The Path from First to Second Life

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Abstract: This paper discusses the use of Second Life as an educational tool in higher education. It focuses on the ways educational institutions use this virtual environment, the types of spaces educational institutions are creating or simulating, and the types of activities being conducted in the virtual environment. It also presents lots of examples of Second Life uses by universities and reviews the most important findings in literature on the strengths and weaknesses of Second Life. Recommendations on effective use of Second Life and design are also provided.

Introduction

Although there is expansive literature on the current Web 2.0 tools, the literature focuses on emerging technologies, such as virtual environments is limited. Second Life (SL) is currently the most mature and popular multi-user virtual world platform being used in education. Through an in-depth examination of SL literature, this article points out the most popular academic fields that SL has been applied such as education, medicine, computer science and media and presents a list of examples of SL applications by universities from all over the world. Then it explores its potential and the barriers that multi-user virtual environments present to educators, students and designers wanting to use immersive 3-D spaces in their teaching and learning. Although the literature on these issues is limited, the barriers are already known. Recommendations to address these issues are also provided in the discussion.

Web 2.0 and Second Life

Emerging Web 2.0 technologies, such as blogs, wikis, podcasts, mash-ups, social networks and virtual worlds, hold the potential to transform higher education. Brown & Adler support that these new Web 2.0 tools are built on encouraging interaction and collaboration, two concepts that are at the foundation of participatory learning, in which participants move from being passive consumers to active contributors (Bowers, Ragas & Neely, 2009). Recent interest in experimenting with new participatory educational tools for the college classroom has thrust virtual world SL into the spotlight. SL, the leading user created on-line virtual world, is gaining a great deal of ground in the

interactive learning environment discussion. Therefore, it becomes important to examine how educational institutions perceive the effectiveness and potential of SL's application to academia.

Second Life is an Internet based three-dimensional virtual world, created by San Francisco based company Linden Labs on June 23, 2003. A number of free client programs called Viewers enable SL users, called Residents, to interact with each other through avatars. Residents can explore the world (known as the grid), meet other residents, socialize, participate in individual and group activities, and create and trade virtual property and services with one another. Residents navigate by walking, flying, or teleporting. Being logged onto or being inside SL is referred to as being *in-world*. SL is intended for people aged 13 and over and as of 2011 has more than 20 million registered user accounts (Wikipedia, 2011).

Wagner (2008) states that despite the existence of other virtual worlds, none has matched the popularity of SL. SL has a strong user base and strong attraction for new users, with some attributing its popularity to the large amount of varying in-world activities.

Second life and Education

Over the past several years, educators have begun exploring virtual worlds like SL as a powerful medium for creating instruction. As it is stated on ANGEL Learning website, SL has been used as an educational strategy to promote peer to peer learning; mentorship and apprenticeship relationships; learning by doing with hands on activities; role play; and self-directed, inquiry-based learning to name a few (ANGEL Learning Isle Steering Committee, 2008). In addition to educators striving to create a pedagogically sound learning environment, both educators and learners desire the learning content to be engaging (Cooper, 2009, p. 3).

While SL was not developed specifically with education in mind, its open-ended possibilities have caught the attention of post-secondary educators across a wide array of disciplines. In a survey of higher education instructors from fifteen countries and twenty-five different academic disciplines, who had experience using SL as an educational tool, Bowers, Ragas, and Neely (2009) found that Education, Journalism/Media/Communications and Computer Sciences made up nearly half (48.7%) of the respondents' disciplines, while the other 51.3% of respondents were divided among 22 other disciplines. Some of them were architecture, health, law, languages, physics, engineering, history, geography, and psychology to name a few. They also found that in general terms, respondents were satisfied with the technology and perceived it to have a positive impact on student learning. Nearly 94% of the respondents indicated that they intended to use the program in future classes.

