Chapter 3
Researching Mobile Learning: Understanding the Relationship Between M-Learning and Mobile HCI

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ABSTRACT

m-Learning (mobile learning) is an exciting research field but few studies address the potential effect of human-computer interactions on users’ learning experience. A well-designed mobile learning study should consider the potential confounding variables of user context and usability. The purpose of this chapter is to inform readers of current research in m-learning and mobile HCI (human-computer interactions). The chapter will provide an example of a study that was designed to address the important factors of user context and usability.

INTRODUCTION

Mobile learning, m-Learning, is an exciting field of educational research. Exploiting personal digital assistants (PDA), smartphones, and ultra-mobile computers, a growing body of evidence supports the assertion that students are learning using mobile devices (Basoglu & Akdemir, 2010; Chen & Li, 2010; Stockwell, 2010; Thornton & Houser, 2005; Wong & Looi, 2010; Zhang, Song, & Burston, 2011). For example, PDAs have been used to enhance vocabulary learning of English in Turkey and China (Basoglu & Akdemir, 2010). In the health professions, mobile devices are helping to educate patients and allow physicians to access vital medical databases (Ranson, Boothby, Mazmanian, & Alvanzo, 2007). Also, mobile devices are being used to teach mathematics in secondary schools in South Africa (Roberts & Vänskä, 2011) and for geo-tagging photographs in student field work in geography (Welsh, France, Whalley, & Park, 2012).

However, in spite of these successes, a review of the literature reveals there is no firm consensus amongst researchers on what constitutes a successful m-Learning environment (Laouris & Eteokleous, 2005; Najmi & Lee, 2009; Traxler, 2007) and a limited number of studies connect to research in the...
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area of Mobile HCI (mobile human-computer interactions) context (Botha, Van Greunen, & Herselman, 2010). It should also be noted that the term mobile device is used to represent a vast array of technology devices from laptop computers, to cell phones, to smartphones (Sahilu, Ahmad, & Haron, 2011). Over the past 20 years, mobile learning has meant the use of everything from a laptop to Palm pilots to a modern smartphone of today. This diversity of technical devices and definitions has complicated research in the area of m-Learning.

To better define the type of devices used for mobile learning, Traxler (2005) proposed that the definition should be narrowed to “hand-held” devices; implying technology that can be held in one’s hand is the predominate technology for mobile learning. This idea of using technology that is handheld and highly mobile defines a certain user context for usage. Although some traditional usability structures may be sufficient for m-Learning, not all will work. Ryan and Gonsalves (2005) recommend designs that would limit the amount of data input and control what is being displayed on the screen to material that fits a mobile application perspective. Traxler (2009) correctly recognizes that context is highly important to the user experience with mobile devices. For example, the ways in which users interface with personal computers differs significantly from that of the modern smartphone. And while smartphone adoption is fueling a growth and interest in m-Learning, its unique features implies that instructional, interface and research designs need to be adjusted to address user context within the mobile space defined by this unique device. What constitutes m-Learning is no longer a luggable form of e-Learning but one that has its own unique user context and requires different approaches for research. To design and conduct research in the area of m-Learning, one has to take time to understand how individuals use mobile devices in their everyday lives.

People are no longer using the personal computer, traditionally the purview of e-Learning, exclusively to surf the Internet to find their needed information and many learning management system (LMS) vendors are taking notice. The delivery of existing e-Learning instruction onto mobile devices is a significant trend in the past decade. Products like Moodle and Blackboard have dominated the online and blended experience of students over the past decade. The growth of mobile technologies has pushed many LMS vendors to develop their products for display on mobile devices like the Apple iPad and iPhone. A recent review of LMS products for mobile spaces finds that a vast majority are minimally offering everything from application programmer interfaces (APIs) for mobile to full functioning mobile LMS products (Woodill, 2011). Many of these vendors are investing much time and effort into the development of mobile versions of their products. In addition to vendors, administrators in higher education have taken notice that students are bringing a wider array of devices to campus. There are many efforts to support the “bring-your-own-device” model of technology adoption in higher education. Increasingly students are not only bringing laptops, but they are also bringing a smartphone. According to a 2010 report from The Campus Computing Project, 73% of administrators surveyed believe that mobile learning management system (mLMS) apps are an important part of a technology plan for a campus, but many of these apps are in an early phase of implementation (Green, 2010).

The goal of most mLMS apps is to simply display course information from the parent LMS on the mobile device. This rightfully or wrongly assumes that m-Learning is nothing more than a portable form of e-Learning. Like their desktop version of the LMS, these mobile apps only shrink down the desktop experience. There is no enforcement of specific design elements for how instruction should be presented in a mobile user context. Understanding how instruction should be designed in a mobile user context presents significant challenges for educators. Specifically, content and user interfaces need to be designed around how people interact with mobile devices. Bogdanovic et al. (2014) studied the difference
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