The Mean Business of Second Life: Teaching Entrepreneurship, Technology and e-Commerce in Immersive Environments

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Abstract

Second Life is a three-dimensional multi-user virtual environment with a vibrant economy, where avatars (virtual representations of users) can engage in innovative and unique business and collaborative activities. The immersive nature of this application creates ample authentic opportunities for teaching entrepreneurship, technology and e-commerce.

This article describes a Masters of Business Administration elective course, in which Second Life was utilized to teach strategic and managerial issues related to e-commerce. The collected data indicate that the students in this course experienced a steep learning curve with regards to the complicated interface of Second Life, its complex social canvas and non-traditional framing of teaching and learning. The article discusses an array of pedagogical issues to be considered in the design and development of an immersive course.

Keywords: e-commerce, virtual worlds, business education, immersive environments, learning activities.

Introduction

Virtual worlds and their implications for teaching and learning have been the source of thought-provoking conversations in academia (Bronack, Riedl & Tashner, 2005; Bronack, Riedl & Tashner, 2006; Dickey, 2005). It has been suggested that virtual worlds have the potential to generate rich content and sustain meaningful connections to and between people, places and events, bring together space and context and transform the ways in which people work and learn (Johnson, 2008). Second Life (SL) is one instance of a well-recognized virtual world that currently boasts more than 15 million accounts and is marked by the presence of a strong educational community. In fact, the New Media Consortium that leads the largest educational project in this virtual environment has been supported by hundreds of real life educational institutions and over 7,500 educators and students.

SL is a persistent virtual environment, where virtual representations of users known as resident avatars imagine, define and create their settings, engage in creative activities, organize events and grow networks.

In SL, residents can build and manipulate objects and engage in diverse educational, social and commercial activities. The three-dimensional quality of this medium changes the scope and richness of such activities in that it "…extends our notions of the real world, just as the web extends our notions of the network… (it) allows the visualization of ideas and concepts in three dimensions that is leading to new insights and deeper learning…allowing people to work, learn, conduct business, shop and interact in ways that promise to re-define how we think about these activities – and even what we regard as possible" (Johnson, 2008).

The vibrant character of this environment offers particularly attractive opportunities for teaching business-related concepts. SL is designed as a self-contained economy, complete with its own currency and currency exchange, the LindeX. Business activity is thriving and growing with residents retaining intellectual property rights to the items they create. A resident can build a virtual object like a chair, sell it to other residents, and invest the earnings in a new accessory for her avatar. In addition, because residents can convert their Linden dollars to real world currency, they make real world profits from their SL activities. In other words, entrepreneurs can start and run virtual businesses in a manner quite similar to the way people engage in business in the real world. A unique virtual environment, where entrepreneurship is so readily on display, SL might become a useful tool for exposing students to business and e-commerce concepts.

Engagement Through Immersion and Presence

Bowman and McMahan (2007) define virtual environments as"…complex technologies that replaced real-word sensory information with synthetic stimuli, such as 3D visual imagery, spatialized sound and force or tactile feedback. The goal of immersive virtual environments was to let the user experience a computer-generated world as if it were real – producing a sense of presence, or "being there", in the user's mind" (Bowman, McMahan, 2007, 2).

Slater (2003) differentiates immersion from presence and describes immersion as objective and measurable, whereas presence is context-dependent. In other words, immersion relies on technical capabilities of virtual reality technologies to render sensory stimuli (realism of environmental settings, display size, display resolution, etc.), whereas presence draws from the individual's subjective psychological response to virtual reality and depends on a range of factors including an individual's state of mind. The emergent complexity of virtual environments is particularly shaped by the notion of presence, both spatial and psychological, which motivates users to participate in role-playing, socializing, building and business activities (Castranova, 2005).