It is believed that over 300 universities, most of them in the UK and the USA, some in Continental Europe, Latin America and Asia, have bought virtual land so far (Salmon & Hawkridge, 2009). However, the number of universities that own land in SL is hard to establish. Websites like simteach.com that list islands do not include all that are active and some shown may have become moribund (Simteach, 2011). There are some cases of university presence in SL, when just a few academics and students are involved, only for the duration of a short-funded project. In other cases, permanent occupation exists, with thousands of visitors each month.

Examples of Second Life uses in Higher Education

There is a significant number of applications of SL, as they perceived by different Universities in Higher Education. Kirriemuir (2008) summarized a list of examples of SL applications by UK universities. More specifically, Kirriemuir (2008) discussed the returns from 46 institutions. He gave the example of the University of Surrey that was evaluating SL's potential for encouraging and supporting problem-based or enquiry rich learning experiences and for encouraging immersion to help students to master unfamiliar situations. The University of Edinburgh was using SL as a tutorial space for learning about and discussing online identity and other topics within the MSc in e-learning and as a social space for distance learning students and tutors to meet. Several British universities told Kirriemuir (2008) that they were using SL as a research environment. For instance, the University of Sheffield was studying SL as a learning space and at other universities, creative arts activities were being extended into SL. The University of Huddersfield used SL as an environment for virtual psychological

experimentation. Some universities had postgraduate students studying SL as an environment for education. The Open University set up Cetlment island in SL for research into teaching and learning in multi-user virtual environments (MUVEs). The island, now closed, was like a campus, with collaborative shared areas at the centre, including a library and resource.

In the medical field, Toro-Troconis (2008) reported a trial by Imperial College London of game-based learning activities in SL for virtual patients, while Burden, Woodham and Savin-Baden (2008) mentioned a problem-based learning for healthcare distance learners. Daskalova (2008) also included the Imperial College's project "Second health" in her summary of the best health (educational) practices in SL. She also quoted the nursing educational simulator by Tacoma Community College in USA. In addition, a virtual neurological education centre (VNEC) developed by the University of Plymouth in UK offers a virtual simulated experience, where people can actively expose themselves to the most common symptoms that a person suffering from a neurological disability may encounter.

Papp (2010) predicts a shift to online classes until 2014 and discusses examples of higher education institutions that already offer online education and have presence in SL. He quotes, for example university of St. Leo in Dade City, Florida which developed a comprehensive presence in SL in 2008 and now has three islands and offers classes supporting its 10,000 online students and 1,700 on-campus students. The university's presence is even responsible for enrolling students on-line who had never heard of St. Leo before visiting SL. Another example of a university using SL is Texas A&M. They have 10 virtual classrooms and have duplicated many buildings and landmarks on their campus (Papp, 2010). Despite their landlocked real campus, students visiting the virtual campus can spend some time relaxing at the virtual beach adjacent to campus. In a virtual world, geography does not matter!

University of Houston's Money & Design is a design economics course of real live modeling of business practices in a virtual world where designers can try their design and entrepreneurial skills against an entire market rather than the code of simulation software. SL provides a real time simulation with real time economy and fickle customers. This all makes for a realistic and quick experience in running an entrepreneurial venture with the favorite coin of the land design (Simteach, 2011).

Elon University's students have led a variety of learning experiences in SL, including: 1) conducting "open houses" for the SL planetarium, a virtual facility created by Professor Crider for demonstrating the motions of the stars. (Approximately 30 students wrote astronomy shows for the planetarium in Fall of 2006), 2) sponsoring public outreach events in SL related to the University common reading, such as one called "An Inconvenient Truth". (Approximately 60 students built simulations inside SL related to the theme of global warming), 3) writing-intensive technology and society seminars on cyberculture and the social impacts of virtual worlds and 4) researching mathematical concepts and building models of these concepts, for example building a model of the Galton board used in many statistics demonstrations (Simteach, 2011).

