Chapter 7
In Search for a "Good Fit" Between Augmented Reality and Mobile Learning Ecosystem

Miraç Banu Gundogan
Middle East Technical University, Turkey

ABSTRACT

Ecosystems are particular areas in nature where all living and nonliving components interact with each other and their environment. The term has also been used as a metaphor in scientific and social contexts. Learning ecosystem is one of these which studies the components and interactions of learning processes. Augmented reality is among the components of a (mobile) learning ecosystem. Potentials of integrating augmented reality in mobile learning are not denied, yet there are concerns that these might turn into short living fashion items if their long term consequences are not considered. Defining a mobile learning ecosystem, clarifying the position of augmented reality component within, describing its relations with other components and searching for a balance in these interactions would be an answer to these concerns. This chapter gives an answer by presenting mobile learning ecosystem and augmented reality definitions derived from a Delphi study carried out in 2016 in Turkey. The results and discussions present a "good fit" framework for a viable mobile learning ecosystem.

INTRODUCTION

Technology usage has always supported learning, moreover, the advances in Information and Communications Technology have made digital media part of our everyday lives, including education. In a survey conducted in 2008 for The Economist Intelligence Unit report, 63% of respondents have stated that technological innovation will have a major impact on teaching methodologies over the coming years and technology is marked as a core differentiator in attracting students and corporate partners regarding educational services. Scholars approach this situation cautiously; Ficheman and de Deus Lopes (2008) draw attention to the gap between learners and teachers in terms of technology usage. They state that learners mostly are digital natives familiar with the hyperlinked and interactive world

of digital technology and expect these in their learning processes, whereas, currently most teachers still being digital immigrants are struggling to adapt both to the technological advances and the demanding learners. Laziness is declared as another negative effect of wide technology usage in education by Ramey (2012) who states that technology users being so dependent on advanced tools become idle and less innovative and learners become more dependent on computing even to solve simple tasks. Bower, Howe, McCredie, Robinson, & Grover (2013) state that the pace of educational research is not keeping up with the advances in technology and as a result, not pedagogy but technology, accompanied by risks, is shaping the way people learn.

These risks need to be taken into account for mobile learning as well. In mobile learning, not only the tools and content, but the learner also is mobile. Any mobile learner using a mobile tool and has access to a network to communicate with others can reach a learning content. Although by definition, this technology is designed to facilitate, support, enhance and extend learning, literature presents important concerns. The Economist Intelligence Unit report (2008) presents assumptions which state that easy and ready access to mobile technologies may be disruptive in ways not intended such as a rise in student plagiarism, cheating and distractibility. Kearney, Schuck, Burden and Aubusson (2012) highlight the need for a pedagogical perspective in which authenticity, collaboration and personalization stand as critical concepts. They further state that the mobile environment needs to be designed cautiously since technology strongly influences learners' experience. Jackson (2013) highlights the difficulty in making technology decisions since hardware, software and operating systems are continuously changing and states that using massive expensive new technology may not end up improving the quality and effectiveness of learning.

Augmented reality, one of the supportive tools used in mobile learning also is facing concerns. Its contribution as a learning tool is not denied, yet, there are criticisms on its design and use. Although it provides a rich multimedia presentation which addresses different senses of learners and improves learning experiences by complementing the actual content, treating it as a tool or even a consumable within digital learning environments may have undesirable consequences. Höllerer (1997) highlights the risk of confusion which might take place when the user's view of the real world interferes with the virtual objects overlaid on the real world and Haag (2013) states that there are many examples of ineffective augmented reality applications which contain primitive forms of engagement, such as static graphics, and these cause distraction rather than engagement.

These opinions arise a challenging question; are we going to leave ways of learning into the hands of technology or should we search a conscious path encompassing the consideration of components and multidimensional interactions of any specific learning environment? One way to face this challenge is to refer to the ecosystem concept. Researchers with similar concerns have been studying these issues within ecosystem perspectives and presenting models where technology is analyzed as one of the many components interacting in a specific environment. Studies on digital learning ecosystems and usage of augmented reality in learning present valuable frameworks. The study presented in this chapter combines these frameworks with the results of a survey aiming to define a mobile learning ecosystem and discusses the position of augmented reality within this system.

The following sections present studies and definitions on digital and mobile learning ecosystems followed by guidelines on the design, implementation and evaluation of augmented reality applications in attaining efficient and sustainable learning experiences within these ecosystems.

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