Educational uses of SL have largely depended on the creation of a sense of presence in students and provision of meaningful and enriching learning experiences. For instance, the Harvard Extension Program uses SL to present mock trials, where avatars are invited to attend, observe and even serve on the jury. Sarah Robins "Intellagirl" exposes student assumptions and stereotypes through carefully designed learning activities that allow stepping into the shoes of other people (Robbins, 2008). Mary McAleer Balkun from Seton Hall University encourages her students to design and build virtual representations of the objects from the class texts and thus reveal their own interpretations of American Literature (Balkun, 2008). This kind of participation and engagement shapes the emotional connection of users to the content, events and people and supports building knowledge through purposeful interaction.

The instructor of the MBA course described in this paper used SL to create this sense of presence in an active economy in order to evoke student engagement and strong interest in the subject matter, e-commerce and entrepreneurship.

Course Background

The course is an elective in the MBA program and focuses on the topic of electronic commerce (i.e., e-commerce). E-commerce is an umbrella concept that brings together a number of different organizational functions such as marketing, management, supply chain, and information systems and

includes notions related to the consumer purchasing process, the characteristics of products and services, markets and economies, the role of human behavior, and the entrepreneurial process.

The course is typically taught to demonstrate organizational and contextual factors that influence the environment in which e-commerce systems operate. Students learn by engaging in hands-on experiential activities that involve real-life problems as presented by business leaders and entrepreneurs.

SL offered a unique environment to facilitate such interaction, because students could engage with businesses, and observe successful in-world (i.e. in the SL world) entrepreneurs as the latter eagerly shared their professional experiences.

Students in the course came from one of three programs at the university: the MBA program, the MS in Information Systems program, or the Human Computer Interaction program. Several students participated in the course from a distance (e.g., one student was from Dubai) while others participated by attending lectures in the studio classroom. All lectures were streamed to online students who could watch and participate synchronously or watch the recordings of the lectures at a later time. Streaming content and recordings were captured and delivered using Adobe® Acrobat® Connect™, a multimedia web conferencing and eLearning software package that supports audio, video, discussions boards and application sharing.

Conceptualizing a virtual course

The instructor was first exposed to SL in the fall of 2006 and initially approached it as a research topic. The professor soon realized that one of the most prominent user groups in SL were educators. As a result, he determined that SL would be part of future courses where the capabilities of SL fit the course content. The first venture into using SL occurred in the shape of an unstructured course assignment where students were asked to explore the features of SL, understand its culture and economy and develop a business model and plan for a SL business. Students were encouraged to create their accounts and enter the environment, but could also learn about entrepreneurship and business activities in-world using web-based searches and other methods of research. The results were encouraging because students reported that it was an enjoyable experience and that they thought that the environment was useful for teaching some of the concepts that related to the course. Nevertheless, the unstructured project that consisted of essentially turning students loose for independent exploration limited the ability of the instructor to manage learning and teaching effectively.

Based on experiences gained from this initial, exploratory use, the instructor decided to incorporate SL into the graduate-level e-commerce course, add greater structure to the learning process and employ SL not only as a focal point for course content but also a tool for delivering course content. With regards to this last point, the instructor recognized that SL might serve as an effective tool for communication because it allowed students to interact with him and others as well as the guest lecturers in a flexible, interactive, and engaging manner. As a consequence, the graduate-level e-commerce course was designed to immerse students by not only designing the course content around the SL culture, environment and people, but also by using SL as a virtual classroom to facilitate communication, learning and exploration (e.g., guest speakers spoke about SL culture, businesses and history, the course project involved the question of whether a non-profit organization should use SL for fund raising, etc.).

Structuring a virtual course

Developing and delivering a course using a virtual environment requires a considerable investment in planning, design, and development. At this university, no other instructor, department, or college had used SL or any similar virtual environment for course delivery, so this course was essentially designed and built from the ground up. As such, numerous components needed to be put in place to develop the course.

