

Second Life<sup>®</sup>: Building 3D Virtual Classrooms for the Future

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ABSTRACT

The educational system today is in need of a massive overhaul. With student apathy, truancy and dropouts on the rise, there is need for a new way to educate students. The online virtual world Second Life<sup>®</sup> has the capabilities to serve as an excellent educational tool. Students are currently building, buying, creating, conversing and learning in this online environment. It provides students and teachers the flexibility of learning from home and at their own pace. Students enjoy working with this type of technology and many find it easier to interact with professors via the medium. Second Life<sup>®</sup> is not without flaws, however. It can be hard for students to navigate and get accustomed to, and there are numerous technical glitches that can get in the way of learning. Despite these problems, the capacity for learning that Second Life holds greatly outweighs any of its potential problems. Add in the possibility of cross-platform collaboration and Second Life<sup>®</sup> may just be the educational tool of the future.

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## Chapter I: Introduction

Information and Communication Technology is the field of study that involves all technical means of processing and communicating information. ICT is based on the convergence of Information Technology and Telecommunication Systems. Within ICT, there are many different ways to disseminate information. Multiple types of technology pave the way for communication in the 21<sup>st</sup> century. Because of the rapid pace of technology, there are bound to be gaps in many sectors of business and education. For the purpose of this research, the review of literature will focus on the use of the online virtual world Second Life<sup>®</sup> in education.

All across the world, education faces major challenges. In the United States and throughout Europe, schools are faced with three major problems in the system: truancy, dropouts and apathy. According to the Alliance for Excellent Education, over a million students in America who enter their freshman year of high school, do not graduate with their peers four years later. There are countless reasons why students drop out of school, including difficult transitions to high school, deficient basic skills and a lack of engagement. The costs of dropping out of high school are enormous. Dropouts from just the Class of 2008 will cost the US more than \$319 billion in lost wages during their lifetimes. According to the Alliance for Excellent Education, “If the United States’ likely dropouts from the Class of 2006 had graduated, the nation could have saved more than \$17 billion in Medicaid and expenditures for uninsured health care over the course of those young people’s lifetimes” (costs section, para. 4). (Fact Sheets and Statistical Analysis, 2009)

If educators in the United States increased the graduation rate and college matriculation of male students by just 5 percent, the country could save almost \$8 billion each year by reducing crime-related costs. (Fact Sheets and Statistical Analysis, 2009)

According to Coughlan (2009), truancy rates in schools in England have reached an all-time high. The statistics from the last two terms during 2008 show that 1.03 percent of school days were missed by students. That number is up from 0.97 percent. While illness and family vacations are the top two reasons why students miss school, persistent truants (students who miss more than a fifth of school sessions) made up 46 percent of unauthorized absences.

Widespread student apathy, particularly with minority students, is yet another hurdle educators are faced with today. Many teachers and administrators think that when students are not doing well in school, it is because they are lazy, they don't value education and their parents do not care. The quality of student's relationships with their teachers can influence their behavior and their opinions of school. Many factors contribute to a student's lack of commitment, or a teacher's perceived sense of apathy. Expectations, instructional practices, curriculum, testing, discipline, and racial tension are just a few. Changing mindsets, working with parents and other educators, and insisting on a high quality education for all students are things the educational system needs to work hard on. (Thompson, 2008)

There is a great opportunity right now to bring students back to caring, to help them learn and make them want to learn using technology. Many schools today are stuck in the 1950's. No cell phones allowed in classrooms, limited computer access, restricted web-page browsing; all these restrictions are hurting students and the educational system. The fear of the

unfamiliar, equal access and loss of control are the three main reasons why technology has been restricted. (Farr, 2009)

The purpose of this research paper is to review the literature and articles written about the 3D Virtual World, Second Life<sup>®</sup>. By looking at studies on the effects of Second Life<sup>®</sup> in education, one can see how this technology can help with dropouts, truancy and apathy. This online virtual world could be used in classrooms to make a unique and new learning environment that makes students care and want to learn. After looking at how some schools are using Second Life<sup>®</sup> today, the author will make recommendations on the use of this technology in the educational system.

