
TECHNOLOGY AND TEACHING

Using Virtual Worlds in Education: Second Life® as an Educational Tool

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The online virtual world Second Life (www.secondlife.com) has multiple potential uses in teaching. In Second Life (SL), users create avatars that represent them in the virtual world. Within SL, avatars can interact with each other and with objects and environments. SL offers tremendous creative potential in that users can create content within the virtual world, including buildings, environments, and objects. Psychology instructors can use SL as a space to meet with students, and to create labs, buildings, and objects that can be used to learn psychology content and skills. Students' engagement with course content and sense of community with the class can be enhanced using interactions within SL. Potential drawbacks include learning time required and technological issues involved in using the program. We suggest that instructors using SL formulate clear objectives, start with simple activities, and involve their students in designing and assessing learning activities in the virtual world.

Text messaging, blogging, online discussion groups, social networking sites, and other interactive technologies are a part of the daily lives of many faculty and students. Increasing numbers of students are enrolling in online classes (Allen & Seaman, 2007). Social networking sites such as MySpace and Facebook are used by large numbers of college students, with Facebook reporting more than 100 million active users as of September 2008 (www.facebook.com).

Online interactive technologies have the potential to reach students at home, in their dorms, in between classes and work, and on the weekends. One technology that has the potential to engage students in online interaction is the use of virtual worlds, or multiuser

virtual environments (MUVES). In a virtual world, the user creates an “avatar,” a character that represents him or her in a simulated space. Avatars can move through the virtual world, and can interact with each other and with objects in the world. A common use of virtual worlds is in massively multiplayer online role-playing games (MMPORGs) in which each player creates an avatar that participates in various “adventures” and activities in the game. Examples include the popular games World of Warcraft and Halo 3.

Educators have begun to examine teaching and learning in several of these virtual worlds, including There, Active Worlds (Dickey, 2005; Peterson, 2006), and Whyville (Neulight, Kafai, Kao, Foley, & Galas, 2007). Virtual worlds might be useful tools in online teaching because of their ability to engage students in interactions with the instructor and others in the class as well as with their environment. Interactions in a virtual world can help to build a sense of community in classes that otherwise might not meet in a face-to-face setting (e.g., see Steinkuehler & Williams, 2006).

The most active virtual world in higher education is Second Life (www.secondlife.com). Second Life (SL), which launched in 2003, is operated by Linden Lab. Currently, several million people worldwide have used SL, and typically 50,000 to 65,000 people are logged on at any given time. SL is an international community, with users from around the world. Although SL has many similarities with MMPORGs, SL, like Active Worlds or Whyville, is not a game. It is best thought of as a space for social interaction. Avatars in SL interact; travel to places in the SL virtual world; join social

groups; and attend musical performances, social events, and lectures.

SL and Education

More than 100 universities in the United States and other countries rent or own virtual land in SL. Faculty use these spaces to hold lectures or meetings with students, display digital artwork, hold music performances, host gatherings, and build virtual environments. 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.

One aspect of SL that has considerable potential for its use in education is that SL users can create content in the virtual world, including objects, buildings, furnishings, and landscapes. SL currently is host not only to numerous university campuses, but also to several museums and galleries, including virtual recreations of the Sistine Chapel (on the SL campus of Vassar College), and the Dresden Museum. SL "residents" created all of these environments.

Numerous educational groups exist in SL. Some groups, such as the International Society for Technology in Education, or the New Media Consortium, are real-world groups that have active operations in SL. Some groups hold education-related conferences in SL. An active educator's listserv (Second Life Educator's mailing list; SLED) serves as a resource for educators in SL, and SL also hosts an education-related wiki.

Getting Started in SL

To get started in SL, users must go to the SL Web site (www.secondlife.com), download the SL software, and establish an account. A basic account is free, although users may pay for a premium account that enables more privileges in SL, such as land ownership.

