



Second Life and Education

by [Rachel Gollub](#)

Introduction

Second Life is a three-dimensional interactive virtual world that has been making the news frequently this year. It is based on a game engine, but expanded to allow more natural social interactions and user-created content outside the restrictions of a game. It has a self-contained economy of Linden dollars (at last check, the exchange rate was L\$270/US \$1), themed simulations created by users, and over four million registered users, with over 20,000 logged in at any given time [3]. Users are represented by completely customizable avatars.





Figure 1: Chatting in Second Life.

The reasons people log in to Second Life are highly varied. Some enjoy the dance clubs and social scene, others run thriving businesses that allow them to convert their earnings to real money outside the environment, and yet others are using it for education, academic research, artistic expression, and a myriad of other purposes. The possibilities for educational and academic use, particularly in the realm of science and technology, are enticing. While the fact that Linden Lab is a privately held company has created obstacles for academic institutions, their recent release of the client software as open source, and the impending follow-on release of the server software, ensures that academic institutions can make full use of the resources they provide.

New objects in Second Life are created through building, which is done through a relatively intuitive interface, and scripting, which allows the user to attach scripts in Linden Script Language (a Java-like language) to any built object. The combination of these with a realistic physics engine creates nearly unlimited potential. Combined with an avatar's ability to fly and teleport, it provides the setting for imaginative and fascinating hours of construction.

Technologically, Second Life is still slightly ahead of its time. Building is done through primitive objects (prims), and the number of prims allowed on a given piece of land is

limited, because of the processing power required to track and render the items. Only twenty avatars can coexist simultaneously on a given themed simulation (sim)—any more and the sim slows down enormously, and can become unusable.

Despite an excellent support team, the grid is periodically down because of attacks, server failures, or bugs, and the time it takes for users even with high-bandwidth connections and powerful graphics cards to render a scene can be slow enough that conversation lags or objects fail to be drawn properly. Users with older machines, or those who can only access Second Life through Internet cafes, academic computer labs, or simply in remote locations with slow connections, can find Second Life nearly unusable. This exclusivity creates a fascinating situation; with the high level of interest and potential, what can be done with Second Life now in an academic setting, and what can be done in the near future?

Academic Use

The two most common academic uses currently are teaching classes and building libraries in Second Life. To teach a class in the virtual Second Life world, referred to as **inworld**, faculty are renting or buying space, buying or building models of the subject they intend to teach, and inviting the class to meet partially or entirely in Second Life. Some professors are encouraging their students to explore Second Life and interview other residents about their experiences. A few students are developing thesis material from specific aspects of the environment.

Teaching inworld has a number of advantages: the professor can illustrate points visually as well as verbally with minimum effort. A chemistry professor's animation of an excited electron, or a simulated discussion with a fictional or historical personage are two examples of the advantages of teaching inworld. Distance learning becomes much more feasible when students from around the world can log in and interact as if they were sitting next to each other. The limits on bandwidth and avatars can be handled by keeping the environment simple, and leaving out most construction other than what is needed to teach the course effectively. When a virtual class requires a three-dimensional representation of a molecule, it can dispense with the chairs, tables, and elaborate decorations, to make the environment more accessible by remote users.

Although current limitations may hinder other disciplines, they provide some interesting additional opportunities to students and faculty of computer science, since we can participate in creating and improving the environment itself. The open source

client provides an opportunity to build a more efficient viewer for Second Life, and to experiment with and learn about client architecture and optimization.

The similarity of Linden Script Language (LSL) to other programming languages makes it easy to learn, and provides the opportunity to script increasingly complex and innovative tools that can be used by other departments to help teach their classes. The limits on prims and avatars can be used as a teaching tool to practice efficient programming techniques. One can solve problems from the simple (create a chair out of one prim) to the complex (what is the minimum amount of prims and scripting needed to create a working physical model of a waterfall?).

LSL also has a number of useful interfaces to avatars (through the `llListen` function) and the web itself (`llHTTPRequest`), allowing scripting to expand to include web resources and complex interaction with other residents. Second Life presents a compelling environment for computer-related teaching and learning, and an opportunity to experiment in a way that was previously rare and difficult.

There are dozens of current classes and educational uses of Second Life. One example is Harvard's ground-breaking class, [Law in the Court of Public Opinion](#). This unusual course is an attempt to create a class that includes Harvard law students, extension students, and the general public, all with different expectations and degrees of involvement. The multimedia nature of Second Life is used both to teach the class more effectively for students of all types, and to provide a number of easily available media through which to use the class techniques.

This class is being taught through [Moodle](#), an online course management system, which has its own presence in Second Life, called [Sloodle](#). The Sloodle system provides inworld classroom space, resources, and tools that connect directly to Moodle, adding a new dimension to the power of online education.

One of the odd aspects of Second Life is the visceral feel that one is face to face with the other people involved, to an extent unmatched by email, instant messaging, or telephone. Courses taught in Second Life capitalize on this togetherness and provide an online environment in which widely geographically separated people can enjoy an experience that comes as close as currently possible to replicating the social aspects of the classroom, while taking advantage of the environment to create the visual demonstrations mentioned above. These visual demonstrations can range from the

simple (a static image of a geometric solid for a geometry class) to the incredibly complex. Some fascinating examples of the ideas that have been implemented in Second Life include the [International Spaceflight Museum](#), the [Splash Aquatics Deep Sea Aquarium](#), and Aimee Weber's [real-time weather visualization system](#). For more information about educational initiatives in Second life, an excellent reference can be found at [the Simteach website](#) [4].

