Chapter 15

Application of Virtual and Augmented Reality for Training and Mentoring of Higher Education Instructors

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ABSTRACT

The purpose of this chapter is to specify various notions of virtual reality (VR) and augmented reality (AR) including the historical development and illustrate how they are applied to train and mentor instructors in higher education settings. This study also presents various industry-wide examples of utilizing VR and AR for training and education. Benefits and limitations of using VR and AR in academic settings are discussed as well. Additionally, this study provides up to date VR and AR applications that can be adopted in training and mentoring instructors of higher education. Based on a comparative analysis of available technologies, the authors suggest possible future research to improve existing practices in the use of AR and VR in training and mentoring instructors in higher education settings.

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INTRODUCTION

Virtual reality (VR) has recently drawn attention with the dramatic advancement in technology, despite the fact that the word “virtual reality” was coined by Jaron Lanier in 1987 and used since its introduction. VR in general can be defined as, a multi-dimensional human experience, which is totally or partially computer-generated and can be accepted by those experiencing the environment as consistent (Seidel & Chatelier, 2013). The fundamental aspects of VR are (a) the utilization of computer-generated images or simulation; (b) to build an immersive virtual environment, and; (c) stimulation of sensorial interfaces (e.g. sound, vision).

Compared to VR, augmented reality (AR) is another emerging technology that integrates real life with modified and enhanced images or virtual objects. AR is generally achieved by the use of mobile devices to provide a composite experience or view through digital components combined with the real world. A good example of AR is the game Pokémon Go, which enables users to capture 3-D virtual characters in the real world.

Field of Applications of VR and AR

VR and AR have been widely used in different fields. Since their beginning, they have been used for military, industrial, navigation, and applications, and have since expanded to various areas. For example, AR (e.g., Google Glass) has been applied to public safety management and phone users by responding when a user speaks, touches the frame or moves the head. Many companies have begun advertising VR and AR applications in industries such as automotive driving assistance. AR allows any type of designer (e.g., car, buildings, etc.) to experience a product’s design and operation before completion. More often in recent days, mobile devices allow VR and AR to become a useful learning tool in education and training fields. In military settings, virtual maps and 360°-view camera-imaging can improve a soldier’s navigation and battlefield perspective. In medical fields, VR and AR have been used for diagnostic and therapeutic purposes with minimal surgical interventions. Another area is tourism, as travelers can utilize VR and AR to see informational displays of a location, historical events, landscape, and information provided by previous visitors.

AR and VR Applications for Training of Higher Education Instructors

Recently, there have been more attempts to broaden the use of AR and VR in higher education. Within an Educational Virtual Environment (EVE), both AR and VR are known to boost motivation for learning and effectiveness in training. Many researchers suggest that the use of AR- and VR-based training can have significant advantages over traditional training methods. For example, the use of AR/VR technologies presents greater access to educational resources and facilitates group experiences for encouraging communication, competition, and cooperation. Within an academic environment, AR- and VR-based training and mentoring are believed to improve instructor’s teaching effectiveness, competency-based skills, and cognitive development. At the same time, this approach will greatly reduce overall time and costs for instructor training and mentoring. In this context, many institutions try to adopt AR and VR as a way to train and mentor instructors within a more immersive learning environment.