After establishing an account, new users must first create an avatar. SL provides a selection from a number of standard avatars. Once an avatar is created, the user can change and customize virtually any characteristic

of his or her avatar at any point, including body size and proportion, hair color and style, facial features, and gender. Obviously, users can choose an avatar of a different gender, body type, or color than their physical body; users can also choose to have a nonhuman avatar.

The first stop in SL for new avatars is Orientation Island, which includes tutorials on basic activities in SL, including how to travel through the virtual world, how to change appearance of one's avatar, and how to communicate with others while in SL. After completing the tutorials, one can then travel to any point in SL and begin exploring and using the virtual world. In SL, avatars can move through the world by walking, running, flying, or "teleporting" to a desired location. Communication can occur via the chat interface (typing conversation using the keyboard) or using the voice feature.

Costs for using SL can vary greatly, from essentially no costs to several thousand dollars. Anyone can establish a basic account and have access to the virtual world at no cost. Basic objects and clothing are available for free, and finding publicly open space, such as a park or a coffee shop, in which to meet with groups of students in SL is not difficult. Faculty who wish to establish a "virtual campus" as a more permanent, dedicated meeting space in SL must rent or purchase virtual land. Costs can vary from several hundred to several thousand dollars, depending on the amount of land and the complexity of the campus design. Linden Lab often provides discounts to educational institutions. The SL Web site provides more information about purchasing land.

Teaching and SL

One obvious use of SL is as a meeting site for instructors and students. Instructors can hold office hours or arrange meeting times with online students who otherwise do not meet face to face. Instructors can deliver lectures in SL that can be attended by student avatars. Holding SL lectures or class sessions might be most useful for students in online classes who otherwise do not interact face to face with the instructor or each other. Even students in face-to-face classes can enjoy the convenience of meeting in SL because they do not need to travel to campus to meet. Several science-related sites in SL (e.g., the Elucian Islands, the SL home of the journal *Nature*) have active lecture series and sponsor social events, although at this point there do not seem to be similar activities directed specifically toward psychology.

To date, there are few specific psychology-related sites in SL. One of these, the University of Derby's SL-Labs, focuses on teaching and research in psychology; projects at this site examine the use of virtual worlds in the teaching of psychology. At another site, the "virtual hallucinations project" attempts to re-create aspects of perceptual distortions experienced by persons with schizophrenia. Avatars enter and move through a building in which objects change appearance; disembodied voices are also heard throughout the area. Other possibilities exist for using SL as a teaching tool for psychology. For example, instructors or students might build a virtual re-creation of an important historical venue (e.g., a working recreation of Pavlov's lab), or a large-scale model of the brain and nervous system, or an "avatar-sized" operant chamber.

For psychology students, virtual worlds provide an interesting platform for research on computer-mediated social interaction (e.g., Vail et al., 2008). Within SL, it is possible to create simulated environments or situations and observe the behavior of avatars within these contexts. To the extent that behavior is similar in virtual-world and real-world environments, virtual worlds present an opportunity for research on many aspects of behavior (Bainbridge, 2007; Schroeder, 2002; Sherwin, 2007). For example, Yee, Bailenson, Urbanek, Chang, and Merget (2007) examined interpersonal distance between male-male, female-female, and mixed-gender dyads interacting in SL. They found that dyads interacting in SL show similar patterns of interpersonal distance to those exhibited by dyads interacting in the real world. Researchers have also examined social facilitation and conformity in virtual environments. Results indicated that these processes operate in similar ways in the "real" and virtual worlds, and that participants respond to avatars in virtual environments in ways that are similar to how people respond to others in face-to-face interactions (see Blascovitch, 2002).

Advantages and Disadvantages

As with any new technology, SL has both advantages and disadvantages. One obvious plus is that using SL exposes students to a new technology. Online virtual worlds might increase in popularity in the future as a means of social networking, and SL is a means of providing students with experience interacting in such a virtual world. Using an online virtual world such as SL may increase student engagement, particularly for online classes, by providing oppor-

tunities for real-time, (virtual) face-to-face student-faculty and student-student interaction (e.g., Childress & Braswell, 2006).

