

# Virtual Worlds in the Educational Context



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## INTRODUCTION

Information and Communication Technologies (ICTs) are changing the daily activities of human beings, promoting the process of teaching and learning, facilitating the construction of knowledge. In recent years, ICTs are becoming stable in the educational context, as they allow different ways of presenting content to students (Quintana and Fernández, 2015). Technological resources to support the transmission of knowledge can be represented by heterogeneous formats, such as simulations, games, virtual worlds, videos, animated agents and avatars, web pages, among others.

Virtual worlds appear as technological tools to support construction of knowledge and for this reason has been the subject of study by different researchers over the past few years. There are many educational institutions that use virtual worlds, as they offer to the student an interaction similar to the real world, permits the student to get involved with various activities and learn in an interactive way, acquiring new skills (Mateu et al. 2013). Hulsey, Pence and Hodges (2014) point out that, students represented by avatars can get a better learning experience watching and/or participating in practical activities in virtual worlds.

Abreu et al. (2012) argue that the process of application development focused on education, in addition to the use of principles stemming from

Software Engineering (e.g. extraction requirements, requirements analysis and modeling), should be concerned with the incorporation of learning theories.

There is scientific evidence that shows promising results when researchers link pedagogical concepts in the construction and application of educational systems. Virtual learning environment Moodle, for example, was designed and developed from social constructivist epistemology (Moodle, 2016). Currently, numerous educational institutions, to support the process of teaching and learning, use this environment. In the field of virtual worlds, Nunes et al. (2016) show that use of Mastery Learning theory in the context of virtual worlds for education contributes to reveal optimistic results regarding performance advancement to the students.

Seeking to identify learning theories used in virtual worlds applied in the educational context and obtain an overview of what is being researched and developed in this area, as for in order to investigate the scientific production related to the theme and highlight possibilities for future research, this chapter has order to present a systematic review of literature. Thus, primary studies were researched in article format, indexed by journals and international conferences, considering the period of last five years (2010-2015). To achieve this, research questions was created aiming to consolidating quantitative and qualitative information found.

To present the research conducted; this chapter was organized with a descriptive section about the concepts inherent in virtual worlds, contextualizing the reader about this area. It is also presented some of the currently existing major difficulties and problems in this area, and later presented the listed research and analysis of the results obtained in this study. Finally, future directions for the application of virtual worlds in education and final considerations of this chapter is presented.

## **BACKGROUND**

Also known as, immersive virtual environments, virtual worlds are tools that permits reproducing aspects of the real world or fantasy in a virtual space, providing its users a controlled environment with numerous opportunities and experiences. Griol et al. (2014) corroborate stating that three-dimensional spaces are simulated by computer, which can be exploited in first or third person, through a graphical representation called avatar.

Increased use of virtual worlds in different application contexts, allowed their inclusion in the educational field, from which emerge new opportunities for use of these computing resources as support and even motivation in the learning process of its members. In this sense, is possible to claim that these immersive environments, besides offer a combination of simulation tools, which enhance user interactions and consequently the way they learn, also provide a sense of immersion, as well as the opportunity for communication and collaboration between its users, justifying its application in activities related to the educational field.

There are several possibilities to be explored using virtual worlds applied to education, e.g., as the extension trend of real laboratories for virtual environments, which according to Nunes et al. (2014), is possible offer new opportunities without costs and risks to users, besides to offer opportunity to operating virtual equipment's in controlled environments. It also offers easy access feature and available at all times; immediate

feedback; expertise distributed among users, where exchange of experiences with each other is possible; student-centered learning; and encouraging for practice of authorship.

In virtual worlds, besides users interact with three-dimensional and multimedia objects, they have the possibility to explore the interaction with other connected users using chat to communicate via instant messaging or through voice communication. This feature enables users to build their knowledge jointly, where each student can cooperate with a colleague, e.g., assisting in the resolution of a particular activity or simply discussing their understanding of a topic addressed during their interactions.

Several investigations in different areas has shown the use of virtual worlds with promising results, as well for building scenarios and attractive three-dimensional objects to improve user interactions and promote learning. Implementation of these environments demand that several factors be considered for development, such as: educational objectives, teaching strategies based on learning theories, friendly and instructional design, objects, experiments and exercises that encourage interaction and collaboration among users, besides passing the feeling of being immersed in the environment (Herpich et al., 2016).

## **ISSUES, CONTROVERSIES, AND PROBLEMS**

Taking into account the theoretical review presented above and expertise of the authors of this chapter, it was possible to make a number of considerations about some of the main problems that are included in the scope of this study, specifically the implementation of educational activities in virtual worlds. First, it becomes possible to identify an important point when comparing to a virtual learning environment like Moodle, where these have been developed with specific features for educational use with students, while the virtual worlds need to be adapted to use with this propose.

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