Ohio University, a pioneer in SL with a campus dating back to 2007, currently consists of three sims, two in the Main Grid, one in the Teen Grid. The blueprint was based around how best to serve traditional college students, adult and distance learners, high school students, and middle school students in a convenient and engaging fashion that would allow for both synchronous and asynchronous learning experiences (Simteach, 2011).

The School of Hotel & Tourism Management of Hong Kong Polytechnic University built a virtual campus for new student orientation in 2007. This has been designed to help new students adjust to university life and make the transition from secondary school with a range of interpersonal, learning and self-management ideas. Therefore, they have set up a series of learning activities (practical information, games, visual media, resources), planned community activities (meeting teachers and student mentors) as well as optional social activities (getting to know new classmates etc). Hong Kong Polytechnic University also opened its PolyU virtual campus on SL in September 2009. PolyU is known for its innovation in teaching, research and applied learning. This digital platform readily provides both academics and students with exciting opportunities to enrich their teaching and learning experience (Simteach, 2011).

Athabasca University (AU) purchased its own island in 2007. Athabasca does not offer classes that are completely conducted in SL. However, students can visit Athabasca research center, select their course by clicking in the packages, visit interactive web pages, link to the online registration form, ask questions to the AU info lab, discuss with chat or conversational agents and participate in various informal activities. Some of the graduate level

courses hold meetings there and the School of Business celebrated convocation there as well. The University has also created the AU library in SL. AU library has developed a project called 'Virtual gallery' with a number of collections, images and photographs. The idea of this project is to give users the experience as if they were visiting a gallery in real life (Auspace, 2008).

Strengths and Weaknesses of Second Life

The adoption of multi-user virtual environments (MUVEs) for educational purposes and particularly of SL seems overall to have a positive impact on teaching and learning. However its adoption is not without problems. There has been a lot of discussion about the advantages and disadvantages of SL. The following section reviews the literature on the strengths and the weaknesses of SL.

Inman, Wright & Heartman (2010) analyze findings and recommendations of 27 research studies. They identified potential problems when using SL in education, including issues with the SL software and hardware requirements, a steep learning curve and the possibility of students becoming exposed to distractions or inappropriate content. Researchers also discussed potential uses of SL including role-play, game and simulation creation, implementation within distance education programs and the ability to encourage student-centered learning activities.

Warburton and Perez-Garcia (as cited in Warburton, 2009, p. 421) through a review of work carried out on MUVEs and in particular SL identified the components of the Second Life experience which can facilitate innovations in pedagogy. These include:

- Extended or rich interactions: opportunities for social interaction between individuals and communities, human–object interaction and also intelligent interaction between artefacts
- Visualization and contextualization: the production and reproduction of inaccessible content that may be historically lost, too distant, too costly, imaginary, futuristic or impossible to see by the human eye
- Exposure to authentic content and culture
- Individual and collective identity play
- Immersion in a 3-D environment where the augmented sense of presence, through virtual embodiment in the form of an avatar and extensive modes of communication, can impact on the affective, empathic and motivational aspects of the experience
- Simulation: reproduction of contexts that can be too costly to reproduce in real life with the advantages that some physical constraints can be overcome
- Community presence: promoting a sense of belonging and purpose that coheres around groups, subcultures and geography
- Content production: opportunities for creation and ownership of the learning environment and objects within it that are both individual and owned.

Warburton (2009) also discusses the barriers to successful implementation of SL as an educational tool and classifies them under eight broad categories. The first category concerns technical problems and includes two subcategories. The first one is "machine-related client-side issues" such as bandwidth or hardware and the second one is "human or use-related issues" such as navigation or avatar's manipulation. Next come the category of identity problems. The fluidity and playfulness inherent in SL identity construction can be disconcerting and confusing. The third category concerns cultural problems. SL can be an isolating experience and can feel destabilizing, and outside the 'safety zone' a place of no limits, no boundaries and no restrictions on behavior. The forth category includes collaboration problems. Cooperation and co-construction need to be scaffolded, and building trust and authenticity are critical factors for successful group activities. The next two categories include organizational issues such as lack of time for preparing well-designed activities in SL and economic factors that may obstacle the implementation of an SL project. A basic account is free but anything beyond simply being present in-world costs money: buying land to create teaching spaces; uploading images and textures; and purchasing useful in-world tools, employing building and scripting expertise. The seventh category has to do with the lack of open standards which remain a major problem for developers. The final category concerns scaffolding persistence and social discovery problems**.** These are closely related with collaboration problems. The in-world profiles associated with each avatar provide a limited

