

From Multi-User Virtual Environment to 3D Virtual Learning Environment

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ABSTRACT: While digital virtual environments have been utilized in education for some time, advancements in technology have fueled a recent spike in interest in vastly multi-user 3D virtual worlds for enjoyment, which has led to an increase in interest in their educational uses. In this article, we look at how virtual worlds are being used in education, from casual learning to formal teaching, and what it takes to transform a virtual world from a Multi-User Virtual Environment to a fully-fledged 3D Virtual Learning Environment (VLE). This article focuses on the creation of Sloodle, a system that combines the popular 3D virtual environment of Second Life with the open-source learning management system Moodle. Our goal is not only to introduce more learning support tools to Second Life, but to look at how integrated virtual worlds may improve teaching and learning in general, which is the topic of our last conversation.

KEYWORDS: Multi-User Virtual Environments; Virtual Learning Environments; game based learning; Second Life; Immersive Virtual Worlds

1. INTRODUCTION

There has been a recent significant increase in interest in the use of online graphical Multi-User Virtual Environments (commonly known as MUEs) for educational reasons, as shown by this special issue of ALT-J devoted to learning in Immersive Virtual Worlds (IVWs). However, IVWs were not planned or constructed with teaching and learning in mind, and many aspects of learning and teaching assistance that are now ubiquitous in web-based Virtual Learning Environments (VLEs) are totally missing. While it is certainly feasible to utilize an existing VLE in conjunction with a graphical IVW, we think that combining the two may help turn a Multi-User Virtual Environment into a real 3D Virtual Learning Environment, which is what the Sloodle project is aiming towards. Sloodle includes a development project that integrates the Second Life IVW with the Moodle VLE. In this paper, we'll go through the history of the app, how community feedback was used to shape the design to suit the requirements of educators, and the results of current Sloodle pilot work. The second half of the project is to look at how the mainly text-based web might be effectively combined with rich, graphical 3D immersive worlds. This more generic approach, which could be applied to any combination of IVW and VLE, is a critical element of the debate that concludes this article[1].

Since the late 1970s, online multi-user virtual worlds have existed — originally based on written descriptions of the world and the characters that inhabit it (Achterbosch, Pierce, and Simmons 2007). The ability for users to expand and alter the virtual environment emerged with the development from the original Multi-User Dungeon (MUD) to subsequent MUD Object Oriented (MOOs). Several educational initiatives have been created throughout time that utilize text-based virtual worlds to promote student, teacher, or workplace community building and information exchange, as well as to teach topics ranging from classics to computer science. According to recent Eduserv Foundation polls, more than half of UK higher education institutions currently have some kind of Second Life presence or engagement. However, just a few IVWs have been created especially to serve educational goals. At this point, consider the early usage of the internet in education as a corollary example. The widespread use of web-based e-learning necessitated the creation of VLEs to support and simplify common e-learning management, instructional, learning, assessment, and communication activities[2].

Many educators would likely find it more difficult to successfully use the web and provide e-learning in the absence of settings specifically designed for education. What kind of e-learning assistance may be found in IVWs? IVWs, in contrast to VLEs, enable synchronous interactions and collaborations, as well as immersive settings for experiential and constructionist learning. IVWs, on the other hand, don't enable asynchronous collaboration (when students are online at various times) and don't help with learning management, evaluation, or reflective practice. However, there are a few instances of learning assistance being added to existing IVWs. First, we'll look at the River City Project and Quest Atlantis, both of which were created utilizing the Active Worlds framework. Active Worlds is an IVW that has been around since 1995 but now seems to be out of date. Active Worlds divides the user interface into many sections by default, as seen in the River City Project picture.



Figure 1. The various interactive components in the River City/Active Worlds user interface are labeled in this figure. The 'Student Workspace' is shown in a web browser window that is part of the Active Worlds UI.

The view and action space includes controls for the 3D camera and the user's avatar, with the avatar and surrounding space shown in the second area. A chat box appears below this, with written conversation messages to and from other avatars. Despite being labeled as a "Student Workspace," the last section is really a web browser integrated into the interface. Active Worlds, like other IVWs, was not designed as an e-learning platform; instead, the River City Project's creators incorporated learning assistance through a separate website that can be visited via the built-in browser. Students using the virtual environment will find a guide, a notebook, a map, resources, and assistance on the website. Using built-in guides and notebooks for organized notetaking has been shown to promote more effective use of CD-ROM e-learning materials by providing a learning narrative over student interactions. While the River City Project has its own story, it's easy to see how the use of guides and notebooks may assist scaffold, organize, and concentrate attention on the learning activities - rather than the mechanical tasks of navigating and exploring a 3D environment[3]. Quest Atlantis utilizes a similar approach, offering a custom-built interface in the web-browser window to assist learners engaged in project tasks, despite its aesthetic differences. The Quest Atlantis support interface is intended to resemble a computer game user interface, with a prominent display of the amount of collected 'lumin' crystal awards and a variety of colorful buttons for accessing information about current quests, friends lists, personal information, and more[4].