First, the course could not be delivered without the assistance of professional support staff and a sponsoring university entity. In this case, the instructor held an organizational meeting with staff several months prior to the delivery of the e-commerce course to lay out the plans and solicit support. Staff from

the university's Center for Excellence in Learning and Teaching volunteered to assist in the course design and development. Furthermore, the administrator of the distance education group from the College of Engineering agreed to purchase a SL island and provide student support in building facilities on this virtual space. Once the commitments and support had been garnered, the instructor needed to develop the content. This included not only the conceptual content associated with the course, but also the infrastructure to support students within SL. In this case, because the course was designed to focus on e-commerce as it existed in virtual worlds like SL and the course was to be delivered to introduce communication capabilities of SL, both the course content and classroom infrastructure needed to be developed. Both of these endeavors required considerable planning and forethought. For example, in the case of course content, the instructor needed to identify a target organization that could provide a problem to be addressed as a class project. Furthermore, guest speakers who could provide students with information about the SL environment needed to be identified, solicited and scheduled. Each of these activities required a considerable investment in time and energy on the part of the instructor and support staff.

Similarly, the development of the SL island infrastructure required considerable planning and development long before the course was delivered. The immersive nature of the course required the instructor to design and build resources within the virtual space to accommodate classroom lectures, course exercises, and team activities. For example, it was necessary to develop a classroom facility, build project activity spaces, position instructions on the island, and design and test meeting rooms. While the instructor was experienced in using many SL features, self-training was required on how to build complex structures, code scripts and conceptualize and plan how space would be utilized during various classroom activities.

Since no students had experienced SL prior to the course and only a few students had participated in video games or other environments even remotely similar to SL, considerable effort was needed to guide students. For example, students needed to set up a SL account and go through orientation island, and thus be ready for the first official component of the course. As a result, the instructor alerted students to the need to sign up for a SL account well in advance of the course's starting date.

In addition, the instructor needed to orient students to the SL environment. In this case, orientation was accomplished using two techniques. First, a show and tell video was produced demonstrating how to sign up for an account, perform basic functions, and travel to the virtual classroom space. This video was useful because not all students would be able to attend orientation sessions, some might sign up for the course late and others might want to have a resource they could refer to at a later time. Second, orientation sessions had to be offered to familiarize students with the environment, answer questions to provide targeted assistance and discuss the purpose and goals of SL for this course.

Learning Activities

A chain of learning activities was developed to both gradually introduce student-users to the virtual world of SL and prompt meaningful learning of business concepts via a scavenger hunt, a series of SL guest speaker presentations and a course final project.

The goal of the scavenger hunt activity was to help students co-experience and explore SL as they were sent on a mission to discover interesting places and learn basic SL skills. Six locations were introduced in the broader SL context (i.e., outside of the instructor's controlled educational facility), which were cultural or historical venues that represented exemplary uses of SL. To complete the exercise, students needed to retrieve the instructions, decipher the embedded hints and teleport to the location where the item they were searching for was located. This exercise had to be completed as a team and required that students coordinate their activities, communicate effectively and collaborate in the process. Successful completion was achieved when the team leader submitted a note card that contained details of the team's collaboration as outlined in the Scavenger Hunt instructions. Additionally, each student was requested to write a reflective essay answering several questions which probed into their experiences during this adventure.

The professor and the support staff identified guest speakers, vetted them for their suitability for the course, made formal invitations, arranged the logistics for their visits and facilitated presentations. The guest speakers ranged from a SL small business entrepreneur to an educational consultant to a

representative from the IBM Corporation. Each of the eight speakers delivered a short lecture in SL through voice streaming, showcasing their products and services and accepted questions from students.

Lastly, the students were required to prepare an in-depth final report for a local non-profit organization which was interested in the potential of SL to facilitate their outreach and awareness initiatives. This project required that students consider more than mere technical or parochial characteristics of SL, but also examine deeper-level issues such as strategic alignment, risk, brand/image management, etc.

Research Data and Analysis

Twenty-nine graduate students participated in this study. Collected data included two sets: student guided reflections completed after the scavenger hunt activity and responses to the PlusDelta surveys. Instructions for guided reflections contained questions that probed into student personal and team experiences of the scavenger hunt. PlusDelta surveys inquired how the use of SL enhanced or impeded student learning in this course.