mechanism for the social discovery of others. Although a number of web-based services have now appeared to bridge the connection between in and out of world and augment the possibilities for social discovery and scaffold avatar persistence, yet problems in which avatars remain trapped at the centre of its own community exist.

Similar findings were reported by Wheeler (2009) when listed technical issues and academic-related hurdles that came up under the development of the virtual Media Zoo in SL. These concern development time, client versioning, preparation of suitable activities and communication mechanisms. He also notes that scripting (programming) skills must be acquired to create islands, landscapes buildings and objects.

Other studies of educational work involving SL have identified where components of the SL experience can facilitate the paradigm shift in education. Kay and Fitzgerald (2008) have developed a set of categories that represent the current educational activities of SL. They include: self-paced tutorials; displays and exhibits; immersive exhibits; role plays and simulations; data visualizations and simulations; historical recreations and re-enactments; living and immersive archaeology; machinima construction; treasure hunts and quests; language and cultural immersion and creative writing.

Bronack, Riedl, and Tashner (2006) found that the use of SL as an educational tool has helped teachers interact with students "in more fluid and natural ways." It also allows students to interact with their virtual environment. Likewise, Cheal (2007) suggests that the use of virtual world programs in education is not only inevitable as part of the evolution of teaching and learning, but also a positive development, as it fosters active, experiential learning. However, using SL as a virtual venue for traditional lectures is likely to be unpopular and ineffective with students, as the format of SL promises interactivity and not the passive nature of lectures. Similar are the results of a pilot study which has been designed to compare the experience of a SL lecture to a real world lecture. Cliburn & Gross (2009) found that those who attended the real world lecture performed significantly better on a posttest quiz than those who attended the same lecture in SL. Making use of the unique opportunities for creation and interaction, on the other hand, is both popular and facilitates higher-level learning.

In a recent case study of the integration of SL into an introductory computer course Wang & Braman (2009) found that SL 1) improves students' learning experience through the design of appropriate class activities, 2) provides students the sense of reality through simulation, 3) provides nonverbal cues in online discussion, 4) provides the capability of interaction between students and various people from around the world to discuss class topics, 5) provides an advantage for some assignments (3D modeling, online social interaction, role playing, etc.) through visual and immersive aspects and 6) provides the instructor the key capability of teaching in an online environment without time/space constrains. Authors also summarized the most important barriers which appeared under the development of the course in SL. These concern 1) the complexity and steep learning curve of the environment, 2) the difficulty in the orientation in the surroundings when guidance is not designated and provided appropriately as part of the instruction, 3) the limitations with computer hardware, bandwidth and lab resources and 4) the potential for "griefing". "Griefing" is a term used for bad behavior, disruption and virtual violence. One of the most notable examples of griefing occurred in May 2007, shortly after the tragic shootings on the real world Virginia Tech campus, when a virtual gunman began shooting other visitors on Ohio University's Second Life campus. While no avatar was hurt or killed, the university temporarily closed its island in Second Life (Au, 2008).

