

Virtual or Virtually U: Educational Institutions in Second Life

Nancy Jennings and Chris Collins

Abstract—Educational institutions are increasingly exploring the affordances of 3D virtual worlds for instruction and research, but few studies have been done to document current practices and uses of this emerging technology. This observational survey examines the virtual presences of 170 accredited educational institutions found in one such 3D virtual world called Second Life®, created by San-Francisco based Linden Lab®. The study focuses on what educational institutions look like in this virtual environment, the types of spaces educational institutions are creating or simulating, and what types of activities are being conducted.

Keywords—educational technology, emerging technology, metaverse, Second Life, virtual worlds

I. INTRODUCTION

THE World Wide Web revolutionized asynchronous information delivery. Built on internet technology, unlimited by distance or geography, the flat web changed the way in which the developed world could communicate. In the same way that the flat web revolutionized asynchronous information delivery, advances in internet technology are giving birth to new platforms that have the potential to revolutionize *synchronous and semi-synchronous* information delivery. These 3D virtual worlds borrow from gaming concepts, real world physics simulators, and existing streaming data/audio/video technologies to provide opportunities for real-time simulation, experiential learning, and collaboration in a virtual environment that, like the flat web, do not require participants to be in the same physical or geographical location.

Educational institutions across the globe have begun to utilize these technologies for instruction and have established research centers to further evaluate the potential of virtual environments. Some examples include the Game Research and Immersive Design Lab (GRID Lab) at Ohio University in the United States [1], and the Media Technology Resource Centre at the University of Bath in the United Kingdom [2]. Indeed, over 250 colleges, universities and museums have formed the New Media Consortium (NMC) to explore uses of digital media in teaching, learning, and creative expression [3]. Recent attention has focused on the growing use of a

particular virtual world known as Second Life [4]. Therefore, this study focuses on what educational institutions look like in this virtual environment, the types of spaces educational institutions are creating or simulating, and the types of activities being conducted in the virtual environment.

II. LITERATURE REVIEW

Faculty members are increasingly integrating technology in the classroom. Results of a longitudinal study of information technology in higher education indicate that more college courses are using technology resources [5]. Indeed since 1995, use of e-mail has increased from 20.1% of college courses to 59.3% in 2000. Similarly, 42.7% of college courses employed Web resources as part of the syllabus in 2000 compared to 10.9% of courses in 1995. In a collaborative effort, the New Media Consortium and the EUCAUSE Learning Initiative (ELI) have identified emerging technologies that are expected to follow these trends [6]. According to their report, virtual worlds such as Second Life, Active Worlds, and There are expected to become more widely used and more sophisticated within two to three years [6]. The report also suggests that just as with the development of the flat web, as more educational institutions begin to participate, the complexity and abundance of virtual locations for these institutions will continue to grow. Theories regarding the diffusion of innovation applied to educational enterprises provide insight to explore how this growth may occur. This study will explore how early adopters have utilized Second Life as a place of learning, research, and socialization.

Diffusion of Innovation in Education

Dispersion and use of information technology in the classroom can be described in terms of the diffusion model. Ev Rogers' [7] suggests individuals will adopt new technologies or innovations at differing rates based on a number of social and psychological characteristics. Rogers distinguishes five categories of adopters along a continuum including innovators (2.5% of the population), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%). Based on Moore's [8] examination of these categories, Geoghegan [9] characterizes these categories among educators as such:

Innovators ("techies"): These educators are truly interested in the technology itself, understand the hardware requirements and the software, and often form communities across

Manuscript received July 27, 2007.

N. A. Jennings is with the Department of Communication, University of Cincinnati, 620 Teachers College, Cincinnati, OH 45221-0184 USA (e-mail: Nancy.Jennings@uc.edu).

C. Collins is with UCit-Instructional & Research Computing, University of Cincinnati, 440.02 University Hall, Cincinnati, OH 45221 USA (phone: 513-556-3018; e-mail: chris.collins@uc.edu).

disciplines and institutions based on a common interest of the technology.

Early Adopters ("visionaries"): Educators as early adopters explore technologies to expand on cutting-edge instructional methods for teaching effectiveness. They are risk-takers, and apply an interdisciplinary approach to teaching, learning, and research. They are often skilled in use of technology, although not to the same extent as the innovators.