In some cases, a student who is reluctant to comment or ask questions in class might feel more comfortable doing so in a virtual world. The use of an avatar can provide a layer of semianonymity that enables some students to feel more comfortable speaking up. When discussion in SL occurs using the chat function, users can see a record of the discussion as it is occurring. This might allow less outgoing students the opportunity to review the discussion and formulate their ideas before commenting. The instructor and students can save the text of the discussion for later review, and can share it with students who were not present.

One potential positive outcome of using SL, which might not be immediately obvious from the instructor's point of view, is that SL can provide a platform for more informal interaction between students and faculty. Traveling to architectural sites, visiting art galleries and science museums, and attending music performances with an instructor are all possible (and convenient) for students in SL. Two of the authors (Wentz and Woods) are students who used SL as part of a small-group independent study project exploring the potential use of SL and virtual worlds in the classroom. We found that the informal setting of SL seemed to allow students to feel comfortable interacting with the instructor as well as other students. In SL, we felt at ease having everyday conversations with the instructor, which carried over into real life and led to a strong sense of engagement with the class.

Use of SL also has limitations and drawbacks. Instructors must assess whether the benefits of using SL outweigh the potential costs. There is some learning time involved; students and instructors have to invest time up front creating avatars and learning how to navigate and communicate in the virtual world. Most students report that they are able to download the software, create an avatar, and learn most basic operations within an hour; however, this process is longer for some. There are also technological requirements; SL requires more than a basic computer. Complete system requirements are listed on the SL Web site. As with many new technologies, SL does not always work as planned and technological glitches can cause problems and delays.

Student willingness to try new technology needs to be weighed. Some students do not enjoy online interaction, and some might have anxiety about learning to use SL. These issues are also relevant for instructors who are considering using SL or a similar virtual

world in teaching. Like students, instructors vary in their level of enthusiasm for learning new technologies and the speed with which they learn them. For some instructors, SL might not be a good option due to the amount of time needed to become comfortable working in the virtual environment. Other existing technologies allow for online, real-time discussion. Although some data exist comparing avatar-mediated interaction with text-based or audio-only interaction, it is not clear how interaction in a virtual world compares to other forms of online interaction or to face-to-face interaction, and how these differences impact teaching and learning (e.g., Bente, Rüggenberg, Krämer, & Eschenburg, 2008).

Instructors might need to develop new class management techniques. For example, discussions in SL can become complicated at times due to the delay incurred while participants type out comments and responses. Multiple overlapping conversations can occur simultaneously, which can become confusing. Instructors need to formulate procedures for managing group discussions in SL.

Also, as is the case for many online social networking sites, security issues must be considered. Students need to be informed about appropriate behavior and safeguarding their privacy while interacting in SL.

Evaluation

We collected qualitative feedback from a group of 9 students in an upper level psychology class who attended a lecture in SL to gauge student reactions to SL. Reactions from the students were generally positive. Students appreciated the convenience of being able to attend the lecture from any location. They also liked having the text version of the lecture available during the talk, so they could easily review earlier sections of it. The students suggested several potential uses for SL, including holding evening review sessions in SL so that students and faculty do not need to travel to campus. They noted that SL could be especially useful for students who are prevented from attending class due to constraints such as illness or distance from campus. Many of them noted that they enjoyed interacting socially with the instructor and with their fellow students in the virtual world. Despite these positive aspects of SL, a few students also had technical difficulties. One student reported having a slow computer connection, and another was not able to view the slides during the lecture. Most students reported that it took some time

and practice before they felt comfortable navigating through SL.