## Chapter II: Current Status of Technology

Wikipedia.org describes Second Life<sup>®</sup>:

*Second Life<sup>®</sup> (SL)* is a virtual world developed by Linden Lab that launched on June 23, 2003, and is accessible via the Internet. A free client program called the Second Life<sup>®</sup> Viewer enables its users, called Residents, to interact with each other through avatars. Residents can explore, meet other residents, socialize, participate in individual and group activities, and create and trade virtual property and services with one another, or travel throughout the world, which residents refer to as the grid. Second Life<sup>®</sup> is for people aged 18 and over, while Teen Second Life<sup>®</sup> is for people aged 13 to 17.

Second Life<sup>®</sup> is a virtual world that features shared spaces (multiple users can be in the same space at one time), a 3D representation of self by use of an Avatar, and immediacy of action (just like the real world). A virtual world gives users the illusion of being there, the movement and the physical landscape helps to keep users connected. As Warburton (2009)

states, “A virtual world provides an experience set within a technological environment that gives the user a strong sense of being there” (p. 415).

Second Life<sup>®</sup>'s technical infrastructure is built on a client-server model. The graphical user interface is local and 3D virtualization is provided by Havok physics running on servers owned by Linden Labs, Second Life<sup>®</sup>'s creator. Virtual experiences happen in real time, and there is openness in user-content creation. The audio in SL changes as avatars move throughout the world, creating a richer user experience. The tools used for creating objects and environments are sophisticated and do not differ that much from computer-based application development. All types of shapes from cubes to cones form the basic building blocks of Second Life<sup>®</sup>. (Warburton, 2009)

Warburton (2009) discusses that SL allows for social interaction; it is an open-ended system that offers the player many options for use. In SL, users can choose to build and own objects, join networks and use money, in the form of Linden dollars, to perform transactions. While SL provides users with a range of different settings that lead to different education experiences, “SL also supports role-playing game communities and some degree of cooperative work flow through the in-world tools and devices that have been built by residents” (p. 416). (Warburton, 2009)

According to a BBC News article, Second Life<sup>®</sup> had 1.4 million users between March and April of 2009 out of its 17 million registered users. This growing site may just be the new educational frontier. Residents of Second Life<sup>®</sup> can spend their time visiting exact replicas of tourist hotspots, shops, and fantasy lands. The competition between virtual worlds is fierce. Some have created a niche for themselves in attracting a certain type of user, but so far, Second Life<sup>®</sup> has remained at the top by appealing to a mass population. The BBC news article states,

“By having a broad-based platform that appeals to a large audience, and supplying the tools and experiences they are looking for, you can reach a very wide audience” (p. 1). Second Life<sup>®</sup> has great business potential; the sale of digital goods is a booming market. People will continue to buy digital creations of real world items. Avatars in Second Life<sup>®</sup> can wear Prada, Gucci and Dior, just like their real world users do. Virtual worlds are becoming more integrated with the web and new applications continue to pop up each day. (Virtual worlds and web 'merging', 2009)

Second Life<sup>®</sup> is what its name suggests, a virtual world that allows users to have a “second life” outside of the one they have now. Second Life<sup>®</sup> is based on user created content so most everything seen in the world was built by users. While much of life can be replicated in Second Life<sup>®</sup>, there are benefits like flying, teleporting and visiting exotic places that is not available in real life. It is this combination of fantasy meets reality that keeps users coming back.

### Chapter III: Future Enhancements

Linden Lab has been busy working on creating and building new tools for its Second Life<sup>®</sup> residents. But, it has not been working all on its own. Linden Labs started awarding residents in 2009 for innovative new ideas and projects that help people learn and communicate with each other. They are organizing the Linden Prize again for 2010 in hopes of getting an “innovative inworld project that improves the way people work, learn and communicate in their daily lives outside of the virtual world” (para. 2). (The Linden Prize FAQ) Among last year’s recipients were the Alliance Virtual Library, awarded for their efforts to collaborate with an “international community of volunteer librarians, educators, non-profits” to work together to “discover and develop exciting and innovative educational services in the virtual world of Second Life<sup>®</sup>.” (The Linden Prize Finalists) The American Cancer Society was awarded for



their efforts in continuing the fight against cancer in Second Life<sup>®</sup> and the Invisible Threads program was recognized as well. The Invisible Threads program is described as:

Invisible Threads is a mixed reality performance installation that explores the growing intersection between labor, emerging virtual economies, and real life commodities through the creation of a designer jeans sweatshop in Second Life<sup>®</sup>. Simulating a real life manufacturing facility that includes hiring Second Life<sup>®</sup> "workers" to produce real world jeans sold for profit, the project provides an insider's view into current modes of global, telematic production (para. 3). (The Linden Prize Finalists)

In addition to calling Second Life<sup>®</sup> residents to action, Linden Lab has been working with IBM to connect different online destinations. (Virtual worlds and web 'merging', 2009) RedOrbit.com recently posted some information about Linden Labs and the new Second Life<sup>®</sup> Work Marketplace, a project to be unveiled in early 2010. The program will let customers create their own virtual world while adding revenue streams for the company. According to redOrbit.com, "Linden said 14 companies are already taking part in the Beta version of the Second Life<sup>®</sup> Enterprise. Those companies include IBM, Northrop Grumman, Naval Undersea Warfare Center, DefenseWeb Technologies, Case Western Reserve University, The New Media Consortium and others" (para. 5). (Second Life Targets Enterprise For New Service, 2009)

Warburton (2009) had some advice for Linden Labs in order to increase the learning potential in an educational setting. The need for open standards and the experimentation with open-source is at the top of the list. Creating portable identities is another future enhancement and Warburton (2009) states, "free avatars to roam from virtual world to virtual world maintaining their identity and assets across multiple platforms." Handing off ownership to peer-to-peer architects could help bring a stronger connection to a personal virtual space. Finally, by

getting the input of Second Life<sup>®</sup> residents, the owners could provide a richer immersive experience. (Warburton, 2009)

Second Life<sup>®</sup> is going to have to adapt and change to meet its user's needs. It is clear that there are software glitches and security issues that need to be addressed. In addition, it is recommended that Linden Lab continue to work with other companies in order to create a better online world for residents.

#### Chapter IV: Literature Review

Twining (2009) detailed how researchers developed the "Schole Park Programme" to test the potential use of Second Life<sup>®</sup> in educational settings. There is a rapid change happening with technology and a perceived "skill gap" within newer generations. Twining points out that, "growing rates of disaffection in schools (Webb & Vulliamy, 2004), growing teenage truancy (cited BBC news article), and the increasing migration of parents away from school and towards homeschooling (Curtis, 2004)" (p. 497) are a large part of the problem. Educators need to look into new ways of educating students today. The Schole Initiative was proposed in order to break free of current educational constraints and create radically different lived experiences. Twining claims, "The reform of our existing systems will fail to deliver an optimal system, the degree of change needed is too great" (p. 496).

Virtual worlds can provide a totally new educational model. They allow students to do things that are impossible in the real world. Spaces encourage playfulness and testing of boundaries. Twining (2009) created a virtual world called Schole Park which was the name of their island in Teen Second Life<sup>®</sup>. They created a learning space to mirror an actual campus. After initial dissatisfaction with that design, they moved to a more natural space and left space

for students to develop. In the physical world, buildings serve functions but in Second Life<sup>®</sup>, a classroom could be in the sky or in a river. This allows for more creativity when designing a learning space in Second Life<sup>®</sup> and engages students. (Twining, 2009)

Twining (2009) detailed “four dimensions of learning,” they are as follows: “learning about, learning by doing, learn by playing a role, learn by becoming.” Using a virtual world allows students the freedom to explore and gives them opportunities they may not have in real life. Twining cited that virtual worlds allow people “to play out their personal preferences without being constrained by established roles and behavioral expectations” (as cited in de Nood & Attema, 2006, p. 20).