Early Majority ("pragmatists"): These educators are looking for tools to solve the day-to-day problems of teaching and research. Based on success stories from colleagues in their department or field, they would consider implementing a technology. They tend to be more risk-averse, and their community tends to be less expansive across discipline boundaries than the two previous groups.

Late Majority ("skeptical"): Educators in the late majority are more likely to adopt a technology that comes as a complete package and is well-established. They are not as technologically savvy as the previous groups and tend to stay close to home in their community groups.

Laggards: These educators are not likely to adopt technology as a pedagogical tool. They may even be confrontational to those who do use instructional technology.

Moore [8] articulates a "chasm" between early adopters and the early majority which may influence whether or not a technology becomes mainstreamed. While both see value in instructional technology, the striking differences between these two groups as seen in Table 1 has important implications on the use and acceptance of new innovations.

TABLE I CHARACTERISTICS OF EARLY ADOPTERS AND THE EARLY MAJORITY [9]

Early Adopter	Early Majority
Favor revolutionary change	Favor evolutionary change
Visionary	Pragmatic
Project oriented	Process oriented
Risk takers	Risk averse
Willing to experiment	Want proven applications
Generally self-sufficient	May need significant support
Horizontally connected	Vertically connected

With the projected adoption of virtual worlds within a 3-year timeframe, this provides an opportunity to examine the early adopters and early innovations to discover those aspects that may appeal to the early majority in anticipation of wide-spread use.

Second Life

Second Life was publicly released in 2003 by Linden Lab, a San Francisco based company founded in 1999 by CEO Philip Rosedale, former chief technology officer of RealNetworks. Rosedale was reportedly inspired by the depiction of a persistent, ubiquitous metaverse in the 1992 cyberpunk novel *Snow Crash*, and envisioned creating a virtual world where users could "digitize everything" [10] and collaborate in a 3D environment that would be built by the users themselves.

Similar to the technology used by the Massively Multiplayer Online (MMO) gaming industry, Linden Lab hosts servers that simulate a world environment with grass, trees, skies, and oceans. In contrast to MMOs and other simulation games, however, the Second Life software is distributed as a free download and the world is not pre-populated with content or a narrative storyline provided by the world's creators. Rather, the company provides a palette of content creation and communication tools to the user base, who individually and collectively create the places, objects, and activities in Second Life.

Since its public release in 2003, over eight million accounts have been created [11], and the users, or "residents" as they are known, have built replicas of real world locations, held in-world art openings [12], music concerts [13], and orchestral performances [14], and increasingly are using the medium to hold meetings, conferences [15], and teaching seminars using a combination of the built in text chat messaging features and external third party applications like streaming media and VOIP technology.

In addition to using the medium for displays and social events, residents also create virtual goods and services to buy, sell, and trade to others. Linden Lab facilitated this burgeoning economy through the Linden Dollar currency system, which can be exchanged for real US dollars, and by including the option to set objects "for sale" or "copy" as a standard component of the content building interface. The steadily increasing volume of virtual goods and services being sold in Second Life helped drive mainstream media coverage of the platform, and in 2006, a number of real world businesses like Dell [16], American Apparel [17], and IBM [18] opened their doors in the virtual world with much fanfare.

Less well known were the educational institutions that also began to explore the use of Second Life for instructional purposes during this period. Early adopters included the Alliance Library System in Peoria, Illinois [19], who established InfoIsland, the first library system in Second Life, and Ball State University in Indiana, where English instructor Sarah Robbins used Second Life [20] to teach students research and composition skills. In the fall of 2006, Harvard Law School offered a course in Second Life called "CyberOne: Law in the Court of Public Opinion" [21]. Harvard Law and Extension students received academic credit for the course, and members of the public could participate by accessing the course materials, videos, and a mock trial courtroom in the virtual world.

To date, no studies have been conducted which survey the landscape of educational institutions in Second Life. Therefore, this study examines how early adopters have begun to make themselves known in the virtual world of Second Life. Key questions that lead this research are as follows:

RQ1: Who are the educational institutions already using Second Life?

RQ2: What characteristics can be observed about the space educational institutions occupy in Second Life?

RQ3: How are educational institutions utilizing virtual

space in Second Life?

III. METHOD

A. Sample

Presence of 170 educational institutions, including accredited colleges, universities, and schools was identified in Second Life between April 15, 2007 and May 16, 2007. To determine whether or not an institution had a qualified presence in Second Life, institutions must have occupied a virtual location in Second Life or maintained a "group" in Second Life.

