

Chapter 13

Augmented Reality Implementations, Requirements, and Limitations in the Flipped-Learning Approach

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ABSTRACT

In the year 2016, flipped learning became an innovative learning approach. The students, in flipped learning, prepare to their courses watching the videos, listening to podcasts, and reading the articles prepared for themselves, and have a prior knowledge. In flipped learning approach, efficiency of learning materials is related to providing permanent learning, facilitating the learning and being interactive. For that reason, the students should be supported with stronger learning materials rather than the aforementioned materials. The most current one among these materials includes Augmented Reality implementations that have been prominent in recent years. In this chapter, flipped learning approach and augmented reality concept will be emphasized, augmented reality implementations possible to be used in flipped learning will be exemplified, and limitations will also be discussed.

INTRODUCTION

Education is one of the areas that the world leader, developed societies invest in. The most significant feature of societies which invest in education, which are also known as information societies is that they can successfully integrate training with new methods, approaches and technologies. In this way, it is possible to disseminate education services to a wide range of people and to ensure easy and permanent learning that is independent of time and place, to deliver updated information to people timely and to enable participatory education.

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Together with the development of new learning models, technology got integrated to education, and this has always been an important field of research. The technological developments at social and global levels, people's desire for education in order to get prepared for their work life, their willingness to study without delaying their works or social responsibilities and their lifestyle are significant factors for the transformations and innovations in education.

Transformation and innovations in education have gained a different dimension with the beginning of the studentship of the generation which is called as 'digital natives'. Digital natives have features such as using information technologies, being active, impatient, energetic, and being interested in software that includes animation. Because of these features, the use of traditional methods, techniques and technologies in education will be insufficient for the learning needs of the digital natives and it will affect their academic success negatively. Furthermore, the integration of education with contemporary teaching technologies, teaching and learning models and approaches as a result of globalization, is a necessity that cannot be delayed.

The flipped learning model is at the forefront of integrations that have attracted attention and produced successful results in recent years. Flipped learning is considered to be an appropriate learning model for digital natives, for whom individuality is a distinctive feature.

In today's technology, 3D models, video, photo and audio content have the ability to overlay on the actual image, with augmented reality which has a wide range of application areas. The most important feature of the augmented reality applications is that; they are real-time, and they aim to enrich the real world with the virtual data developed through computer systems. The augmented reality, which combines the real world with virtual and facilitates the understanding of abstract concepts and events, enriches the learning environments thanks to these features, and it is considered important as it supports learning by doing and experiencing.

Considering the knowledge and technology skills, which are among the learning and renewal skills that 21st -century students should have, the use of augmented reality applications in the flipped learning model becomes important.

This section will focus on the concepts of flipped learning model and augmented reality, the importance and advantages of using augmented reality in education, examples of augmented reality, the necessity of using augmented reality in flipped learning, possible limitations in practice and suggestions for overcoming these limitations.

BACKGROUND

The concept of flipped learning was first introduced in 2007 by Bergmann and Sams from Woodland Park High School, when they sent the course videos they recorded to their students over the internet. According to Bergmann and Sams (2012); in the flipped learning model, students follow video lessons recorded by the teacher to complete their homework and classroom works and to perform laboratory applications. In this way; they are able to achieve much deeper learning compared to the traditional learning models.

One of the most accepted definitions and explanations about this model belongs to Eric Mazur. According to Mazur, the flipped learning model consists of five stages: (November & Full, 2012);

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