This study used a constant comparative method (Ragin, 1987) to code the data into themes, then in categories and finally into concluding results. Coding was first analyzed within each individual student reflection piece and then across the entire reflection data as a whole. Before coding the raw reflection data, coding rules were operationalized as suggested by Holsti (1969).

The research problem was defined in terms of positive and negative statements expressed in the reflection data. The unit of analysis was a complete statement. Conjunctions (i.e. and, but, for, or, yet) were used as dividing points to separate phrases into one complete statement. The system of enumeration was based on positive or negative statements about the SL experience. Positive descriptors toward the technology included words such as "easy, good, helpful, intuitive, rich, productive, simple or useful." Negative descriptors toward the technology included words such as "annoying, distracting, frustrating, high learning curve, overkill, problems, or slow."

Positive statements about SL resulted in distinct themes such as: group meetings, quality communication, individual expression, interesting environment, nonverbal communication, group exploration, community connection, fun environment, and sense of team. Negative statements about SL resulted in distinct themes such as: chat screen lagged, too complex for simple chat, steep learning curve, high demand for system resources, limited chat features, high technical requirements, avatar did not enhance chat, environment distracting, and other avatars might interrupt. Within these positive and negative themes, two major categories emerged to describe the SL experience – educational and technological.

Steep Learning Curve

Students emphasized experiencing a steep learning curve focusing, in particular, on: (a) the complicated interface of SL, (b) its complex social canvas and (c) non-traditional framing of teaching and learning.

Complicated interface

All students were closely mentored during the process of setting up their SL accounts. They were sent detailed instructions accompanied by video explanations prior to creating avatars. The instructor added every student to the list of contacts and demonstrated the basics of navigating and building. The support staff members were readily available to assist with advanced actions, such as editing avatar appearances, sorting out inventories, taking snapshots, etc.

Additionally, groups of students were sent on a Scavenger Hunt to discover interesting locations in SL and practice basic technological skills, as outlined in this example: "One of the most famous buildings of SL is Governor Linden's Mansion. Find it using search in-world (click "Search" on the bottom of the viewer, select places and enter "governor" as a keyword). Or tp (teleport) each other once you find the mansion. Look around to find your way to the basement (hint: it is close to the aquarium by the down arrow). Find a time capsule in the basement that was buried in 2003. It reads "Don't open until…". When will capsule be open?" In this challenge the students not only were shown a historic place in SL, but also

encouraged to use the search tool and practice moving and zooming in on objects as well as collaborate effectively with all team members.

Students reported being overwhelmed with the complexity of the interface of the SL viewer. Because students were charged with sophisticated assignments, they felt they were pushed to examine the interface of SL more carefully. Even with instructions clearly posted on the walls of structures throughout the island and extra help available from experienced users, these students expressed their frustration with the clutter of the 3-D scene, such as numbers, texts, glyphs and a plethora of options and settings.

One student recollected that "... I spent forever trying to figure out where to go. It wasn't until I realized that I just needed to spin my avatar around until I saw stairs, did I know what to do. It took the enjoyment out of SL. It was like being in Stat class with Jump – okay, answer the question using Jump, only we aren't going to tell you how to use to Jump. You just have to get the right answer for the test." This student equated struggling with the SL interface to taking a test in the statistics class, meaning the student knew there should be ways to navigate in this environment, but the visual clutter was very confusing even after much practice. This is obvious in the comment of one student: "SL made me spend too much time to get familiar with the interface of this software and the complex operations [it requires]". Yet another learner remarked that "The learning curve so steep, that [I felt] this tool was not second nature [for users]."