Two sources were used to identify virtual locations and groups in Second Life: 1) those located on Linden Lab's official website, and 2) those found in Second Life using the "search" tool within the program. Linden Lab hosts an education page on their official website located at: <http://secondlife.com/businesseducation/education.php>. From this page, Linden Lab links to a quasi-official list of educational institutions who claim a presence in Second Life, hosted on the SimTeach.com wiki: http://simteach.com/wiki/index.php?title=Institutions_and_Organizations_in_SL. This list was the initial source for the observational survey and yielded 115 institutions. An additional 55 possible candidates were detected using the built-in Search tool in Second Life, of which, 20 were determined to have a physical location that could be surveyed.

B. Unit of Analysis

The unit of measurement was the institution itself rather than individual departments or sub-units of an institution. Therefore multiple projects from the same institution were evaluated as a combined entity.

C. Codes

Several variables were recorded for each institution. For all institutions, the name, location, and website address of the real life institution were recorded. The country of the real life institution was also coded into a geographic region based on the United Nations regional codes located at <http://unstats.un.org/unsd/methods/m49/m49regin.htm>. All institutions that occupied virtual land in Second Life were assessed for various land characteristics and uses. For land characteristics, all items were assessed for presence within the virtual space. If an item was not found, no presence was recorded. Items searched for included the institution's official logo, a welcome sign, a map or diagram of the virtual location, sidewalks, pathways or footpaths, any greetings, links to websites, and teleports. For land uses, various activities and spaces were noted. Activities included evidence of the space being used for academic courses, either offered solely in Second Life or as a hybrid (traditional face-to-face instruction combined with instruction or activities in Second Life), other types of events such as social gatherings, and whether the event was in progress at the time of the virtual visit. Spaces included areas reserved for specific uses. Educational spaces included classrooms (seating for up to 25 avatars), auditoriums (seating for more than 25 avatars with a

podium and video screen), office space (desks with individual chairs), public sandbox (Land permissions allow for building by visiting avatars and is publicly advertised), private sandbox (land permissions do not allow for building by visiting avatars and is not publicly advertised), roleplay space (a setting that has been constructed for such activities as mock trials), space for student projects, space to give and receive course assignments, dance clubs, apartments or housing for avatars, art galleries, and other spaces. All 170 institutions were searched by the second author. The first author searched 23 of the 170 institutions for reliability assessment.

D. Intercoder Reliability

Percent agreement for all variables ranged between 69.6% and 100% (See Appendix A). While agreement is generally high, variation in the percent agreement may reflect the ever-changing nature of the space as well as the complexity of the virtual location. Those locations that had more content and were larger were more difficult to search than smaller locations or those with less content.

IV. RESULTS

A. Content

Overall, of the 170 institutions examined, 120 institutions (70.6%) had a group in Second Life, and 71 institutions (41.8%) occupied land in Second Life. The majority of the institutions (68.8%, $n = 117$) were physically located in North America in real life, (112 in the United States, and 5 in Canada), followed by Northern Europe (18.2%) including 26 in the United Kingdom, 2 in Denmark, 2 in Finland, and 1 in Ireland. Of the 71 institutions that occupied land in Second Life, 48 institutions (67.6%) were located in North America in real life (44 in the United States and 4 in Canada), followed by Northern Europe (16.9%) with 8 in the United Kingdom, 2 in Denmark and one each in Finland and Ireland.

Thirty-two institutions (45.1% of those that occupied land) occupied at least one full island, and one institution (Ohio University in Athens, Ohio, USA) occupied 7 islands. The average square meters (in Second Life terms) for institutions with less than one whole island was 2076 sq. m.

Land characteristics

Of the 71 institutions that occupied land, most (76.1%, $n = 54$) were branded with the institution's official logo on signage, plaques, or other visible markers located in the virtual location. Many of the institutions (47.9%, $n = 34$) had a welcome, greeting, or other information sign or marker. The most common greeting was by notecard (38.0% or 27 institutions). Several institutions (45.1%, $n = 32$) had sidewalks, pathways, road, or other types of footpaths visible in their virtual location. However, very few (9 institutions) had a map or diagram of virtual location. A number of institutions (45.1%, $n = 32$) had teleports to other locations in Second Life. Most frequently, those teleports were used to take an avatar to another place within the institution's own virtual space. Several institutions (46.5%, $n = 33$) combined the flat web with their virtual locations by providing clickable

links to various Internet websites. The three most common links connected the user to websites that 1) showcase institutional Second Life projects (75.5%, $n = 25$) 2) connect to the institution's main website (63.8%, $n = 21$) or 3) solicit enrollment of new students (45.4%, $n = 15$ institutions).

