

# Virtually Augmented Classroom Curriculum

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**Abstract.** This poster will detail step-by-step instructions for building a virtually augmented classroom curriculum for an undergraduate college course. Information will be provided on choosing a virtual environment, defining the parameters of a virtual course assignment, training students and instructors on using a virtual environment, setting up the virtual environment (e.g., installing applications, running a private or public server, hosting solutions, etc.), and grading a virtual assignment. Best practices will be discussed and the results of a qualitative study using undergraduate students and a virtual course assignment will be presented.

**Keywords:** Second Life, OpenSimulator, virtual environment, curriculum.

## 1 Why Virtual Environments are Great Teaching Tools

Virtual Environments (VEs) allow for the creation of realistic 3d representations of real world environments which can be interacted with and explored in real time (Cobb et al., 2002). Virtual environments serve as unparalleled teaching and learning tools for a number of reasons. According to Smokowski and Hartung (2003) virtual environments allow the instructor to personalize the content and user experience of an assignment; VEs enable students to learn from potentially unlimited repetitions of a target skill; VEs promote internalization of knowledge and application of key skills; VEs emphasize responsibility; and VEs allow the instructor to collect and record process and outcome data in real-time. Additionally, virtual environments allow students to become a community of learners where they can learn together, collaborate on tasks, and share knowledge. Finally, virtual environments as well as other electronic screen media, foster student engagement and increase motivation during tasks.

## 2 Determine the Virtual Environment to Use

A number of virtual environments are available to choose from for building a classroom curriculum. The environment chosen depends on the scope of the course assignment; the technological expertise and willingness to learn of the instructor and students; and the time and monetary investment that one can make. Two major virtual environments used in higher education are Second Life<sup>®</sup> (SL) and OpenSimulator.

## 2.1 Second Life

Second Life<sup>®</sup> is a multi-user virtual world created by a company called Linden Lab. Second Life<sup>®</sup> is free to use, does not require a large amount of technical expertise, and there are over 100 educational institutions (i.e., colleges, universities, and K-12 schools [http://wiki.secondlife.com/wiki/Second\\_Life\\_Education\\_Directory](http://wiki.secondlife.com/wiki/Second_Life_Education_Directory)) with a presence in Second Life. SL is easy to set-up; simply visit the download webpage (Fig 1. <http://secondlife.com/support/downloads/>) download and install the Second Life Viewer, which will allow you to view and interact with other users and objects within Second Life. After installation, you will be asked to create a username and choose an avatar that you can later customize (see Fig. 2). In SL you will be able to simulate anything that is possible in real life and a myriad of additional things only limited by your imagination, building (creating objects), and scripting (programming) skills.

**Pros and Cons.** Advantages of using SL include support from Linden Labs for academic institutions; a large user base with many support groups, forums, and wikis; a number of marketplaces and individuals to purchase pre-made objects, buildings, etc. from; ease of installation, set-up, and use. Drawbacks to using Second Life include the cost of buying and maintaining land; issues regarding ownership of intellectual property; little support for 3<sup>rd</sup> party 3D viewers; and the need for an internet connection to access the environment.

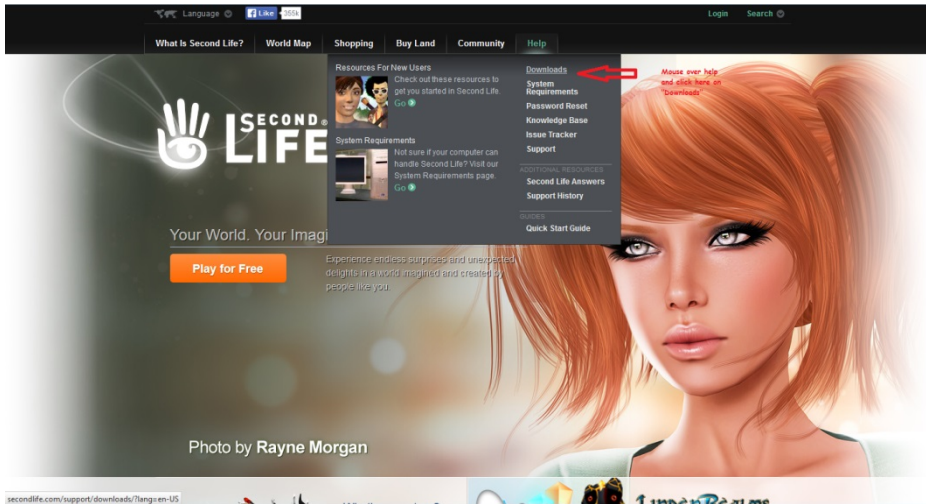


Fig. 1.