SL communication modes were perceived as a serious obstacle. Students were confused by the large number of messages appearing in local and group chat in addition to instant messaging (an exemplary comment came from one learner who was upset by "…the enormous amount of content to review and see which was quite distracting at times"). Others were dissatisfied with the lack of the group discussion organization. Although all guest speakers used audio, the questions from students came via a group chat. The chat log often grew very complicated when interjected with numerous comments by student avatars. While the spontaneity of such group discussions was appreciated by some, others felt lost having several chat windows open and thus adding up to information clutter.

Complex social nature

The complex social nature of SL presented another challenge as guest speakers unveiled how their businesses operated in-world. Initially, students felt very skeptical about other people investing time and resources into SL. Because this medium was at first perceived by students as a game with graphics that "…were behind their time" (as noted by one of them), the students were not sure if others might seriously engage in-world.

But as a DJ talked about hosting Friday disco parties to raise awareness about cancer research, an educational consultant discussed the mission of his enterprise to enhance teaching and learning through meaningful uses of SL, and an IBM representative eloquently spoke about promoting her company through SL activities and events (one student reported that the IBM representative's lecture was more eye-opening for me, coming from a corporate environment."), students came to see this medium as a platform for active social life and networking.

Several students pointed out that "… [from these presentations] some of the basic principles are common to business practices both in RL (Real Life) and SL. People get connected to each other and interact with the help of their avatars and they have to follow some business rules in order to attract customers which is almost the same as getting customers in real life just because even though they seem to be avatars, yet behind each is a real person who would deal and feel things the same way as he does in real life. I learned a lot about the activities and business processes in SL after attending different interactive discussions with people in SL which helped me learn about how the business processes took place in SL, the basic idea behind which is same as that of any business in real world."

The speakers' presentations also helped to reinforce the idea that businesses flourish in SL because of the rich and complex social canvas that sets this medium apart from an electronic game. Unlike a game, this environment emerged more complex and involved unlimited by pre-defined goals and objectives. Making parallels between human and economic processes between real and SL worlds required sophisticated intellectual efforts from students as this response indicated: "I originally thought that SL was a worthless online environment. While I do play video games, I did not see the diverse community that is present in SL. Upon seeing what SL is and what it is all about, I now see that there can be fun

and possibly some benefit to being active in the online community such as SL." Another response indicated that the holistic picture of SL as an online community with full-fledged social and economic interactions painted in this course pushed this respondent to extend and explore new boundaries in e-commerce.

Alongside with student maturing understanding of the social canvas of SL, there arose concerns about adult content. Although all learning activities occurred on the island that disallowed access to those not associated with the course, the instructor warned the students about the risk of exposure to adult content when they were exploring the virtual world of SL. The students were strongly recommended to exit the application should such an exposure accidentally happen. One student articulated that "…as [I] explored the world I was very tentative about talking to people, so I know I did not reap the benefits of the social networking aspect. I was always afraid of finding things in world that I don't want to be exposed to." Another student fiercely disagreed by pointing out that most of exploration that happened in class was limited to sterile sites: "There is an enormous amount of mature content and its impact on e-commerce, modern sociology and communication studies can be overlooked if one is not willing to at least consider exploring some of the more mature facets of SL's use. It would have been especially interesting learning more about how, as a social tool, SL circumvents conventional wisdom about disabilities, beauty and societal taboos. It would have been even better to incorporate more social context into the use of this tool."

Non-traditional framing of teaching and learning

In the virtual world of SL students were pushed outside of their traditional framework of teaching and learning, out of the brick walls of their auditoriums into out of the ordinary learning spaces. The professor who created the majority of structures for teaching and learning on the island departed from the idea of replicating the psychical world, but rather devised large open spaces that emphasized the uniqueness of this online environment. The classroom was located on top of a mountain and had a convenient speaker podium and plenty of seating capacity for the audience. The team spaces were floating in the air thus allowing groups of students to engage in conversations without being interrupted by other avatars. The rotunda with teleportation signs in the middle of the island functioned as an easy, one-click access to any learning space.