Land uses

Within the virtual locations, space was provided for a wide variety of activities from classroom space to art galleries. The most frequently found spaces included Private Sandboxes (36.6%, $n = 26$) and Auditoriums (36.6%, $n = 26$). Almost a third (29.6%, $n = 21$) had virtual space for art galleries. Over a quarter (28.2%, $n = 20$) offered virtual space for living quarter and offices. Other spaces identified in virtual locations included libraries, visitor centers, and resource centers. Spaces for socialization were also noted including bars, beaches, gardens, restaurants, and game rooms. Although actual events were only noted in progress once, evidence of a number of different types of events or activities were noted. Hybrid classes (25.4%, $n = 18$) were the most commonly found activity by educational institutions in Second Life.

B. Cases

Two institutions provided noteworthy examples of virtual locations that capture several components of campus life. These two institutions and their virtual spaces provide unique case studies to examine the use of 3D virtual worlds and Second Life in particular in an educational environment.

Case 1: INSEAD

As a leader in graduate business education with two campuses in France and Singapore, INSEAD prides itself in providing a "non-dogmatic learning environment that brings together people, cultures and ideas from around the world" (INSEAD, 2005). INSEAD's presence in Second Life embodies this belief and their institutional commitment to the entrepreneurial spirit – "willing to experiment and innovate; we are ready to take risks and manage the results of our actions" (INSEAD, 2005).

The INSEAD campus in Second Life is very open and inviting with very few closed-in areas. The entire virtual location carries a motif of openness and connectivity to nature with other open-air buildings, bridges that rise high above the land level, and plenty of natural vegetation and animal life. There are three main areas on the island: 1) the school and library, 2) the research lab, and 3) the public space and beach.

Avatars first arrive at the back of the Auditorium located in the school and library area. The Auditorium has seating for 36 avatars, a large panel in the front of the room which contains a chalkboard, a video screen and a large area for a visual display, and a podium. The ceiling is created to have a mesh-like appearance which allows the avatar to see the sky through the material and lacks walls on either side of the seating area. Behind the large panel, avatars may enter the library with plush seating for five avatars and clickable computer screens which take avatars to webpages for Second Life, the Linden Blog, and the Second Life Business Review.

Hot tea is available on the table in the library which also has no walls on either side of the seating area.

From the school and library, avatars may cross on elevated bridges to a central directional platform. From the platform that connects several bridges, avatars can see birds fly and hear their song. The platform identifies bridges to other locations on the island including the research lab and the public space and beach.

Upon approaching the research lab, avatars are offered a welcome notecard, which describes the nature of the research and provides a URL to the INSEAD website. As the avatar continues into the lab, a second notecard is offered which requests consent for avatars participating in the research. The avatar must indicate willingness and eligibility to participate by clicking on a button on the wall which teleports the avatar to research conditions.

In the public space, avatars will find clickable kiosks which offer notecards containing information about INSEAD as well as links to INSEAD webpages. These links provide connection to information on the various programs offered at INSEAD, Distance Learning at INSEAD, alumni services, and career services. Past the kiosks, avatars may sit in a number of circular chairs for reflection and conversation with other avatars. Past this area, avatars may follow a bridge which descends into a bar where avatars may enjoy a drink, obtain a free INSEAD t-shirt for their avatar, listen to the radio, and sit in several chairs. From time to time, bubbles appear floating in the air.

Case 2: Ohio University

Ohio University (OU), located in Athens, Ohio with five regional campuses in Southeastern Ohio, provides a strong liberal studies education for over 16,000 undergraduate students as well as rigorous and distinctive graduate programs in nearly all of their major academic divisions. Steeped in tradition as the oldest public institution of higher learning in the state of Ohio, Ohio University's Without Boundaries (OUWB) Second Life campus combines the old with the new as they bring their campus into the virtual environment.