Suggestions for Using SL

Do Not Send Students in to SL Without Some Educational Objective

Prepare educational objectives for student learning activities in SL, and share these objectives with the students. This is good practice for any class assignment, but might be especially true for one in which students are trying a new and unfamiliar activity. An appropriate analogy might be visiting an unfamiliar city. If you do not have a map, some information about the area, and a plan for what you will do, confusion or boredom might result. Explaining why SL is an appropriate technology for the class or the assignments is also a good practice. What skills are students learning and practicing as they are using SL?

Be Prepared for the Unexpected and Have a Contingency Plan

No technology is completely foolproof. Engaging in course activities and doing assignments in a virtual world can pose unexpected challenges when the technology does not perform correctly. Help students to be patient, and explain the exploratory nature of SL to them. Have a contingency plan for situations in which technological glitches interfere with an assignment or class activity. Communicate your plan to students; this can save them anxiety if things start failing during the assignment. For example, your plan might be to continue the work via e-mail or an online discussion board, or to meet again in SL at a later time.

Prepare Students for the Social Experience

Because joining SL is free and open to anyone with an Internet connection, SL has some similarities to a public square. SL is a diverse community, and students may meet people from other countries or cultures. For some types of course activities, this can be a powerful advantage to the use of SL. Although avatars, rather than people, interact in SL, it is important to remember that there is a real person behind every avatar. Students should understand that, just as in real life, some people they meet will be helpful and friendly and others will not. Make sure students know how to avoid places or

leave unwanted interactions, and that they know how to interact appropriately in the virtual world.

Start Small

Using a new technology can be intimidating, so it can be useful to start with simple introductory exercises. As an introduction to SL, students might visit an educational or university site, or attend a cultural or entertainment event, and write a summary of the event along with a discussion of problems or issues they encountered. Students can post their summaries on a class discussion site for other students to read and comment on. Students might also be required to take a snapshot of themselves at the site and post it to a class Web site.

Send Students in With a Partner

Assigning students to complete exercises in pairs can be helpful for students who might be hesitant to try new technologies. Having a teaching assistant that students can meet with in SL to help them “learn the ropes” might also be helpful.

Make Students Your Learning Partners

Involve students in designing learning experiences in SL. Students can provide excellent feedback about activities that are effective or ineffective from their perspective.

Spend Time in SL Yourself

Before you send students in to SL, spend time there yourself. Explore and attend events, concerts, lectures, and discussions. Learn to shop, dance, and change your appearance and clothing. Try doing things the students are likely to do.

Connect With Other Users of SL

Connect with users on your own or other campuses. Join the SLED list. Visit virtual campus sites in SL and seek out contacts. Join an SL education-related group, attend their functions, and meet others who are using SL.

Consider SL to Be One Tool in Your Toolbox

No technology works for every course activity in every class. SL is one tool that might be appropriate

for some assignments, for some classes. Be prepared to explore and try new things; be creative.

Assess the Efficacy of SL

The examination of the use of virtual world in teaching is still in the early stages. Instructors using this new technology can make important contributions in this area by evaluating its impact on learning.

Conclusion and Future Directions

The use of virtual worlds such as SL in the teaching of psychology comes with both costs (primarily learning time and potential technology issues), and benefits (potential for student engagement; ability to create environments and objects). Many of the potential benefits and uses of virtual worlds in teaching have yet to be examined. Does interaction in a virtual world such as SL increase student engagement in an online class? Does interaction in a virtual world impact students' sense of community with the class? Are less talkative students more likely to engage in discussion in a virtual world than they would be in a face-to-face class? How does interaction in a virtual world compare to other types of online interaction, such as discussion boards, instant messaging, or e-mail? Which learning activities are effective in virtual worlds and which are not? How can virtual worlds be used to provide learning options that are not available in some face-to-face settings?

Clearly, many questions need to be addressed before we understand how this technology can best be used to facilitate learning. SL presents many interesting opportunities for instructors interested in exploring the use of this virtual world in teaching.

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Notes

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