Recommendations

Due to the lack of literature offering practical guidelines for learning design using SL, it is necessary to refer back to established literature relating to e-learning. Existing approaches to online learning design are relevant in designing for SL. Salt, Atkins & Blackall (2008) suggest that four steps need to be considered when designing learning in SL. These are: context, activities, resources and support. The place to begin is to understand the context i.e. the students and the learning outcomes. After agreeing on the details of learning, activities come next and Second Life offers new opportunities and challenges here. It may be beneficial to supplement in-world activities with others in real life or other online environments to achieve the desired learning outcomes. The third step is finding, customizing or building resources. Testing these with users is important and rethinking the activities and builds where necessary in response to user feedback. In parallel, it is important to think about effective support that relies on both 'physical' and human elements. Well-designed resources that clearly communicate to students the purpose of activities and the expectations of students and tutor, are easy to use and fit for purpose, are important for

effective virtual learning and can decrease demands on the human support. At each stage, the virtual world environment means that extra questions need to be considered and answered.

Wang & Braman (2009) summarize findings concerning the effective design of assignments or activities for learning in an environment like SL and provide a list with five recommendations 1) provide training to students before carrying out any serious tasks to make sure students know how to navigate in the system and how to control their avatars, 2) use a combination of class discussions, videos, hands-on lab sessions in SL and research-based projects to improve student engagement and learning, 3) give students the freedom to form groups and to select project topics in an area related to the course to increase student motivation, 4) design activities for small groups to make sure that both the instructor and students will not be overwhelmed by the amount of work involved and 5) determine the role of SL in the course before designing or implementing any activities.

Freitas et al. (2010) suggest educators and designers the use of a four-dimensional framework for designing and evaluating immersive learning experiences in a virtual world. The framework proposes four dimensions: the learner, the pedagogic models used, the representation used and the context within which learning takes place. Each dimension has dependencies upon the others; however, jointly, the four dimensions provide a conceptual framework for exploring immersive learning and, have implications upon learning design as a whole, particularly when applied to immersive learning environments.

Finally Inman, Wright & Hartman, (2010) summarize findings from fifteen research studies concerning the effective design of assignments or activities for learning in an environment like SL and provide a list with four recommendations. 1) establish a clear connection between course objectives and activities in SL, 2) incorporate technical training and support into any planned SL activity, 3) create scaffolded learning activities for students so they can practice inside SL and acclimate to the virtual environment and 4) design and construct different spaces to encourage different types of student interaction.

Conclusion

To sum up, the technical, immersive and social affordances of MUVEs like SL offer many new potentialities for educators, however these must be weighed against the barriers to managing a new technological environment. Despite the high level of activity in the area, clear guidelines for practice remain difficult to find. This paper reviews the literature for SL applications, in order to summarize the affordances and the limitations of SL and finally suggests recommendations for future use by universities. Our intention was to create an SL guide so as to facilitate prospective adopters pass the path from first to second life. Each one of the identified barriers to the use of SL represents a challenge that requires the careful consideration of a number of design possibilities. Only by constructively approaching each one barrier separately, it is possible to make design decisions that encourage the positive and rewarding use of virtual worlds for learning and teaching. Moreover, as the use of 3D immersive virtual worlds in higher education expands, it is important to examine which pedagogical approaches are most likely to lead to a successful outcome. Until now, no identified pedagogy has been established for teaching in 3D environments. In such promising, alluring but also difficult and problematic spaces, such as SL, teaching practices still remain a "pedagogy for uncertain times", as referred by Barnett (2007). Barnett states that a pedagogy for uncertain times has itself to be uncertain. However, the lack of standardized skills and competences required for teaching in a SL environment is an issue of major importance that needs to be addressed, so as educators feel 'safe' in this environment and confident to support their instruction. Second Life has a number of limitations as an eLearning platform in its lack of provision of tools to support asynchronous discussion and reflection on experience. Attempts like Sloodle which is the result of SL and Moodle collaboration, significantly helped instructors to enhance and support effective communication and learning in SL (Sloodle, 2011). Sloodle provides integrated support and management features to educators and learners but further research for external applications to support learning experience is required to bridge the gap between 3D and web-based virtual learning environments.

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