Chapter 12
Use of Augmented Reality in Mobile Devices for Educational Purposes

Bülent Gürsel Emiroğlu
Kırıkkale University, Turkey

Adile Aşkım Kurt
Anadolu University, Turkey

ABSTRACT

Use of technology in education has been widespread in the last decade, thanks to developments and improvements in information and communication technologies, especially in mobile devices. Among the fields in which mobile devices play important roles, education is one of the leading ones. Mobile devices help teachers and learners access educational resources when needed. To increase the reality of virtual learning environments on mobile devices, Augmented Reality (AR) technologies were introduced for mobile platforms, and the term Mobile Augmented Reality (MAR) arose. MAR opens a new door for educators and trainers to experience new methods of teaching for mobile learners. In this chapter, educational use of AR on mobile devices will be explained. Throughout the content of the chapter, readers will be informed about how AR applications changed people's teaching and learning styles.

INTRODUCTION

Use of technology in education has been widespread in the last decade, thanks to developments and improvements in information and communication technologies, especially in mobile devices. Mobile devices, mostly referred "smart phones", enabled us to reach information anywhere and anytime much more easily. Among the fields in which mobile devices play important roles, education is one of the leading ones. Mobile devices help teachers and learners access educational resources when needed. To increase the reality of virtual learning environments on mobile devices, Augmented Reality (AR) technology has been adopted with the help of high-speed cellular networks and high performance graphical and micro processing capabilities of the latest smart phones.

AR can be defined as visualising the artificial world with virtual effects of real subjects with the help of computer-generated graphics, sound, speech, text, still and/or motion pictures, etc. It enables users of its system to perceive objects of the real world and discover their functionalities with the help of computer-generated visualizations. AR is somehow different from Virtual Reality (VR). AR is used to enhance the digital view of the real world whereas VR is used to create a virtual world in a digital environment. AR is used in many fields including entertainment, education, training, sports, modelling and simulation. Educational use of AR (for both teaching and learning) is gaining popularity and attention especially amongst the Z generation. As the use of mobile devices for accessing and using educational resources increased dramatically during the last decade, educational AR applications are mostly moved to mobile platforms.

With the AR movement in mobile platforms, the term Mobile Augmented Reality (MAR) arose. MAR opens a new door for educators and trainers to experience new methods of teaching for mobile learners and to try new techniques in this context and setting. MAR it enables its learners to access online AR resources without the limitations of physical locations of the learning activities and formal connections of the processes needed. MAR is accessible anytime and anywhere, enabling users to experience a new way of thinking and understanding by experiencing the augmented reality of the concepts shown. Educational MAR attracts learners and raises their motivation by providing augmented reality for the objects of the real world in virtual settings on mobile devices.

In this chapter, educational use of AR on mobile devices will be explained. Throughout the chapter, you will be informed about how AR applications changed people's teaching and learning styles with the help of incremented reality graphical software.

BACKGROUND

Thanks to developments and improvements in information and communication technologies, use of technology in education has been widespread in the last decade. Many studies exist for using suitable technology in educational environments to increase students' success (Kulik, 2003; Wenglinsky, 2006), fun, effective and active learning process (Korkmaz, 2013; Sumadio & Rambli, 2010). Many new tools and platforms exist in the educational field due to the developments in technology, such as social networks, educational blogs and wikis, web 2.0 – 3.0 tools, podcasting, interactive whiteboards, and mobile devices. As a generic term, mobile device refers to a variety of devices that allow people to access data and information from wherever they are (Bucki, 2016). Handheld and portable devices are generally called as mobile devices due to their lightness and compactness. New display, processing and storage technologies of mobile devices provided many facilities similar to high-tech personal computers (technopedia, 2016). Our daily lives have been widely affected by these mobile devices, especially in interaction, sharing, and communication with others. In recent years, mobile devices are growing in complexity and diversity, leading to providing new interaction paradigms, modalities, shapes, and purposes (de Sa & Carriço, 2010). Mobile devices have some advantages compared to laptops for using in teaching and learning (Warschauer, 2011):

1. Lightness and orientation flexibility for better digital reading or accessing of content.
2. Instant readiness and fast switching among applications for rapid starting in learning activities.
3. Better user interaction with the help of large touch screen display.

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