While mesmerized by the unusual academic settings in which learning and teaching were framed, students quickly brought up the distractions that came with it. Several respondents were disappointed with classmates manipulating objects from their inventories during the classroom discussions. One of them admitted to experimenting with SL features on several occasions and not paying much attention to both guest speakers and classroom discussions.

Second Life Potential from Student Perspective

Despite the challenges faced by the steep learning curve of the SL interface and virtual culture, student reflection pieces also spoke to the rich potential they saw in this new environment. When writing of the learning environment, one student noted that, "I learned much more from building and exploring than I would have learned from a standard lecture format." In this statement, the use of active verbs such as building and exploring suggested that this student felt more engaged with the virtual activities than a traditional university lecture. Many students mentioned the potential of SL in team development and collaboration activities. One student wrote, "SL really allowed us to create a sense of team, something that develops fairly naturally in face-to-face class meetings." Another student echoed this feeling of virtual closeness by stating that, "Having an avatar involved during the chat made the experience seem more human or real, even though it is still virtual communication." Finally, in their reflections these students spoke of the potential of SL to connect globally with business experts. As one student wrote, "I really liked the opportunity that SL offered to us to get specialists from any place in the world to come and speak to us in the classroom."

Second Life Potential from Instructor Perspective

The instructor identified several benefits and opportunities for using SL for teaching and learning. First, SL has great potential as a tool to support distance education. The course described in this paper was conducted in a blended mode. One of the observations that the instructor made was that SL leveled the

playing field for all students and gave members of distributed teams the opportunity to function at the same level and use the same set of tools. As a result, SL has a great potential to foster team development and cohesiveness in situations when team members are not collocated. This represents one of the broadly applicable benefits of SL; that is, the support of team communication and collaboration. While the learning curve for SL was an impediment for some students, the conclusion that the instructor arrived at was that the net benefit significantly outweighed the costs to both the instructor (i.e., in preparation) and students (i.e., in learning to use the platform).

A second benefit of using SL is that it could be used to expose students to a vibrant and active economic and business environment that allowed students to immerse themselves in the concepts and activities that were relevant to the course content. For example, students were able to not only dialog with SL guest speakers, but also speakers could bring up objects to illustrate a point or take students on a field trip to see a site or object. In addition, students had the opportunity to explore the broader SL environment and experience the good, the bad, and the ugly side of it. SL is, for lack of a better term, a microcosmic simulator of human behavior. As such, noble and virtuous components of human expression are displayed in museums, fund raising ventures, creative and aesthetically pleasing buildings and structures, and other beautiful and socially responsible endeavors. On the other hand, SL also puts on display expressions of questionable behavior, violence, hatred, antisocial behavior, and bigotry with, for example, the random acts of grievers who disrupt events or deface properties. A distinct advantage of SL for education is that both these seedy expressions of human behavior as well as the noble can be experienced with little effort, with only a slight amount of risk, and with a high degree of relevance. As such, the word simulator is apropos because it allows the instructor to expose students to simulations that are both quite realistic but also quite harmless.

Yet another benefit gleaned by the instructor is that the rich and interactive nature of SL creates a learning experience that is exciting and engaging. One of the challenges in education is to engage students in learning activities, lectures, and dialogs that are enriching, interesting, and, at the same time, educational. Students are increasingly expecting and in some cases demanding greater relevance and vibrancy in their educational experiences. Traditional lectures that use a push mode of learning will likely continue to decrease in effectiveness as an increasing number of students arrives in the classroom with a plugged-in view of the world. For many students today the perspective is becoming more common that if it's not on Facebook, Twitter, or YouTube, perhaps it is not worth knowing. As a vibrant social network that engages students not merely with facts and figures, but with facts and figures embodied in personas and actions, SL creates a learning space that will increasingly be useful for engaging a new generation of students

Immersion and Presence - Are We There Yet?

