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Development Of Serious Game To Improve Computer Assembly Skills

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Abstract

In this work-in-progress, we used the formal six facets model to design the game. These facets synthesize knowledge doing to guide the implementation of serious games. The game aims to help learners to improve skills to achieve the assembly of computer in a virtual laboratory. Well, they handled various components of computer, including: motherboards, processors, memories, buses, etc. The game is played in practicals work session and it is expected to include more levels, more challenges that the student should gradually resolve. This paper presents the steps followed for the implementation of this framework. Preliminary results of user experiences are reported, and an outlook on further steps is given.

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1. Introduction

Recent studies show that technology has changed the way that young people learn. It is clear; they have grown up in a digital environment with computers and mobile phones. It may be argued that the methods of teaching need to be changed to accommodate this new generation of learners and meet their expectations. Therefore, many researchers and educationists are focusing on developing improved and more effective teaching methods. Shadbolt(2008) noted that, learning will utilize game technologies as part of the learning experience. One of the reasons for using games is that they are known to be fun and entertaining and, when mixed with learning material,

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could attract learners to play and to remain engaged until the learning objectives have been achieved (Yusoff, 2009). For example, utilizing examples of real equipment and simulating real experience from inside a game will provide an optimal, meaningful, and engaging learning experience. Serious games provide a high fidelity simulation of special environments and situations that focus on high level skills that are required in the field and where decisions could be analyzed and evaluated. They present situations in a complex interactive context coupled with interactive elements that are designed to engage the trainees (Annetta& al., 2006).

The objective of the study reported in this paper is threefold: (a) Identify serious games attributes that support effective learning, (b) the design and the implementation of a serious game prototype that aims to improve students' skills to handle hardware and software components of a computer and (c) the evaluation of the impact of the use of this serious game on students as the learning outcomes and usability issues. This article represents our first step towards a more profound research program. The paper is organized as follows. In section 2 we provide some selected definitions of serious games. In Section 3, the design and the basic feature of the prototype are presented. The implementation of the serious game is reported in Section 4. Finally, we end the article with conclusion and d future work

2. Background

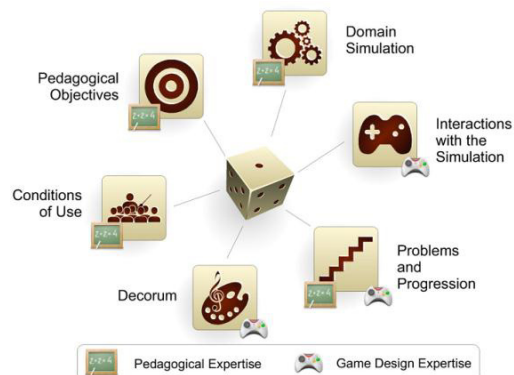
The concept of Serious Games still lacks a single definition. They are referred to all games that engage the user and simultaneously contribute to the achievement of a certain objective other than just entertainment, whether the user is aware of that fact or not (Barbosa & Silva, 2011). A number of authors have suggested that serious games are an application of gaming technology used to solve problems that are too expensive or too critical to conduct in real life, for example in education (Annetta& al., 2006), healthcare (Knight& al., 2010), sales and marketing (Susi& al., 2007).

Serious games are also used to make decisions in critical situations where the impact of decisions is elusive, and are hardly to manage. Otherwise, when the choice is made, and it is difficult to reverse (Mautone& al., 2008). According to Zyda(2005), “applying games and simulations technology to non-entertainment domains results in serious games”. Virtual environments and videogames offer students the opportunity to practice their skills and abilities within a safe learning environment, leading to a higher level of self-efficacy when faced with real life situations where such skills and knowledge are required.

The game-based simulation is starting to be employed in several areas. De Paolis (2012), present a serious game for training on suturing in laparoscopic surgery. It is focused on the physical modeling of the virtual environment and on the definition of a set of parameters used to assess the level of skills developed by the trainees. A pair of haptic devices has been utilized in order to simulate the manipulation of the surgical instruments. Barbosa and Silva (2011) describe Serious Game that would teach young students the basic functioning of our circulatory system.

3. Game concept and design

In this study, we draw on the work of Marne & al. (2011) to develop a serious game, using a methodology that ensures a clear relationship between learning objectives, aspects of the game and technical aspects (arrangement a



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