Chapter 14
A 360-Degree Perspective of Education in 3-D Virtual Worlds

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ABSTRACT

Three-dimensional virtual world environments are providing new opportunities to develop engaging, immersive experiences in education. These virtual worlds are unique in that they allow individuals to interact with others through their avatars and with objects in the environment, and can create experiences that are not necessarily possible in the real world. Hence, virtual worlds are presenting opportunities for students to engage in both constructivist and collaborative learning. To assess the impact of the use of virtual worlds on education, a literature review is conducted to identify current applications, benefits being realized, as well as issues faced. Based on the review, educational opportunities in virtual worlds and gaps in meeting pedagogical objectives are discussed. Practical and research implications are also addressed. Virtual worlds are proving to provide unique educational experiences, with its potential only at the cusp of being explored.

INTRODUCTION

Many instructors have looked to a range of technologies such as wikis and blogs (Guru & Siau, 2008) to discussion forums on Blackboard to better achieve these objectives but there are limitations faced. One particular technology that presents new opportunities to achieving these objectives is three-dimensional (3-D) virtual world technology which provides a common space for individuals to interact and creates a learning environment that can better suit their needs. One may establish replications...
of reality in this virtual space for individuals to explore or interact with. Stoerger (2008) suggests that one of the key elements of a virtual world is the visual creativity that it affords, while Gaimster (2008) identifies the rich immersive experiences as highlights of virtual worlds. Johnson and Levine (2008) suggest that a distinctive characteristic of virtual worlds is that users can determine the course of events to be experienced because of their ability to interact with peers (through their avatars) and objects in the environment. Whatever the purpose, the nature of virtual reality is such that students have the potential to become engaged in a simulated activity and collaborate in a dispersed setting that more closely replicates the advantages of being face-to-face.

In addition, changes in educational paradigms are creating a need for new technologies to support new learning environments. Dickey (2005a) cites that creating interactive learning environments is a current trend being supported by the increasing paradigm shift towards constructivism. The paradigm advocates that knowledge is constructed and learners need to be more engaged in the learning process. Therefore, environments that are conducive to learners being able to manipulate and explore are more conducive to constructivist activities and learning. Coffman and Klinger (2007) suggest that being immersed in an environment that supports creativity and discovery provides a better means for students to transfer their knowledge to real-world applications. Also, Barab et al. (2000) cite that many learning environments are becoming more collaborative in nature. Therefore, technology incorporated into a curriculum should engage students in the learning process, allow students to experiment and explore so as to construct their own knowledge, and provide an adequate platform for rich communication and cooperation to take place. Johnson and Levine (2008) have noted that virtual world environments provide platforms for rich expressions as well as social interactions.

3-D virtual world environments may prove to enhance existing technologies’ capabilities to better achieve these goals. The environments offer abilities to communicate and collaborate with others in a shared virtual space that is created by the users and foster potential for educational and cooperative activities. Typically, the virtual environments are created by the users. These capabilities afford new opportunities for creativity to abound and for idea generation and experimentation to flourish. Users can learn through their own discovery processes, as well as learn through their interactions and collaborative efforts with others.

Accounts of educational applications of virtual worlds provide insights into various opportunities that exist and are being realized, along with issues that have been encountered. This article addresses these applications and opportunities by focusing on 3-D virtual world environments in educational contexts. Specifically, this article reviews the literature that addresses current applications, benefits, and issues of virtual worlds in education, then summarizes opportunities and gaps of these virtual worlds for consideration in education, and highlights implications for both practice and research.

3-D VIRTUAL WORLDS IN EDUCATION

Educational institutions continually explore new opportunities to bring the classroom online as technology continues to grow in sophistication and capabilities (Erickson & Siau, 2003). Some pursue this endeavor to create greater opportunities to reach students through distance education programs. However, some have extended this concept of using Internet-based technologies to teach by creating more sophisticated virtual realities or virtual worlds to expand on the interaction that takes place among students as well as with