The library system is also benefiting greatly from the use of Second Life. Led by the [Alliance Library System](#), there is a growing academic library presence in Second Life, with new resources and projects appearing daily. The opportunities for making library resources of all kinds available in Second Life, including text, images, geospatial data, video, audio, and social information, is drawing librarians inworld at a rapid pace.



Figure 2: The Marie Antoinette library exhibit.

The visual, three-dimensional aspect of Second Life allows libraries to duplicate more of the feel of a real-life library online, rather than simply pages of search boxes and text, while still providing the modern advantages of browsing and searching metadata and social tags. It also allows opportunities to create communities around subject areas or projects. A special collection can be housed in its own building in Second Life and decorated in a coordinating theme, with links to real life, online, and Second Life

locations containing more information. People can meet in the nonthreatening realm of virtual subject collections, and form their own associations based on shared interests. Virtual coffee houses and gardens have proved to be convenient places for library patrons to meet and compare notes, without the risk of spilling food on rare collections. In some ways, the advantage of Second Life is that it unites the traditional patrons, who are looking for a realistic and familiar library feel, with Internet-age patrons who are interested in easily browsing metadata, comparing recommendations, and bouncing between sections and other activities at will in a single, easily navigated environment.

The Info Island Archipelago is the most extensive and well-developed library system in Second Life. Created by Alliance Library System and sponsored by SirsiDynix, they offer a network of libraries, free and low price resources for academic and public libraries, and space and support for libraries and academic institutions to experiment and grow.

The [Mystery Manor](#) is one example of the concepts mentioned above. Built as a haunted house, it holds the full text of a number of famous horror and mystery novels, and links to a number of related places, both inworld and online. It is an excellent place to host book club meetings and book signings, both of which are held with some frequency there. The built-in haunted house sound effects, visual effects, and atmosphere not only add to the experience, but give a clear indication of the content of the library building.

Another recent Info Island exhibit demonstrates some of the educational and community-building potential of virtual libraries. The Marie Antoinette exhibit (Figure [2](#)) featured a hall decorated in the style of her times, full text and links to books and multimedia presentations about her, and an event that featured an avatar carefully crafted to resemble her speaking in person about her life and experiences. It was followed by a period costume ball.

This combination of library resources, educational experience, and entertainment introduces a new direction for both libraries and educational institutions in the future. Rather than leaving the educational location (whether a classroom or web page) to reach an information source (a library or online catalog, or even Google), Second Life demonstrates a way to combine all of them in a compelling way in the same targeted experience.

The Future

If Moore's law holds true, Second Life will not be at the bleeding edge of technology for long. As server power and bandwidth increase, more possibilities will open up around Second Life use. The open source server will allow private sims to be built by various institutions, and they can be powered by as many servers as the institution requires, allowing much more flexibility in building and population. The private sims can be easily connected to public sims via Second Life URLs, taking advantage of the powerful social nature of Second Life without tying it to a commercial entity or restricted performance. This increase in ubiquity and power will allow Second Life and related three-dimensional simulations to develop more realistic looks and interfaces, with more powerful tools for communication and interaction.

One can easily imagine a more immersive environment. Ray Kurzweil's book describes several scenarios for building full sensory environments with offshoots of today's technology [[1](#)]. Second Life is already a great boon to those with physical disabilities. One can only imagine the kind of experiences people will be able to have as the technology improves. Finally, and possibly most importantly, technologies like Second Life provide people with a chance to try out living very different lives. Avatars cross gender, race, and cultural lines, blurring the differences that can be obvious in real life interactions. The social implications of a more powerful and immersive environment are immense, and could change the way we see each other in a way that was previously unimaginable.

There are other aspects to Second Life that provide fascinating hints at what the future might bring. The first artificially intelligent agents (AIs) capable of interacting with the residents are appearing in Second Life by linking modern artificial intelligence engines into avatars. Some are obviously designed to appear artificial, while others attempt to pose as real people. As the engines get better, the distinction between residents and AIs becomes more blurry than it is in real life [[2](#)].

The thriving economy, which allows real people to make a living by designing virtual items such as skins, clothing, and landscapes, indicates the powerful pull material habits exert on residents. While many have imagined that a virtual world would free us from materialism, Second Life presents a distinct counterexample. Apparently the lure of the perfect house, the perfect car, and the perfect body extends even to a world where they have no physical existence. On the other hand, if one is willing to settle for

something less than perfect, one can create almost anything. Many of the resources listed above were created through volunteer effort, with people previously inexperienced with technology learning to build and script their own environments through trial and error. This creates a new kind of equality. Rather than limiting certain resources to the wealthy, anything can be created with a custom style given enough time and effort. This puts technology and status in the hands of everyone who has access to a computer, creating more of a meritocracy than can be achieved in real life.

Second Life holds a special place in the course of online experience. Though it is far from the first technology to attempt this kind of virtual environment, it may be the first to be at the right place and the right time to bring this kind of system from the realm of fiction to a solid place in human history. The enormous hype surrounding the project has only served to bring it much-deserved attention, and the decision to release the components to open source has ensured its place in the history of three-dimensional virtual environments. Now is an excellent time to experiment with this technology, and the opportunity exists to participate in bringing these environments from the edge of technology into the mainstream of daily life.

References

1

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3

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4

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Biography

Rachel Gollub is the manager of development and research for the digital library systems and services group at Stanford University. Her Second Life avatar is Dirisha Utu, and she can frequently be found roasting marshmallows on Eduland.