Bailey and Moar (2001) describe their project as such, “The Vertex Project is a school-based action research project which sets out to investigate the creative applications of three-dimensional shared virtual world technologies in primary education” (p. 20). The software used in this research study was called Activeworlds, and it was chosen for its ease of use and the ability to edit and construct easily within the environment. The study was done on 7 to 11 year-old students and this particular software was good for teachers and students because the schools could work in a secure environment that was not accessible to the public. In addition, Activeworlds has an internet browser incorporated into it so students could access the web from within the 3D world. (Bailey & Moar, 2001) Bailey and Moar (2001) discuss their ideas behind the program:

Central to our approach therefore, is creating opportunities for children to use technologies creatively, expressively and collaboratively- an emphasis being on the importance of children experiencing learning through making, together with the

development of peer-to-peer communication and collaboration via the networks of the Internet (p. 22).

Bailey and Moar (2001) made some initial observations when they first introduced the technology to the students. They noted that children were immediately drawn to the technology; they were excited and enthusiastic, highly motivated and appeared engaged throughout the whole process. Many of the children reacted to the technology as a “game.” Once most realized what things they could not do within Activeworlds, they moved on to finding out what they could do. They enjoyed talking with other students in the environment. The researchers noticed a difference in the way the students viewed their avatars, some saw them as characters, others felt like they were inside the world. (Bailey & Moar, 2001)

Building was another aspect of the 3D environment that Bailey and Moar (2001) looked at. Through watching the children, it became apparent that the children were determined to build something of their own despite the complex process. Many of the children worked together to build by collaborating, discussing, planning and negotiating. The researches documented that both teachers and students responded positively to the technology. They recommend further study on the “communicative, collaborative and creative possibilities” embodied in the technology. They also made note that the technology has possibilities in the field of Art and ICT. (Bailey & Moar, 2001)

Baker, Wentz and Woods (2009) looked at how Second Life<sup>®</sup> can be used in classrooms today. The authors discussed the pros and cons of using SL and provided some suggestions for educators interested in using SL in their curriculum. There are over 100 universities in the world that rent or own space in Second Life<sup>®</sup>. Baker et al. (2009) noted that faculty use SL to “hold

lectures or meetings with students, display digital artwork, hold music performances, host gatherings, and build virtual environments” (p. 60). Baker et al. (2009) states,

For example, Princeton University’s SL campus hosts music performances in their virtual Alexander Hall. The SL campus of the University of North Carolina hosts a virtual health clinic. The University of Kentucky’s SL site includes a library help center and an admissions and visitors center. Vassar College’s site has a live video feed from the college’s real-life quad. Faculty members can hold office hours in their virtual offices at the SL campus of Bowling Green State University (p. 60).

Not only do many universities have a presence in SL, but there are many educational groups that have active operations within the 3D world. Second Life<sup>®</sup> can be used as a meeting site for instructors and students, professors can have office hours, meeting times can be set within Second Life<sup>®</sup> and lectures could be held online in SL as well. In addition, Second Life<sup>®</sup> is convenient for students; they would not have to travel to campus. (Baker, Wentz, & Woods, 2009)

The advantages to using SL in education are many. SL exposes students to a new technology and can increase student engagement. Students who may not speak up in class may be more willing to participate online in Second Life<sup>®</sup> because they can input information via text chat. Second Life<sup>®</sup> can also be seen as a platform for informal interaction between students and staff. There are also many disadvantages to using SL. There is a considerable learning time involved and it takes a while to create avatars and learn how to navigate within SL.

Technological requirements and glitches may slow many students down. There can be a lack of student willingness to try a new technology, instructors may have to learn new class management

techniques, and there are many security and privacy issues involved with using Second Life<sup>®</sup>. (Baker, Wentz, & Woods, 2009)

Baker et al. (2009) suggests that all students have an educational objective, teachers must be prepared for the unexpected and have a plan. Teachers need to prepare students for the social experience; starting small can help as well as having students learn about the application with a partner. Students and teachers must learn together, and it is important for professors to spend time in SL so they are better able to understand students when they have problems.

