented the concept, is then presented.

### BACKGROUND

Many researchers and educators view that m-learning is the descendant of e-learning and originates from d-learning (Wikipedia M-Learning, 2006; Georgiev, Georgieva, & Smrikarov, 2004). The m-learning space is subsumed in the e-learning space and, in turn, in the d-learning space, as shown in Figure 1. This may be true chronologically. D-learning has more than hundred years of evolution starting from the printed media of correspondence (signified by carefully designed and produced materials by specialists to support the absence of instructors and independent study [Charles Wedemeyer] and the industrialization of teaching [Otto Peters]), to mass and broadcast media (marked by the open-

Figure 1. M-learning space as part of e-learning and d-learning spaces



ing of British Open University in 1961 [Daniel, 2001]), and to the telecommunication technologies supporting asynchronous and synchronous learning through teleconferencing, computer mediated communication and online interactive environments for students to create and re-create knowledge individually or collaboratively. In d-learning, the teacher and students are separated quasi-permanently by time, location, or both (Keegan, 2002; ASTD Glossary, 2006). With the advent of computer and communication technologies, e-learning covers a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms, and digital collaboration (ASTD Glossary, 2006). The delivery of content is through a media-rich and hyperlinked environment utilizing internet-working services. M-learning can be considered as learning taking place where the learner is not at a fixed, predetermined location, or where the dominant technologies are handheld devices such as mobile phones, PDAs and palmtops, or tablet PCs. It can be spontaneous, personal, informal, contextual, portable, ubiquitous and pervasive (Kukulska-Hulme & Traxler, 2005, p. 2).

In my view, new concepts in teaching and learning can be generated from m-learning. For example, mobile phones can be used as voting devices for outdoor learning activities or in classrooms without computer supports, as interactive

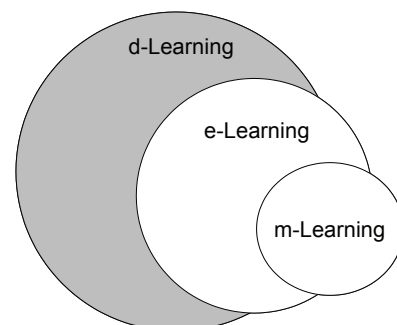
devices in museums, positioning or data logging devices at field trips or in many pedagogical situations. The justification of m-learning being descendent of e-learning and d-learning is rather thin, and Figure 2 is better represented. Furthermore, not everything can be delivered through m-learning. The small form factor, one-finger operation in some cases—slow computational and communication speed, short battery life and limited multimedia capabilities in contrast with computers do not really suit applications requiring heavy reading, high over-the-air communication and a lot of typing or texting.

In summary, m-learning is restricted and expedited by its nature. Different teaching and learning applications require different approaches, whether it is in d-learning, e-learning or m-learning. We must keep in mind their salient characteristics in different teaching and learning contexts, as shown in Table 1.

## M-LEARNING INFRASTRUCTURE

In order to support m-learning, mobile devices such as PDAs, mobile phones and tablet PCs, together with servers such as Web servers, streaming servers and database servers on top of applications such as specific adaptation of LMS must

Figure 2. Overlapping and differential spaces of m-learning, e-learning and d-learning



5 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/learning-mobile-phones/26592](http://www.igi-global.com/chapter/learning-mobile-phones/26592)

## Related Content

---

### Smart Tourism Technologies in the Consumer Experience Journey

Yigit Yurderand Mehmet Altug Sahin (2022). *Mobile Computing and Technology Applications in Tourism and Hospitality* (pp. 44-71).

[www.irma-international.org/chapter/smart-tourism-technologies-in-the-consumer-experience-journey/299085](http://www.irma-international.org/chapter/smart-tourism-technologies-in-the-consumer-experience-journey/299085)

### Mobile Transaction Processing System

(2018). *Advanced Mobile Technologies for Secure Transaction Processing: Emerging Research and Opportunities* (pp. 64-112).

[www.irma-international.org/chapter/mobile-transaction-processing-system/188299](http://www.irma-international.org/chapter/mobile-transaction-processing-system/188299)

### Systems Development Methodology for Mobile Commerce Applications

Muazzan Binsalehand Shahizan Hassan (2011). *International Journal of Mobile Computing and Multimedia Communications* (pp. 36-52).

[www.irma-international.org/article/systems-development-methodology-mobile-commerce/58904](http://www.irma-international.org/article/systems-development-methodology-mobile-commerce/58904)

### A Self-Configurable Event Coverage Approach for Wireless Sensor Networks

Ajay Kaushik, Ravi Teja Yakkali, S. Indu, Feroz Ahmed, Daya Gupta, Raunaq Nayarand Sahil Yadav (2019). *International Journal of Mobile Computing and Multimedia Communications* (pp. 1-18).

[www.irma-international.org/article/a-self-configurable-event-coverage-approach-for-wireless-sensor-networks/227358](http://www.irma-international.org/article/a-self-configurable-event-coverage-approach-for-wireless-sensor-networks/227358)

### Advanced Resource Discovery Protocol for Semantic-Enabled M-Commerce

M. Ruta (2007). *Encyclopedia of Mobile Computing and Commerce* (pp. 43-50).

[www.irma-international.org/chapter/advanced-resource-discovery-protocol-semantic/17050](http://www.irma-international.org/chapter/advanced-resource-discovery-protocol-semantic/17050)