Chapter 11

A Framework for Designing Interactive Digital Learning Environments for Young People

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ABSTRACT

In this chapter a descriptive framework for designing interactive digital learning environments for young people is proposed. The proposed framework aims to analyse and compare interactive digital learning environments. This framework may be useful to guide the design of digital learning environments for young people and also to provide a structure for understanding the interface characteristics of such environments and how users interact with them. Young people's characteristics are briefly discussed in relation to the learning process. The approach to creating the framework is presented with the related literature. The framework is described and consists of three main components: learning, user interaction, and visual. Finally, conclusions on the design of interactive digital learning environments are drawn.

INTRODUCTION

The production of digital learning environments has been increasing considerably, especially with the rise in the number of users with a fast Internet connection, new devices, new technological possibilities, among other aspects. Online learning resources, such as content modules, learning objects and online learning communities, have become very popular (Oblinger, 2008).

Students have been taking advantage of these digital environments in order to improve their learning. Governments, organizations, private institutions, and teachers are providing interactive digital educational materials (paid or free) that aim to offer students additional educational resources for their learning process.

Many authors claim that the new generation, born from the 1990s onwards, has a different experience with digital environments because they have had experience in using digital media since they were very young. Researchers claim that different ways of teaching are needed in order to meet the needs of this new generation.

Interactive digital learning environments are therefore part of the learning process in the life of many children and young people nowadays. Among the positive characteristics of this type of learning environment are: they can be of different sizes (a module or an entire course); they can be reused many times in different contexts; they can be used simultaneously by many people; and new versions can benefit people immediately (Wiley, 2000). Examples of these kinds of learning material are: e-books, online games, presentations, applications, exercises, websites, and visualization information. These materials are available from different devices and platforms such as computers, tablets, mobiles, interactive environments in museums, or even in public and private organizations.

According to Trinidad et al. (2005) digital learning environments "can facilitate cognitive, as well as social scaffolding, enabling educators and students to become progressively more involved in the community and sustain their commitment and interests". Oblinger (2008) argues that immersive and authentic learning environments, such as simulations, visualizations, and augmented reality can engage and motivate the students. As he states: "there is a significant difference between learning about physics and learning to be a physicist, for example. Isolated facts and formulae do not take on meaning and relevance until learners discover what these tools can do for them".

Interactive designers have recently faced a new challenge: to design learning environments that answer the demands and expectations of this group of people and at the same time to understand the environment's possibilities, their usability and how users interact with them. Although much has been written and researched on many subjects related to the design of interactive environments, it seems that a great deal of research is still needed on how to create an effective, efficient and pleasant interactive learning environment for this new generation of users.

In this paper, a framework for designing interactive digital learning environments for young people is proposed. This framework is useful to guide design of digital learning environments for young people, and also to provide a structure for understanding interface characteristics of such environments and how users interact with them. It can also be used to evaluate the environment result. Good frameworks are believed to enhance the understanding of the environments at a higher level (Zhang et al. 2005c).

Young people's characteristics are briefly discussed in relation to the learning process. In this study, 'young people' refers to the age-group of around 9 to 19 years old. First, definitions of framework, e-learning and design are presented. Then, the approach to creating the framework is presented with the related literature. The framework is described. Finally conclusions on the design of interactive digital learning environments are drawn.

FRAMEWORK, E-LEARNING AND DESIGN DEFINITIONS

Frameworks

The concepts of framework, e-learning and design vary considerably in the literature. Therefore, it is important to define them for the purpose of this study. Frameworks have been frequently used in different subject areas with different purposes, such as to provide explanatory accounts, models and guidance (Rogers

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