Second Life<sup>®</sup> seems to be the virtual world chosen by educational systems because it is the most mature of the virtual worlds, it has a high usage, it has relatively low-cost and it allows users the ability to create complex objects and environments. It also uses sophisticated graphics and is an immersive experience for users. (Warburton, 2009)

SL does provide users with a profoundly immersive experience; when inside SL it feels like you are there, and there is a co-presence when other avatars are around. Real world norms of interpersonal distance and gaze seem to have translated over to Second Life<sup>®</sup>. In addition, there are similarities between teacher/student interactions in SL and those in real life. Warburton summarizes, “These findings suggest that the immersive nature of the virtual world, crossing physical, social and cultural dimensions, can provide a compelling educational experience, particularly in relation to simulation and role-playing activities” (p. 419). Socialization is another interesting aspect of Second Life<sup>®</sup>, because there are multiple communication channels in SL this makes social acts more like real life. There are also viewable user profiles that can help users get information about others in SL. (Warburton, 2009)

The function of Second Life<sup>®</sup> in education could help facilitate new learning experiences. Educators can rely on SL’s rich interactions, visualization and contextualization, authentic

content and culture, identity play, and rich user immersion to help bring information to and teach students. Second Life<sup>®</sup> is already being used in a wide variety of educational settings for a multitude of purposes. Self-paced tutorials, displays and exhibits, role play and simulations, treasure hunts, creative writing, data visualizations, historical re-enactments and language and cultural immersion, are just a few of the ways Second Life<sup>®</sup> is already being used to foster learning. Different approaches to learning do exist including role play and performative learning, experiential learning, cooperative learning and game-based learning. (Warburton, 2009)

Although there are already, and continue to be, excellent ways to use Second Life<sup>®</sup> in education, the application is not perfect. The graphic capabilities of SL depend a lot on what software and computer system a user is working with. The stress of the frame rate in SL when there are many objects and users in a particular area can cause a “drag” on the system. Basically, the dynamic content becomes jerky and unstable and can be very frustrating for users. In addition to those problems, keeping up with system updates and installing new applications can be a burden. User identity is another barrier in SL; users who are unfamiliar with virtual worlds may have a hard time acclimating to the fluidity and playfulness of SL, and this can be confusing and make building social networks problematic. SL does have its own culture which can be seen as isolating. Communities can be hard to find and SL operates with codes, norms and etiquette that are not straightforward and could be hard for some users to get accustomed to.

Collaboration and time are other things that can impede learning. Cooperation in Second Life<sup>®</sup> is hard to do unless you know the people you are working with; even simple things can take a long time in SL. Economics can provide another obstruction to learning. A basic account is free in SL but anything else does cost money. Buying land for teaching space, uploading images and textures and purchasing tools can rack up a steep price for educators wishing to use them. There

is a lack of open standards within Second Life<sup>®</sup>, and the system makes it difficult to combine other software. A final difficulty in using SL is the limited in-world social discovery. It seems as though some Avatars get trapped in their own social community. (Warburton, 2009)

Students can gain a host of new experiences when operating in virtual worlds. They learn basic reading skills in math, science and social studies and can engage in complex language. The technology requires action in the environment; as students play games they learn words and meanings associated with actions and images. Role playing games allow users to represent someone other than themselves, and digital media makes teachers the designer of and resource for their student's learning. (Gee & Levine, 2009)

Gee and Levine (2009) discuss ways in which educators can revise current teaching standards in order to fit the new generation of computer savvy students. Reconfiguring foundational literacy skills by linking to critical thinking, collaborative problem solving and media literacy is one way this could be made possible. Users can see how language is used and use it in other systems like math and science to solve problems. At UW-Madison a professor is using a virtual world to have students plan out their very own City of Madison. They focus heavily on urban planning, economics and social policy. Students are learning how different variables in the city relate to one another in complex ways and they are figuring out how language works as a tool for understanding the different complexities. Students use a lot of technical language and information in their final reports, and they come to understand the extensive nature of an urban ecosystem. At the University of Indiana, students use an application called "Quest Atlantis" to gather information, report on problems, develop theories and propose solutions. Students are able to see how problems arise and how a solution to one problem can lead to different problems in another area. "Students learn both the science behind



the game world and the linguistic and symbolic ways of communicating about this science” (p. 51). In addition, educators have noticed that this learning has transferred to better scores on standardized tests. (Gee & Levine, 2009)

Gee and Levine suggest that teachers become tech savvy; having a basic understanding and comfort with technical learning is key when implementing into curriculum. It is important for educators to spend time with YouTube, blogs and social networking. This may require some teachers to seek outside help and get information from a mentor. Hands-on work with digital tools is a must-do and research should be shared with other educators. (Gee & Levine, 2009)

