

Chapter 29

Augmented Reality With Mobile and Ubiquitous Learning: Immersive, Enriched, Situated, and Seamless Learning Experiences

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ABSTRACT

Augmented Reality is generally used with mobile and ubiquitous technologies and they become widespread and are being used in education increasingly. Mobile and wearable devices as hard technologies, augmented and virtual reality as soft technologies has improved in a fast pace that we cannot predict what will the future introduce to us tomorrow. These hard and soft technologies provide immersive, enriched, situated and seamless learning experiences through mobile and ubiquitous learning. Considering the technology centric learning models, this chapter examines the mobile learning and augmented reality in terms of the opportunities they offer for learning. Following that, this study explains ubiquitous learning as a future learning model and use of augmented reality within this perspective.

INTRODUCTION

In 21st century, a technological blast occurred and it echoed in many fields of our technology centric globe. The educational paradigm reacted this blast and as a result, new teaching and learning approaches emerged. One of the significant adaptation of technology driven educational paradigm was electronic learning (e-learning) that mainly uses information and communications technologies to deliver teaching and learning content. As an extension of e-learning, mobile learning (m-learning) has become another alternative that promises anytime and anywhere learning. New mobile devices were designed like a Swiss army knife, accommodating many features in one place. The powerful “all in one” mobile devices paved the way for m-learning. These developments made augmented reality technology available for the latest generation mobile devices. As a reflection to these changes, the purpose of this chapter is to define, discuss and explain mobile learning, ubiquitous learning and augmented reality in terms of educational perspective on the basis of a comprehensive literature review.

DOI: 10.4018/978-1-5225-5469-1.ch029

MOBILE LEARNING: JUST IN TIME, JUST ENOUGH AND JUST FOR ME

There are many definitions about what the m-learning is. On the other hand, many of these previous definitions are technology centric and not valid anymore as the mobile technologies advancing rapidly. Traxler (2005) defines m-learning as any educational provision where the sole or dominate technologies are hand held and palmtop devices; According to Trifonova (2003) m-learning is any form of learning (studying) and teaching that occurs through a mobile device, or in a mobile environment; Quinn (2000) defines m-learning as e-learning through mobile computational devices and Harris (2001) defines it as the point at which mobile computing and e-learning intersect to produce an anytime, anywhere learning experience. The distinction among e-learning, m-learning and u-learning is the technology they depend on. With this in mind, we define mobile learning as any learning form that uses mobile technologies to provide just in time, just in place, just for me experience.

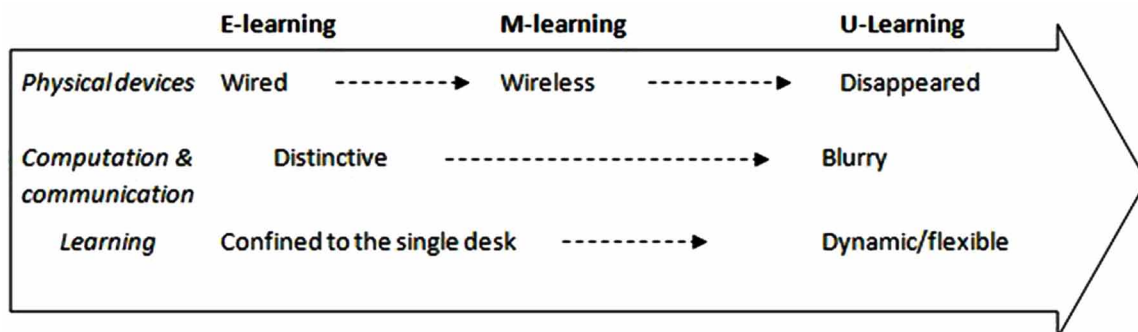
Within a holistic perspective, e-learning is the marriage of technology and education (Siemens, 2002) and m-learning is extension of e-learning (Kinshuk, 2003). It is further explained that m-learning actually means “mobile e-learning” (Mehdipour & Zerehkafi, 2013). Finally, ubiquitous learning (u-learning) appears as extension of e/m-learning. Figure 1 illustrates these conceptual shifts from e-learning to m-learning then to u-learning (Park, 2011).

DIGITAL, NOMADIC, ANYTIME, ANYWHERE

According to CISCO (2013), at the end of the year 2013, mobile devices connected to each other exceeded the whole human population all around the world. This data indicates that educators and learners should comprehend and take advantage of the opportunities derived from differences between the ‘physical vs the digital and the sedentary vs the nomadic’ (Alexander, 2004) paradigm shift that emerged as a natural consequence of technological developments. In addition to that situation, considering that only 20 percent of what’s learned on the job comes from formal learning (Cross, 2005), m-learning rises as the complementary part of lifelong learning.

In today’s world, mobile devices and technologies are pervasive and ubiquitous, and are increasingly changing the nature of knowledge and discourse in societies where these technologies are available. This, in turn, changes both the nature of learning both in formal and informal spheres and alters the ways that

Figure 1. Comparisons and flow of e/m/u-learning (Park, 2011)



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