1.1 Sloodle:

Many people see the need for improved support for e-learning in 3D virtual worlds, and it has been raised in many polls. For example, integrating Second Life (which is synchronous) with other Web 2.0 technologies (e.g. wiki, forum, etc.) is essential. Sloodle's main idea is to integrate a VLE – particularly Second Life with the open-source Moodle VLE – to provide flexible assistance for teaching and learning in 3D virtual environments. Because of its popularity, versatility, and passionate community of educators that utilize the platform, Second Life was chosen as the IVW of choice. The Moodle VLE was chosen because to its open-source nature and the fact that it has a sizable online community behind it. Sloodle was originally intended to offer a 3D "virtual classroom," providing access to a Moodle course in 3D and automatically replicating the course's web layout. Each of the various components that make up a course would have a 3D counterpart that avatars could interact with. As an example, a 3D calendar would emphasize key dates; clicking on them would read out event details to students, or an assignment might be shown moving closer to the deadline by having a flag descend a pole as the due date neared. These ideas were creative, despite the fact that they were not based on real-world teaching experiences in Second Life, and there was no feedback from prospective users to establish actual needs.

They concentrated on the Moodle layout structure's aesthetic qualities and directly translating user interface affordances. Information about the user[5]. For this, a variety of methods and utilities have been explored, with the most popular being a basic "registration booth." In Second Life, this appears as a tiny 3D kiosk. When a user selects this, a popup appears, directing them to their institution's Moodle VLE's avatar registration page. Because users must log into Moodle to view this website, a link of their Second Life avatar information may be created and saved against their Moodle credentials. This is accomplished using a mix of new scripts running on the Moodle server and Second Life programmed objects. The former are written in PHP Hypertext Processor

(as is Moodle) and may be added to Moodle like any other optional module. The latter are 3D models with scripts written in the Linden Scripting Language of Second Life (LSL). Sloodle does not make any changes to the Second Life client software[6].

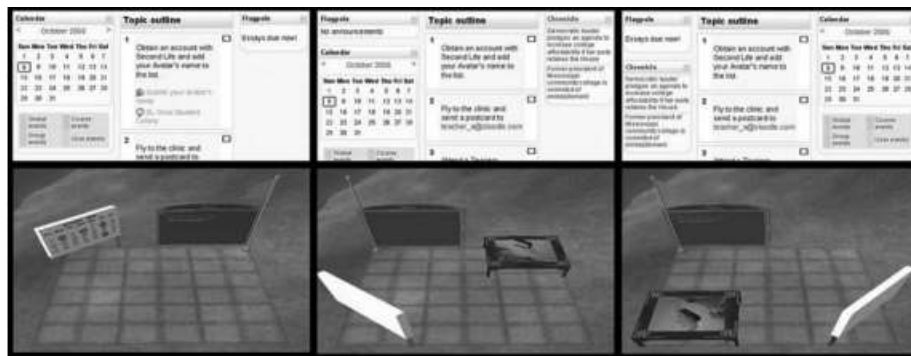


Figure 2. The Sloodle classroom allows you to create 3D Moodle courses.

1.1 User-driven development:

Sloodle development started in late 2006 with the construction of a variety of proof-of-concept demonstration components in Second Life, including the ones shown in Figure 2 and an early prototype of the web-intercom. After a series of demonstration events in Second Life, a Moodle website was created as the project's online home, complete with forums and courses for creators and prospective users. Following that, an online poll was conducted to assess demand and modify Sloodle needs. While the response rate was modest, the feedback, coupled with attendance and remarks at demonstration events, convinced us that Sloodle was in demand. Regular online project meetings and a variety of online forums continue to offer opportunities for the community to contribute feedback and suggestions. Work on the project continued, and in late 2007, a second, more comprehensive online survey was performed. The majority of respondents rated nearly every proposed feature as being at least "quite helpful," indicating strong demand. Indeed, more than 60% of respondents considered several aspects to be at least "extremely helpful." The survey's findings confirmed many of the development choices made in the previous year, as well as highlighting future development objectives[7].

1.2 The Sloodle pilot: During the creation of Sloodle, a small group of early adopters – including some of the Sloodle developers – used the tools to assist their teaching. During the first several months of 2008, a more official pilot was performed. During the pilot, participants who wanted to set up Sloodle for their own courses were provided assistance, including a ready-to-use Moodle/Sloodle server. At Sloodle.org, a special course was created to assist the pilot, including information about the pilot and a conspicuous reminder that pilot activities might be utilized in research. Regular guided conversations, in addition to forums, were conducted as a key component of the pilot activity, led by either members of the Sloodle development team or pilot participants sharing their experiences and encouraging debate.