The convergence between tradition and innovation is apparent at the entrance to OU's Second Life campus. Two signs are located just outside the archway to the virtual campus; one sign offers a notecard for the Ohio University Second Life Campus Community Standards and Privacy Statement and the other sign distinguishes the campus as a place of historical significance, identifying the names of the first graduates in the Northwest Territory¹ and Cutler Hall as the oldest building of higher education in the Northwest Territory. Avatars enter the OUWB campus under the Alumni Gateway, a replica of the same archway found on the real world OU campus. Just past the archway, a teleport map of the OUWB campus can be found. This map provides teleports to eight different locations in the virtual space including Stocker Center, Welcome Center, Art and Music Center, Classroom and Meeting Center, Learning Center,

¹ The Northwest Territory was a governmental region in early history of the United States which included the contemporary states of Ohio, Indiana, Illinois, Michigan, Wisconsin, and part of Minnesota.

Student Center, Featured Game, and a Sandbox. At the time of this writing, the teleport to the Stocker Center was not functioning. However, all other teleports were operating.

A click on the teleport Map of the Welcome Center takes avatars outside of the OUWB's campus to a small, circular location just outside of the Alumni Gateway. At the Welcome Center, four video screens which display video of OU's learning communities initiative. In order to return to the campus, avatars must travel back past the Alumni Gateway.

The Art and Music Center provides gallery space for artists. At the time of this writing, a resident artist at the real world Ohio University had installed a work in progress which incorporated literature, visual art and media design.

Classrooms with seating for up to 25 avatars and conferences rooms were found in the Classroom and Meeting Center. The exterior of the building had a texture of red brick while the interior had a very contemporary design with ramps descending to classrooms on a lower level and other ramps leading to lofts with couches.

Kiosks and poster displays of e-learning activities were available at the Learning Center. There were many windows and a very contemporary design to the entirety of the building, both the interior and exterior.

At the Student Center, many different student activities could be enjoyed. Ramps descended down to a lower level where pool tables, a stage with a microphone, and a coffee shop were located. The lower level also had a patio which contained a number of kiosks announcing real world local entertainment events. From the main level, ramps ascended to a group meeting room which could be reserved for student organizations. From this plateau, other ramps led to a second level which housed a student video lounge, vending machines, and a reading area. The entire back wall of the Student Center consisted of pane glass through which avatars could see the back patio and various trees.

A teleport to the Sandbox led avatars to a small building where avatars must select to take either an elevator or a teleport to the actual building location. After using the elevator or teleport, avatars arrived at an elevated space with the land texture of sand. However, building was only permitted to certain avatars. Although any avatar could visit the Sandbox, only those with permission could actually build objects.

The teleport map also contained a connection to a featured game. At the time of this writing, the featured game involved selecting food from different fast food restaurants built on the OUWB campus to simulate real world fast food restaurants. The object of the game was to learn about the nutritional value of food and make healthier choices in the real world.

V. DISCUSSION

Instructional technologies continue to grow with each new innovation. Early adopters see its potential and make attempts to harness it. Later adopters follow in the paths of those before them. As can be seen from the literature, crossing the "chasm" relies on sound practices established by early adopters, and communicated both horizontally and vertically.

This study attempts to provide a glimpse of the trail left by the early adopters.

Most of the public early adopters were educational institutions in North America, particularly the United States. When institutions do invest in public virtual space in Second Life, most seem to occupy an island rather than join the main continents.

Several land characteristics were commonly used by early adopters. Official signage and logos from institutions clearly marked the institution which creates a connection to real world locations and draws on the visualization possible in a virtual environment. Many institutions greet visitors with signage or a notecard which invites the avatars to enter the virtual location. Although a number of institutions created pathways to indicate directions from one building to another, very few posted a map of the virtual location. Many of the institutions combined new and established technology by providing clickable links to "flat" Internet webpages. This may be one way to connect with later adopters by providing links to familiar content and technologies.

Early adopters are finding new uses for space in Second Life. While many educational institutions had space for teaching including sandboxes, auditoriums, and art galleries, a number of unique building spaces were found among the early adopters including libraries, restaurants, visitor centers, and resource centers. As Second Life continues to be populated with more residents, it will be interesting to see if educational institutions continue to support socialization through student centers, games rooms, and open beaches. As might be expected from innovators, a few faculty members have offered credit-courses fully immersed in Second Life. More have offered hybrid classes which still involves risk-taking characteristic of early adopters.