## 2.2 OpenSimulator

OpenSimulator (OS) is a free, open-source multiuser 3D virtual world platform. OpenSim can be used as a standalone virtual environment and run off of a single computer or a “grid” which can be used to connect to other public OpenSim virtual

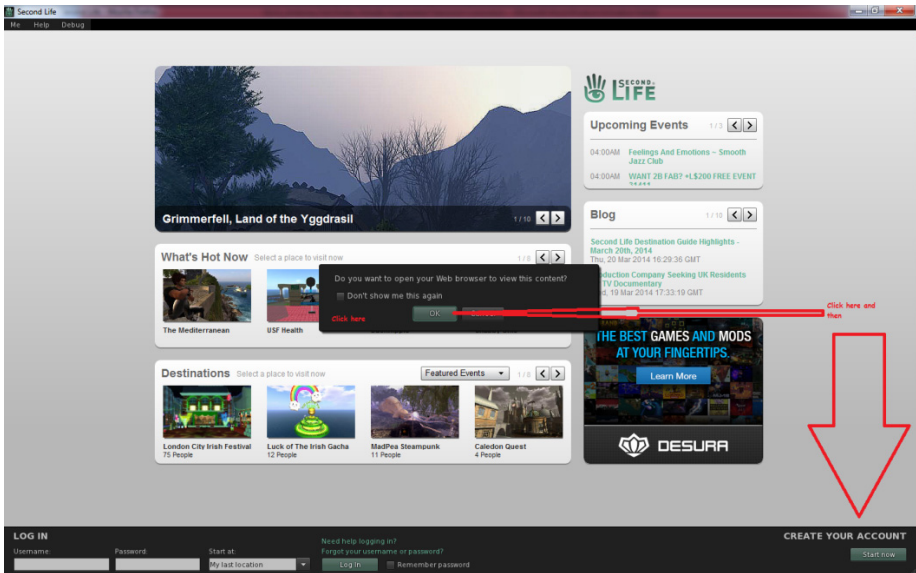


Fig. 2.

spaces. In standalone mode, you can have a single user or a limited amount of multiple users access your virtual space through your computer's address. In grid mode, you can set-up a MySQL server or use a variety of other hosting options to have multiple users access your virtual space. To download OpenSim simply select the appropriate binary package from <http://opensimulator.org/wiki/Download> (see Fig 3) and make sure that you have the appropriate dependencies (required software) installed for your operating system by checking the list at this link: <http://opensimulator.org/wiki/Dependencies> Be sure to keep track of your username and password for your local account. After installing OS and running the application (see Fig 4), you will need to download a viewer to view the 3D environment. The most popular viewers are Firestorm, Eclipse, and Imprudence; a list of viewers can be found here: <http://opensimulator.org/wiki/Connecting> When the viewer is installed, you must launch it and then choose whether you will be accessing OS locally or connecting to a public grid. You have the option of setting up your own server to make your grid accessible to multiple users and hold a large amount of regions (virtual space). One good guide for a MySQL install can be found here: <http://opensimuser.wordpress.com/2008/07/16/opensim-mysql-install-guide/>

**Pros and Cons.** Advantages of using OpenSim is that it is free to use; OS can be modified if you download the source code; you own everything that you create and there is no cost to import or export your creations; you can run a virtual world without the need for an internet connection; OS can be run off of a thumb drive (<http://becunningandfulloftricks.com/2010/10/07/a-virtual-world-in-my-hands-running-opensim-and-imprudence-on-a-usb-key/>); and there are low-cost hosting options available. Disadvantages of using OpenSim include the large amount of documentation

required to understand how to set-up and use the program and a 3D viewer; the large amount of technical expertise required to run your own grid that can accommodate multiple regions and users; conflicting sources of information or a lack of documentation for issues within the OS community; and difficulty of finding support or troubleshooting help for issues.



Fig. 3.

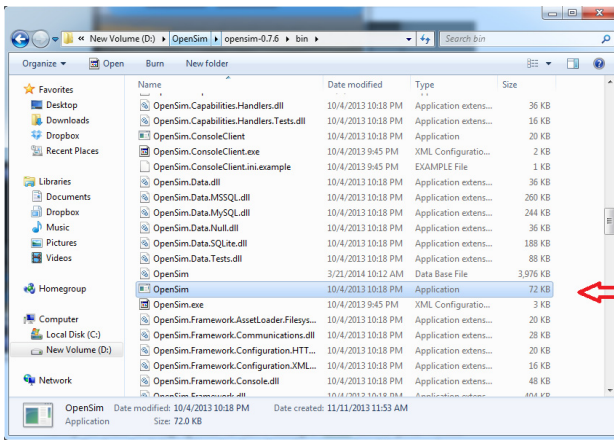


Fig. 4.

### 3 Curriculum Best Practices

It is important to know the scope of the class assignment; your student’s comfort level and experience with virtual spaces; what student work will be required; and how you will grade students on their work. Instructors should survey their students on their prior experience and comfort level with using similar environments and using technology in their academic and personal lives. It may be helpful to pair experienced students with inexperienced ones to ensure completion of the course assignments. Students should be given a tutorial on how to navigate the virtual environment and how to complete simple tasks such as walking, running, flying, using chat, and using

gestures. One best practice to facilitate student work is to create a group both within and outside of the virtual environment for students to discuss issues, ask for help, and share tips. Another best practice is to have class sessions dedicated to tutorials on skills required to complete the class assignment. Even though OpenSim and Second Life are two separate environments the skills needed in both (building and scripting) are the same. There are many resources within SL to learn building and scripting that you and your students can use such as Builder's Brewery; The College of Scripting, Music, and Science; and the Ivory Tower Library of Primitives. It is important to check in with students periodically and have them report on their progress on the course assignment. Lastly, as with all courses, it is important that students are aware of what is required of them of the assignment and how they will be graded (e.g., paper, inworld project, etc.).

## 4 Conclusion

Using virtual environments in the classroom is not difficult; Second Life and OpenSimulator are two virtual world options for instructors to consider when they are interested in including a virtual component to their courses. While these environments do have some drawbacks, the number of advantages greatly outweighs the costs and they have the potential to enhance and improve instruction for any course.

## References

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