Efficacies of 3D Immersive Virtual World Classrooms

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Abstract. Virtual 3D immersive virtual environments are no longer novel, with current college freshmen having grown up with virtual gaming environments. Implementing virtual world classrooms, complete with student and teacher avatars, is increasingly achievable by individual teachers. Virtual world classrooms match the effectiveness of traditional classrooms while brining an up-to-date element into the class and satisfying increasing demands for distance learning. Hotel tourism management is a good example of how virtual worlds can give students opportunities not possible in the physical classroom—allowing students to receive both lectures and perform simulations. The question addressed in this study is what are the personal experiences of mainstream students and teachers when attempting to execute and participate in such a virtual world class? Using an action research approach, we developed a rich description of student and teacher efficacy toward a virtual world 3D immersive classroom. Findings describe four main categories of student reactions: Dialogue, Convenience, Technology, and Motivation. Content analysis describes the positive and negative experiences as well as feelings that make up these categories. The specific benefits and challenges of a virtual world classroom are described, informing teachers considering adopting a virtual world classroom.

Keywords: 3D simulation · Efficacy · English as a foreign language · Hotel and tourism management · Technology training · Virtual world

1 Introduction

Role playing is quite suitable for skill obtainment in applied fields, such as tourism management (difficult to enact in a traditional classroom). Beyond skill obtainment, teachers can better capture student attention and increase motivation by employing tools college age students are quite familiar with. Growing up with massively multiplayer online role-playing games (MMORPG) entertainment, today's college student is well experienced with 3D virtual worlds, where social interaction, through abstract representations of self, is quite normal. Implementing such an approach, however,

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within a university teaching environment falls outside of the normal gaming realm students have experienced. How students react to the mixture virtual worlds with class exercises and goals comprises the student-focused track of research addressed in this study.

2 Literature Review

Learning in virtual environments, even simple settings, has been found to result in equivalent learning rates compared to real-world classroom settings. Student academic achievement within a virtual world is on par with students in traditional lecture settings, even for demanding engineering classes (Okutsu et al. 2012). Simply being able to manipulate objects within a basic virtual world helps students improve skills (Pasqualotti and Freitas 2002). Feelings of presence in a virtual world do not lead to better or increased learning, but learning is not significantly worse than in physical classrooms (Persky et al. 2009), while feelings of engagement are increased as participants collaborate in ways constrained by physical school settings. Traditional classrooms make realistic role playing nearly impossible, especially for large class size. Cultural conventions can also make role playing difficult in settings where students feel loss of face or are discouraged from self expression. It is because of this ability to overcome geographic constraints and simulate non-classroom settings that teachers have adopted Second Life for simulations, such as business settings (Jin 2009).

Hospitality/Tourism Management (HTM) curriculums are heterogeneous across universities (Scott et al. 2008; Stergiou et al. 2008). One of the few commonalities, however, is an emphasis on introduction to industry standards through observation and internships. In general, HTM education is preparing students for employment in a field that is itself undergoing rapid and significant disintermediation from technology. Busby and Huang (2011) emphasized the importance of at least assuring students understand the context of these changes, i.e., technology. Virtualization of many aspects of the HTM industry has already occurred. As early as 1995, Williams and Hobson (1995) point out the opportunity for VR in tourism, emphasizing the core value of tourism is the experience, which VR can produce with increasing fidelity. Additionally, virtual augmentation is leading the way in reducing unnecessary travel, improving efficiency, and adding to travel experiences, such as Google, Bing Maps and Google Glass. Even if virtual reality is not replacing tourism, it is increasingly playing a role in consumer search and evaluation, meaning increased experience with virtual tools will improve students' job preparedness for the HTM industry.

3 Methodology

The current research frame focuses on student experience of a virtual world class, through their own voices over a semester. An existing tourism class, in an applied foreign language department, is the setting for this study. The undergraduate elective class focuses on English used in the tourism/management industry, along with concepts of tourism management and key attributes of service, such as hotel room types,

customer complaints, and destination attractions. Class enrollment included 89 students (self-selected convenience sample). Valid responses included 74 students: 60 females and 14 males, with an average age of 20.47. The virtual world used for class meetings is Open Wonderland. The NVIVO software package is used for analysis and categorization of the grounded theory approach.

4 Results

Checking on the overall effectiveness of the virtual world and students' participation in it, a survey is administered to measure feelings of presence. For the survey questions concerning the feeling of presence, we employ the 7-item telepresence scale. Respondents indicated agreement with statements along a 1 to 7 scale, with 7 = agree very strongly and 1 = disagree very strongly.

The survey was administered twice in the semester, once after the second virtual world experience and then after the final virtual world meeting. The seven questions exhibited a high reliability (Cronbach's Alpha = 0.88). A t-test between the two survey results shows no statistically significant changes across the semester, with feelings of presence, showing a consistent experience. Table 1 reports the overall mean values of the two surveys, showing students felt a moderate level of presence.

Table 1. Feelings of presence during data collection period

Variable	Mean	Std dev
(A1) During the class, I felt I was in the world the computer created	3.49	1.20
(A2) During the class. I forgot that I was in the middle of a trial	3.80	1.53
(A3) During the class, my body was in the room, but my mind was inside the world created by the computer	3.19	1.17
(A4) The SIM world seemed to me "somewhere I visited" rather than "something I saw"	3.14	1.25
(A5) I felt I was more in the "SIM world" than the "real world" around me when I was doing the exercise in class	3.24	1.37
(A6) I forgot about my immediate surroundings when I was navigating through the SIM location	2.92	1.35

5 Discussion

Students are impressed with the opportunities for dialogue within a virtual world. Combining foreign language learning and professional topics (English for Specific Purposes) works well in cultural locations where self-expression in traditional classrooms is discouraged (Chen et al. 2011). It is not a coincidence that the social aspects of MOORPG are valued by students, since this is a key aspect of online gaming success, with games like World of Warcraft, attracting groups of players, called guilds (Chen et al. 2008). Introducing the social communication aspect of MOORPGs into a

class with a communication aspect has clear advantages appreciated by students in this study. Simulating actions, such as hotel management, is simply impossible in the classroom setting, leading students to express excitement over the vividness of the virtual world.

6 Conclusion

Many schools are facing pressures to expand their online educational opportunities. Virtual worlds present an excellent opportunity to retain many of the benefits of classroom interaction, on the job training, and distance learning.

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