Finally, among the case studies, differences can be observed which distinguish each campus' offerings. Through this analysis, two different types of educational campuses have emerged; an operative virtual campus environment and a reflective virtual campus environment. INSEAD's virtual campus functions as a working campus, where learning, research, and communication take place completely in a virtual environment that could not exist in the real world. This provides an example of an operative virtual campus environment; one that maintains the institution's mission, creates a virtual location unlike its physical campus, and actively executes educational functions primarily through the virtual environment. INSEAD is an exemplar of this virtual university, particularly with the building structures that are not likely to be replicated in the real world such as auditoriums and libraries without walls. Ohio University, on the other hand, provides an example of a reflective virtual campus environment; one that affirms the institution's spirit, reproduces its physical campus in the virtual world, and actively connects the virtual campus to the physical real world. In many ways, Ohio University's virtual campus reflects its physical location by virtually reproducing actual architectural elements and creating brick-and-mortar buildings similar to those on its physical campus. These buildings and elements serve as a signifier of the institution's pride in their historical significance. Furthermore, the student center on

OU's virtual campus is an example of connecting the real with the virtual through providing space for campus organization meetings, and kiosks of information about local events. Both of these campuses are very complex and well maintained, yet each campus provides a distinctive model for how to represent physical institutions and conduct educational activities in virtual environments.

VI. CONCLUSION

According to a leading technology research firm, within four years, 80 percent of active Internet users will participate in virtual worlds [22]. Linden Lab has already seen tremendous growth in the same amount of time from 500 residents in a 1-square-kilometer space in 2003 to over 600 square kilometers of space with over 6.9 million accounts created in 2007 and growing [23]. As early adopters, educational institutions already engaged in these technologies provide direction for future development of these tools. This study attempts to examine the path these institutions are setting.

Clearly, there are limitations in this type of analysis. The sample may not accurately reflect all educational institutions participating in Second Life. This may be the result of a number of factors. First, the educational institutions listed on the SimTeach.com wiki grow daily. Therefore, the sample must be taken into the context of the time frame in which the list was generated. Second, land owners must pay a fee to advertise their location on the Second Life "Search" tool. Therefore, any land owner who chooses not to pay the fee will not be shown in search results. Third, land and group names are set by each individual owner. Therefore, it is possible that groups or locations that do not use the official institution's name or use acronyms (such as UC for University of Cincinnati) may not be located. Finally, just as with any study of the flat web, virtual worlds are ever-changing and what might be found at one moment may not be found ever again. While this study is not flawless, it does provide a baseline for consideration of this new trend in application of technology for educational purposes.

Future studies should be conducted to track these early adopters and their impact on later adopters. Furthermore, technology specialists, faculty, and administration that support these virtual locations should be contacted to uncover their trials and triumphs with this technology.

New technologies often bring with them hope of "pedagogical utopia" [9]. While it is still uncertain what virtual worlds such as Second Life will bring to educational innovation, there is little doubt that instructional technology will continue to grow as the "Net" generation – those born around the time the first PC was introduced and who have grown up with technology [24] – become future faculty themselves. These early adopters and innovators have begun to uncover the utility and the limitations of these new innovations. As such, they build knowledge of viable educational functions within virtual environments and foster innovation in other institutions as they draw on these examples for their own endeavors. Whether institutions exist as operative or reflective virtual campus environments, both

provide avenues for educational experiences in virtual worlds. Future research should consider the impact of these different types of experiences for the institutions as well as for those who participate in their virtual environments.

APPENDIX A

Intercoder Reliability

Variable	Percent Agreement
Institution's official logo	78.3%
Welcome/Greeting sign	82.6%
Map/diagram of the virtual location	91.3%
Sidewalks, pathways or footpaths	95.7%
Chat-based greeting	82.6%
Notecard greeting	78.3%
Tourbot	95.7%
Tour HUD	100%
Teleport within the same virtual location	82.6%
Teleport to another educational institution	91.3%
Teleport to another institution that is not affiliated with an educational institution	87.0%
Link to institution's main webpage	87.0%
Link to new student enrollment webpage	91.3%
Link to institution's distance learning webpage	95.7%
Link to webpage for alumni	100%
Link to campus newspaper	100%
Link to institution's real world projects	87.0%
Link to institution's Second Life projects	87.0%
Link to webpage created by a real world journalistic organization about the institution's Second Life project	100%
Link to webpage created by a Second Life journalistic organization about the institution's Second Life project	100%
Classroom space	78.3%
Auditorium space	95.7%
Office space	82.6%
Public sandbox	87.0%
Private sandbox	87.0%
Theatre space	91.3%
Role-playing area	82.6%
Student projects	69.6%
Giving of assignments	78.3%
Taking of assignments	100%
Dance clubs	95.7%
Living space	73.9%
Art gallery	82.6%
Events in progress at time of search	100%
Hybrid classes	73.9%
Classes conducted completely in Second Life	73.9%
Public Second Life classes	82.6%

