

Issues and Concerns of K-12 Educators on 3-D Multi-User Virtual Environments in Formal Classroom Settings

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ABSTRACT

This study is a naturalistic inquiry conducted between 2007 and 2009 that presents emergent themes from interviews with fourteen K-12 educators and administrators regarding their issues and concerns about implementing 3-D multi-user virtual environments in formal K-12 classrooms. The major issues and concerns emerging from interviews included instructional effectiveness, security, bandwidth, and technology. The majority of the participants at the end of the study could not overcome one or more of these issues or concerns to use virtual environments in their classrooms.

Keywords: *Classroom Integration, K-12, Multi-User Virtual Environments, Technology Adoption, Virtual Learning Environments*

INTRODUCTION

Three-dimensional (3-D) multi-user virtual environments (MUEs) have the potential to provide students with educational resources that are stimulating, appealing, easy to use, and educationally sound, without the need to develop elaborate technical skills (Jones, Morales, & Knezek, 2005). Proponents suggest that such technologies will appeal to future user populations when used for presentations and to add complexity to learning contexts

(Abram & Luther, 2004; Branston, 2006; Dedde, 2005). Examples of 3-D MUEs include *Second Life* (Linden Labs, 2003), *World of Warcraft* (Blizzard, 2007; Dickey, 2007), ActiveWorlds (Mauz, 2001), AET Zone (Cox, 2006), Quest Atlantis (Barab, 2009), River City (Dede, 2009), Created Realities Group VXi system (CRG, 2005), and many others. All of these, in one form or another, have been used for instruction or to support learning in both formal and informal K-12 education settings. Such environments when compared to web and text-based methods for instructional content delivery, show improved facilitation of student interactions, increases in student engagement,

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and have been noted to foster deeper learning (Jones, Warren, & Roberston, 2009).

Despite the proposed benefits of MUEs, adoption of this approach or other similar games and simulations technology has been slow (Gilbert, 1996; Prensky, 2006; Taylor & Chyung, 2008). MUEs can be found in both formal and informal educational settings. Many of the platforms mentioned earlier have published research in one or both educational settings. For example, Quest Atlantis conducted research into informal use with Boys and Girls Clubs (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005) prior to implementation in formal classrooms settings (Barab et al., 2007).

This study focuses on issues and concerns about the use of MUEs from the perspectives of two sets of primary stakeholders: educators and administrators. The primary purpose of this study was to understand and illuminate the barriers to the use and implementation of 3-D multi-user virtual environments in formal classroom settings. The research presented in this study does not examine the specific issues of informal versus formal learning use, although the reader may draw conclusions from the themes that emerged as they seek to design and implement 3-D environments in educational settings.

MUEs, LEARNING, AND EDUCATIONAL TECHNOLOGY

MUEs today can be classified into two broad categories: Direct Instruction MUEs and Social Constructivist MUEs. As will be discussed, each type has inherent design approaches that impact how it would be used in a classroom or curriculum. It is important to note that nearly all participants in this research were involved or examining what we have defined as social constructivist environments or attempting to use social-based systems to attempt to deliver direct instruction. Throughout the 1990s and 2000s, MUEs that were designed to deliver direct instruction were not common, though some like River City, Quest Atlantis, and the

Genome Project in Second Life were introduced to small populations for pilot research.

The inclusion of innovative technologies in schools has long been a challenge in educational spaces with Cuban (1988) noting troubles with teachers having high access to computers and other forms of instruction technology ranging from the 1980s through the early part of the 2000s (Cuban, Kirkpatrick, & Peck, 2001). During this time, a debate simmered between those that believed that media would never influence learning (Clark, 1983, 1994) and those that believed it has the capacity to transform it (Kozma, 1991, 1994).

Direct Instruction MUEs

While for some, the Clark/Kozma debate remains unsettled, the question has myriad implications for multi-user virtual environments. This mainly stems from their heavy dependence on the use of multiple media (e.g. audio, video, text, interactivity) as a means of conveying objective knowledge in designs built from an Empirical/Positivist perspective (Bernstein, 1983). Therefore, if Clark is correct, media can *never directly influence* learning; instead, it is the instructional method that is always responsible. Any media depictions then simply act as replacements for what normally exists in a face-to-face classroom such as a teacher lecture, independent collaboration amongst students, or other learning activities. Thus, a digital video of a teacher providing instruction is cognitively no different from a teacher in a classroom providing direct instruction, except for the loss of physical presence and rapport that emerges through body language and eye contact. Media act as simulacra of classroom instruction or learning activities; therefore, the digital medium itself does not directly impact learning.

From Clark's argument, an instructional designer's argument supporting the idea that media can, in any way impact learning, must be made more circuitously. Here, there is not direct impact. Instead, the impact of media is indirect, influencing affective and cognitive components

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