The above-described course attempted to stimulate student engagement with the subject matter through immersion and presence. From the careful analysis of available data, the authors arrived at the conclusion that students experienced immersion in this course rather than presence. Although a steep learning curve was largely attributed to the complicated SL interface, students felt capable to master SL technicalities even if gradually. A plugged-in generation, they deemed themselves capable of figuring out the subtleties of the SL viewer. They also appreciated the spatial character of SL 3-D scenes, in which they were immersed unlike 2-D projections of the environments commonly used in academia (i.e. pictures in the books). Visual stimuli afforded by the virtual world of SL equally contributed to student engagement. Finally, because the nature of course content was ultimately different when presented through the lens of SL, the learners reported developing awareness of the kind of information that normally goes unnoticed.

However, immersed in SL, students did not display intense signs of presence. The feeling of being there, in this case, was not developed, partially due to the short duration of the course (six weeks), and partially because this course did not specifically focus on enabling presence. Presence takes time and effort as an individual chooses to become involved with the SL community and depends on a variety of subjective psychological factors. For this course the feeling could have influenced the effectiveness of student learning. On the other side, intense presence might have been distracting learners from an unbiased evaluation of the economic processes of SL. To assess this hypothesis, the instructor designed a slip-on avatar course the following semester, in which fully configured and ready-to-go slip-on avatars were

distributed to students. The research findings from the slip-on avatar course will be disseminated in a separate paper.

General Recommendations for Developing an Immersive Course

- Seek out and make use of existing teaching and technology support structures within the university.

- An instructor will be more successful with the assistance from professional support staff.

- Administrators' support is essential.

- When introducing a virtual world into a course for the first time, budget considerable time for planning, design, and implementation of course content and infrastructure.

- An instructor will be more successful when an investment is made in planning and designing how a virtual world's content will be meshed with the course content.

- It is important to orient students in their exploration of a virtual world.

- Students will benefit from an advanced notice of the use of a virtual world in the course.

- Students must be provided tools to support their immersion in a virtual world.

- An instructor must invest in planning and designing infrastructure to use a virtual world for teaching and learning.

References

Balkun, M.A. (2008). Exploring student engagement through virtual worlds. Presentation at EDUCAUSE ELI meeting, January 28-30. San Antonio, TX.

Bowman, D. A. & McMahan, R. P. (2008): Virtual reality: How much immersion is enough? IEEE Computer, 40(7), 36-43.

Bronack, S., Riedl, R., & Tashner, J. (2005). Innovation in Learning: Assumptions about teaching in a 3D virtual world. Book of Proceedings –International Conference on College Teaching Methods and Styles, Reno, Nevada.

Bronack, S., Riedl, R., & Tashner, J. (2006). Learning in the zone: A social constructivist framework for distance education in a 3D virtual world. Book of Proceedings – Society for Information and Teacher Education, Orlando, FL.

Castronova, E. (2005). Synthetic worlds: the business and culture of online games. Chicago: University of Chicago Press.

Dickey, M. D. (2005). Three-dimensional virtual worlds and distance learning: two case studies of Active Worlds as a medium for distance education. British Journal of Educational Technology, 36(3), 439-451.

Holsti, O. R. (1969) Content analysis for the social sciences and humanities. Reading, MA: Addison-Wesley Pub. Co.

Jonson, L. (2008). Online virtual worlds: Applications and avatars in a user-generated medium. Testimony in the U.S. House of Representatives, April 1. Last retrieved May 25, 2008 from http://energycommerce.house.gov/cmte_mtgs/110-ti-hrg.040108.Johnson-testimony.pdf

Ragin, C. C. (1987) The comparative method: moving beyond qualitative and quantitative strategies. Berkeley, CA: University of California Press.

Robins, S.S. (2008). Virtual worlds as Web 2.0 learning spaces. Presentation at EDUCAUSE ELI meeting, January 28-30. San Antonio, TX.

Slater, M. (2003). A note on presence technology. Presence-Connect, January 2003. Last retrieved May, 28 from http://presence.cs.ucl.ac.uk/presenceconnect/articles/Jan2003/melslaterJan27200391557/melslaterJan27200391557.html

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