The sessions' themes were all based on previous teaching and learning experiences in virtual worlds. These were created to enable participants to talk on the effect of different problems and the potential role of integrated VLEs in Second Life education. Some of the sessions were conducted by pilot participants, who were able to discuss their experiences using Sloodle in their courses. In Second Life, written conversation was archived via the web-intercom during live meetings. Audio recordings were maintained whenever voice communication was utilized for subsequent transcription. Individual privacy and confidentiality have been maintained, but we are grateful to those participants who are willing and able to share their experiences more publicly, as seen in the example below. Rather of continuing with this, work has moved to the construction of a collaborative web-browser to expand the extremely limited capability for displaying web-content accessible in Second Life. Two noteworthy enhancements above regular capability are the ability to share control of a virtual mouse and the ability to utilize hyperlinks in web pages — Second Life's usual HTML display is restricted to a non-interactive picture of what the website looks like[8].

1.3 Novel applications of existing features:

The most encouraging feedback from any pilot is when users are effectively using technologies in ways that the creators did not anticipate. The goal of the Sloodle Second Life distribution boxes was to allow teachers to give out or students to choose whatever Sloodle tools they wanted for their avatars through a web-interface in Moodle. One participant suggested filling a distribution box with avatar clothes, cars, furnishings, and toys,

allowing students to customize their avatars with a variety of pre-selected "goodies." Students found this to be a fascinating and interesting class exercise as they investigated the materials provided and exchanged and discussed what they discovered[9]. It also offered a setting for the language students to practice their English by allowing them to inform each other about the items they had discovered. The same participant spoke about how he was able to inspire his language pupils by connecting them with students from different countries. The two sets of students have used Moodle's mp3 audio forums to ask each other questions, participated in live video link-ups (again, controlled by a Moodle plug-in), and ultimately met and text-chatted in Second Life. Students may practice their written language abilities in a real-time conversational environment with the text-chat, which has been recorded utilizing the web-intercom. A final advantage enjoyed by the KAIST class was having a single VLE that supported all learning activities, regardless of communication channel. Moodle became the glue that held a broad variety of activities together, with Sloodle serving as a support[10].

2. DISCUSSION

Survey responses, pilot comments, and general involvement in Sloodle.org forums all show that respondents believe there is a genuine need and need for better integration of web-based learning assistance with Second Life. Despite the fact that the program is still in its infancy, a community of educators that are interested in and utilizing Sloodle to improve teaching and learning in Second Life is forming. We're currently gathering and analyzing data that shows how Sloodle can assist learning and teaching in Second Life – and that's helping to drive Sloodle's continuing growth. Educators are the most knowledgeable about the most effective environment in which to construct an educational narrative that is tailored to their intended learning objectives and teaching methods. Tools have been utilized in ways that their creators had not intended, and observations of educators' innovations are flowing back into the tool's design in an iterative loop. Asking educators whatever technologies they think would be helpful for learning and teaching isn't enough, as the pilot experience demonstrates. We need to develop prototype tools and see how they are utilized in the field. The ability to browse web sites from inside Second Life seems to open up new possibilities, but most VLEs are built on limiting access to those who have the right rights. If Moodle material is to be presented in public areas in an IVW like Second Life, there are a lot of problems to address. While the collaborative web browser enables groups of users to share a 3D conversation area in the IVW while viewing websites together, there are still concerns about how this might or should be utilized with Moodle.

3. CONCLUSION

As IVWs become more widely utilized in education and learning, problems of providing effective support for teaching and learning are expected to arise across a variety of platforms and settings. While discrete and independent technologies may be used for such assistance, more integration is needed to fully realize the promise of today's 2D and 3D learning environments. Individual educators dealing with IVWs do not have the resources to do this. With the development of Sloodle, an open-source project that integrates Second Life with Moodle, we tried to solve issue for one of the most popular IVWs. We've discovered significant evidence of demand for tools like Sloodle, as well as proof that Sloodle is already proving helpful to a number of schools, thanks to the continuing pilot. We're still collecting comments and suggestions from educators to help drive the development of new learning tools, and we're hoping that this will enable Sloodle to become more helpful to a wider range of educators. Sloodle's software, like Moodle's, may be freely copied, changed, and redistributed, taking use of both the Open Source development paradigm and the Second Life platform's inherent capabilities. Educators and learning technologists may customize and alter the Sloodle environment to fit their own personal and institutional needs. The transition from customized (and sometimes costly and proprietary) learning games to bottom-up, participatory platforms parallels the development of blogs and social networking systems elsewhere on the web. Sloodle will facilitate this shift by making it simpler for IVWs to become fully integrated components of institutional e-learning strategies and systems.

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