Chapter 19

Implementation of Augmented Reality in "3.0 Learning" Methodology:
Case Studies with Students of Architecture Degree

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ABSTRACT

This chapter discusses the impact of using social media resources and new emerging technologies in teaching and learning processes. The authors of this chapter focus on Spanish architecture-education framework by analyzing three case studies carried out by students finishing architecture and building degrees. Students' interaction with this resources is assessed, as well as their derived academic results, and the degree of satisfaction from students and teachers using these resources and technologies. To conduct the study, the authors worked with Web based freeware applications, such as Dropbox, blogging systems, Moodle, YouTube, Wikipedia, and Google Maps. Mobile devices, such as smartphones and tablets PCs, were used to test QR-Codes (Quick Response Codes) and Augmented Reality technology based applications as Junaio and Ar-Media Plugin.

INTRODUCTION

The emergence of new communications technologies in all areas of society has created a new situation in the classroom: we can integrate these technologies into the dynamic role of education, or we can avoid them. But its implementation becomes increasingly common. Particularly representative is the use of Smartphones in the classroom as a new system of communication and interaction among students, as we can see in the next sections.

Websites and social media applications such as Twitter, WhatsApp, and so on, are used to create and exchange user-generated content. Social media is ubiquitously accessible and enables, by scalable communication techniques, to establish and build new social relationships. This fact continues in computer class, where students are easily disconnected from the teaching through distractions such as blogs, emails, and multimedia content sharing, a situation that we often see in our classrooms.

This situation is a reality. In today's mediated society (where the use of mobile and social services is extended to all diary situations), it is necessary to reformulate the teaching and learning methodologies, and to implement changes allowing the student to follow their studies using friendly technologies. As we can see in this chapter, several studies have shown that the integration of "social media", as an element in the teaching process, allows greater integration into student's learning pace and leads a better comprehension of all explained concepts related to the course and teaching material. Howard Rheingold (Rheingold, 2011), in his -opening keynote of the ACM-CHI 2011 in Vancouver, Canada, affirmed that these technologies and their application allow and include mindful participation, collaboration, critical consumption, and all basic skills in the new digital teaching systems. This new situation allows improvement of the school experience and satisfaction in the learning process (Richardson and Swan, 2003; So and Brush, 2008; Wise, Chang, Duffy and Del Valle, 2004; Dziuban, Moskal, Brophy and Shea, 2007). There are several studies and implementations in the use of social media systems and visual interaction in the pre-university education and higher education, especially in areas where the use of visual information is very important such as in the frameworks of multimedia, design, communication, or architecture. We can find examples in sports education (Wagner, 2011), medicine (Billings, Halstead, 2008), and even to the legal education (Russo, Squelch and Varnham, 2010).

The introduction of "Learning 3.0 methods," was a widely discussed concept in the past conference Learning 3.0, 2011. Over the last few years, these new cooperative technologies have been incorporated into all academic frameworks, offering new educational opportunities. But it seems to be a novelty in architecture studies. These methods allow the use of newest multimedia content, such as three-dimensional (3D) visualization models, immersive environments, new publication and presentation systems using social media, document-managing and editing tools, and other applications linked to the capacity of the technologies used.

In the specific framework of the architecture degree, these new technologies provide new tools for the representation of architectural forms and their content. These new tools such as, mobile devices, 2D codes or markers, and mobile-learning or augmented reality systems (AR), facilitate new ways to access information and provide us opportunities for teaching under the concept of 3.0. In our case, by the use of mobile technology, students have generated exhibitions and presentations that combine physical and virtual content linked with QR codes, a real 2D object to interact with virtual objects in the scene.

In this chapter, we will present three case studies carried out in the Architecture and Building Engineering faculties of both the BarcelonaTech University of Catalonia and the Ramon Llull University, in the Campus of Architecture in Barcelona and Tarragona. The main objective of this work in progress, as summarized in this chapter, is to improve the academic performance of students by introducing technologies they already use in their daily lives, even for leisure outside of university.

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