The article by Fuchs and Shaum (2008) details how virtual worlds can help colleges and serve other purposes in the business world, “...virtual worlds increasingly represent an environment for colleges to teach, perform research remotely, recruit new students, raise money and connect with anyone, anywhere” (p. 4). Companies like IBM and Cisco are already using the technology of virtual worlds to meet with clients, business partners, and other branches. Fuchs and Shaum state that, “Some companies are interviewing and screening candidates through meetings and jobs fairs held in Second Life<sup>®</sup>” (p. 4). (Fuchs & Shaum, 2008) Fuchs and Shaum (2008) discuss the current applications of some schools today:

Anyone on Earth with an Internet connection can take a Harvard Law School course for free in Second Life<sup>®</sup>. Penn State College of Arts and Architecture plans a 3D virtual arts museum modeled after its Palmer Museum of Arts, since exploring an art gallery in 3D and discussing works with others has a superior, different feel to seeing 2D images of art on a webpage. The University of Houston is conducting obesity studies in SL. Professors are partnering in SL to conduct research studies. Educators are coordinating virtual field

trips. At one school, a class conducted the trail from John Steinbeck's 'Of Mice and Men' in SL (p. 4).

These are just a few of the many examples of ways to use Second Life<sup>®</sup> in education. SL is particularly helpful in distance learning; students who cannot meet in real life are able to talk and converse with each other in the Second Life<sup>®</sup> environment. While these are some of the great benefits of 3D environments, they are not without their pitfalls. Fresh, active content is needed in order to keep people coming back. Some areas in Second Life<sup>®</sup> run the risk of becoming too static and not appealing to users anymore. Avatars are limited in the way they communicate; there is a limited base of gestures and facial expressions. Face-to-face communication will always be better in the real world. "The 3D Web too will find its niches and its riches, as did its predecessor. As it does, those colleges that are committed to building strong relationships with key audiences in virtual worlds will see very tangible benefits in the real world" (p. 4). (Fuchs & Shaum, 2008)

In summary, Second Life<sup>®</sup> does have its drawbacks. The technical interface, different style and adaptations to life in SL, the time it takes to get used to the system, mature content and constant updates are just a few of the reasons to hesitate before implementing SL into the classroom. However, as noted by the elementary schoolers using Activeworlds and the students at UW-Madison creating their own city, all of these potential pitfalls can be outweighed by the opportunities a program like Second Life has. SL provides a way for teachers to step out of the box and look at new ways to engage students. Users are immersed in rich experiences and can plan and build their own world. Teachers and students can connect in Second Life<sup>®</sup> and this virtual world may be just the thing to bring back the apathetic, truent students.

## Chapter V: Impact Analysis

So far, the introduction looked at the need for the educational system to revise its current practices in education. The statistics show that there is a growing problem in trying to educate the youth of today, and many feel that there needs to be a paradigm shift in education. The review of literature looked into the pros and cons of using Second Life<sup>®</sup> in an educational setting. It also gave some insight into what some universities and schools are doing presently and perhaps those can serve as a model for the educational system as a whole.

The impact of Second Life<sup>®</sup> on education has huge potential. Not only can it create a link between teachers and students, it can bring all students together and provide them with the opportunity to learn and grow in a virtual environment. They can learn so much by trying new things and if professors use the technology correctly, they can learn a lot from field trips, creating new environments and online content.

The author's recommendations are as follows: start young, use SL with distance learners, continue to implement but grow and change with the technology, watch for new updates and proceed with caution, have a game plan and understand what students are doing. When a teacher immerses in the technology they are better able to understand and see the world as students see it. Obviously a professor must have educational objectives and a plan when using Second Life<sup>®</sup> in the classroom. Taking things slow is a great way to start. If teachers begin by using software like Activeworlds in elementary schools, students will be accustomed to an online world by the time they reach high school and can use a program like Second Life<sup>®</sup>. Continually changing, updating and knowing what new technology is being developed will help teachers keep things fresh and keep students engaged.

The educational system is in need of a change. By using an online virtual world such as Second Life<sup>®</sup>, students and teachers can come together to learn, create and grow in ways never done before.

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