REFERENCES

- [1] College of Communication, Ohio University, The GRID Lab: The Game Research and Immersive Design Lab [Online]. Available: <http://gridlab.ohio.edu>.
- [2] University of Bath. Media Technology Research Centre [Online]. Available: <http://www.bath.ac.uk/media/>
- [3] New Media Consortium. (2006, August 1). About the NMC [Online]. Available: <http://www.nmc.org/about>
- [4] C. Lagorio. (2007, January 7). Pepperdine in a treehouse. *New York Times*, Section 4A, p. 22.
- [5] Campus Computing Project. (2000, October). *The 2000 National Survey of Information Technology in US Higher Education*. Available: <http://www.campuscomputing.net/pdf/2000-CCP.pdf>
- [6] New Media Consortium. (2007, March 8). *2007 Horizon Report*. [Online]. Available: http://www.nmc.org/pdf/2007_Horizon_Report.pdf
- [7] E. Rogers, *Diffusion of innovations*. New York, NY: Free Press of Glencoe, 1962.
- [8] G. Moore, *Crossing the Chasm: Marketing and Selling Technology Products to Mainstream Customers*. New York, NY: Harper Business, 1991.
- [9] W. H. Geoghegan, "Whatever happened to instructional technology" presented at the 22nd Annual Conference of the International Business Schools Computing Association, Baltimore, MD, 1994
- [10] Long Now Foundation, (2006, November 30). Interview at the Cowell Theatre in San Francisco, CA with Philip Rosedale [Online]. Available: <http://fora.tv/searchresults.php?keywordsearch=rosedale&page=1>
- [11] Second Life (2007, July 25). Second Life [Online]. Available: <http://secondlife.com>
- [12] Long Now Foundation, The North American Premiere of 77 Million Paintings by Brian Eno [Online]. Available: <http://www.longnow.org/77m>
- [13] Guardian Media, Secondfest [Online]. Available: <http://www.guardian.co.uk/secondfest>
- [14] Red An Orchestra, [Online]. Available: <http://www.redanorchestra.org/secondlifehome.cfm>
- [15] The Second Life Best Practices in Education: Teaching, Learning, and Research 2007 International Conference [Online]. Available: <http://slbestpractices2007.wikispaces.com/>
- [16] Dell, Dell Enters the Metaverse [Online]. Available: http://www.dell.com/content/topics/global.aspx/corp/conversations/en/2006_11_14?c=us&l=en&s=corp
- [17] M. Gross, (2006, November 3), It's My (Virtual) World. *New York Times*, [Online]. Available: <http://travel.nytimes.com/2006/11/03/travel/escapes/03second.html>
- [18] A. Reuters, (2006, November 9), IBM accelerates push into 3D virtual worlds. *Reuters*, [Online]. Available: <http://secondlife.reuters.com/stories/2006/11/09/ibm-accelerates-push-into-3d-virtual-worlds/>
- [19] Alliance Library System, [Online]. Available: <http://alliancelibraries.info/secondlife.htm>
- [20] B. Read, (2006, August 29), Second Life keeps chugging along. *The Chronicle of Higher Education*, [Online]. Available: <http://chronicle.com/wiredcampus/article/1529/second-life-keeps-chugging-along>
- [21] G. M. Lamb, (2006, October 5), At colleges, real learning in a virtual world. *USA Today*, [Online]. Available: http://www.usatoday.com/tech/gaming/2006-10-05-second-life-class_x.htm
- [22] Gartner. (2007, April 24). Gartner Says 80 Percent of Active Internet-users will have a "Second Life" in the Virtual World by the End of 2011 [Online]. Available: <http://www.gartner.com/it/page.jsp?id=503861>
- [23] W. Roush. (2007, July/August). Second Earth. *Technology Review* [Online]. Available: http://www.technologyreview.com/printer_friendly_article.aspx?id=18911
- [24] D. G. Oblinger and J. L. Oblinger. (2005, June 23) Educating the Net Generation [Online]. Available: <http://www.educause.edu/educatingthenetgen>