Chapter 8
Instructional Design Applied to TCN5 Virtual World

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ABSTRACT

This chapter presents the development and implementation of an instructional design (ID) for computer networks learning within a three-dimensional (3D) virtual world (VW) that considers characteristics of cognitive style and level of expertise of the student, titled TCN5. For this purpose, a hybrid model of ID was created based on ADDIE and Dick and Carey models. To facilitate the inclusion and management of didactic materials, an educational resources manager called GRECx was developed, which was allocated to the VW through web pages inserted in 3D media objects. The approach was submitted to the evaluation of a sample of students, who pointed out that it allows greater use of didactic materials within the immersive environment, and that GRECx can actually help teachers in the inclusion of resources, avoiding the need to deal with VW settings.

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INTRODUCTION

The use of virtual environments aimed at education, which offer the generation of knowledge in an innovative and appropriate way to the current computerized society, is becoming increasingly popular. However, only the existence of technology in the school environment is not enough for the success in the learning process (NASCIMENTO, 2006).

In this sense, there is an advance in the need of virtual environments customized for each student's specifications. According to Bates and Wiest (2004), a personalization of contents and of the environment according to their characteristics increase the motivation to learn. Cakir and Simsek (2010) also argue that this customization affects positively student performance.

In order to deal with this demand, differentiated ways to plan courses that fit these needs are being considered. One utilized method with this objective is the Instructional Design (ID), which according to Filatro (2008) aims to organize the learning script.

In this perspective, this study approaches the structuring of a ID for the learning of Computer Networks within a three-dimensional (3D) Virtual World (VW) called TCN5 (Teaching Computer Networks in a Free Immersive Virtual Environment) (VOSS, 2014), which has attributes of ubiquitous computing, as the adaptation to the student level of knowledge (expertise) in Computer Networks (POSSOBOM, 2014), and organization of pedagogical paths according to the preferences of the student Cognitive Styles (CS), being Holistic, Serialist, Divergent or Reflective (MOZZAQUATRO, 2010).

In order to expand the possibilities of this ID proposition, the educational resources manager aware of expertise (which we named GRECx) was developed. In this manager, the teacher can include files such as slide show, text, online text, image, video, task, and quiz, through a simple web interface. These features are sent directly to the VW and displayed on web pages allocated to 3D objects.

In the next sections we explain the concepts that embody this research, the development of the ID and the GRECx system, as well as the results achieved from their applications.

Virtual Worlds

A Virtual World (VW) can be considered a faithful simulation of a real environment, or the formulation of an imaginary, fictitious environment, created for coexistence and communication among people represented by avatars who perform actions and interact with one another (BACKES, 2012). These simulated environments have no concrete existence (DEMETERCO; ALCÂNTARA, 2004).