

# Gaining Insight into the Application of Second Life in a Computing Course: Students' Perspectives

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**Abstract.** As educational delivery methods have changed over the years, often through enhancement by technology, new and innovative strategies have been introduced to enhance learning. Virtual worlds such as Second Life are being used as an educational tool in many domains and for a variety of purposes. To gain a further understanding of the use of virtual worlds in the classroom from a student's perspective, the authors discuss the feedback gained from students about their participation utilizing Second Life in a computer course. Pre and post surveys were distributed to the class to get student's feedback. The responses from these surveys are reported in this paper.

**Keywords:** Virtual Worlds, Second Life, Education, Perception, Educational Tools.

## 1 Introduction

As virtual worlds and their technological counterparts (i.e., video games, interactive multimedia and other forms of virtual and augmented realities) become more common place, they can be used for much more than entertainment purposes alone. These technologies can be used to extend the capabilities of the traditional classroom to create a more immersive and interactive educational environment. As we begin to increase the use of virtual worlds as part of instruction, it is important to assess the perception of effectiveness as a learning tool by the students. Perception of a tool such as virtual worlds can often affect its use and adoption in an educational context [1]. The application of this particular technology in the classroom can have an impact on how students and educators react to it, and their willingness to use it for course-related activities. In this paper, the authors outline their preliminary work and discuss feedback collected from students regarding their participation in Second Life© in a computer course.

Second Life (SL), like many other virtual worlds, is a 3-dimensional internet-based interactive space where users can communicate in real-time through visual

representations of themselves, called avatars. It is through these avatars that users can build objects, socialize, interact within the environment and “view” the world. Avatars can be created in many different forms and representations, allowing for a diverse variety of visual representations [2]. Unlike many variants of virtual reality, Second Life does not require expensive gear to interact within its environment; one can use the platform by using traditional hardware (i.e. keyboard, mouse, monitor, headsets) increasing access to average users. Students can use Second life in the classroom or on their home computer for class activities or at-home projects. The content within Second Life is almost entirely created by the users, where user creativity is encouraged. Built-in modeling tools can be used to create detailed objects and shapes enhancing many ideas and concepts. One can even use many different types of external programs like Blender, Plopp or 3D Studio Max, to create textures and elaborate graphics to enhance designs. Virtual goods and services can also be bought and sold using Second Life’s virtual currency called the Linden dollar which can be exchanged for real US currency on the Lindex Market exchange, enabling users to link real accounts to their virtual accounts. Second Life and similar platforms have often been referred to as a “3D-Web” and pointed out as a possibility of the future of online interaction. Teaching inside a virtual world not only provides students the means to be immersed in real-time scenarios that can be customized, but also allocates to them opportunities to interact with an online society that emerged from the technology they study in classes. Virtual classrooms are engaging to students as “Students engaged in educational games and simulations are interpreting, analyzing, discovering, evaluating, acting, and problem solving” [3, p. 116]. These virtual spaces provide a means to model complex systems and facilitate role-play simulations at a low cost [4].

Second Life has been used in many educational contexts across various disciplines in order to support and enhance learning [5]. In previous studies, students generally agreed that they did see potential educational benefits of using Second Life to enhance learning [6]. This led the authors to conduct further studies on the impact of virtual worlds/reality in educational contexts. In a related study, the professors used Second Life as a tool in several computer courses to teach students about decision making through virtual role playing activities with encouraging results [7]. In addition, Second Life was used to demonstrate the use of virtual worlds in real life case scenarios [8]. The authors wanted to gain insight on students’ responses on virtual worlds to begin investigations revealing concerns students have about using these technologies in the classroom. In the next section the surveys are discussed.

## 2 Methods

In order to begin to assess students’ perceptions related to potential concerns of course related use of Second Life, two surveys were administered to students enrolled in a course titled Computers and Creativity during the Fall of 2009. The main goal of this course is to teach students basic computer skills while emphasizing multimedia and the creative nature of technology (i.e. flash animation, web design and basics of multimedia applications). The general structure of the class contains both lab and lecture components. The course content and creative goals correlate with the

expressive power and creative nature of Second Life. Activities for this class included in-world student projects, virtual field trips, basic building and scripting. Second Life is also the basis for many class discussions. Second Life based Machinima (filming in 3D worlds) has also been incorporated into class discussion topics to illustrate filming techniques and video editing [9]. The typical audience of this course includes first and second year students from all fields of study.

Three sections of the Computers and Creativity course were given the pre and post surveys, with a total enrollment of 92 students. The purpose of pre-Second Life survey was to assess students' preconceived ideas about virtual worlds. At this point in the class, no information, discussions or labs had been related to virtual worlds or Second life. After this initial survey, the class spent two sessions discussing various aspects of virtual worlds and their impact on the real world. In addition, the class spent two lab sessions in Second Life learning to build objects, visiting areas of the environment and learning the features of the platform. After these Second Life class activities, the post-SL survey was administered to the same class sections to see if there was an overall change in student perception. The questions were the same as in the pre-SL survey, except for a few additional questions that were asked related to avatar appearance and their overall thoughts on Second Life. The pre-Second Life survey consisted of five questions and the post-Second Life survey consisted of nine questions.

### 3 Pre-Second Life (SL) Survey

From the enrolled students, 67 students responded to the survey for a 72.8% response rate. The average age for those responding was 19.8, with a male to female ratio of 28 male (41.8%) and 39 female (58.2%). Students had a variety of backgrounds when it came to declared majors and areas of study.

Question #1 asked "Do you have any prior experience with any 3D virtual worlds? (For Instance, Second Life, Sims online, WoW...etc) If so, which ones." From the responses, 9% answered "Yes" (6) and 91% (61) reported "No". Those that did note some experience, students noted that they had experience in virtual worlds such as: The Sims, Guildwars, World of WarCraft, Maplestory, IMVU, Gates of Andaron, and through Xbox Live.

Question #2 asked "Have you ever taken a class that has used a virtual world as part of classroom instruction or as a learning tool?". The majority responded "No", 97% (65) and 3% (2) responded "Yes". Of the two students who responded yes; one reported that they had participated in a class exercises for a business class in high school and the other noted they had been involved in an activity for an accounting class, but did not mention the actual environment. Question #3 asked "List any ethical concerns you have about Second Life or other virtual worlds". In order to assess initial thoughts on the subject, no information was given up to this point on these types of issues or anything related to computer ethics. From the respondents, 38 students (56.7%) gave no answer or wrote "no" or "none" on the survey. Table 1 lists student concerns and its respective frequency. Some students responded to more than one item. A post-SL frequency column has also been included to compare pre and post SL results. More detail about the post-SL questionnaire is documented in the later section.

**Table 1.** Concerns about Second Life or other Virtual Worlds

Concern	Frequency (Pre) 29 respondents 43.3%	Frequency (Post) 22 respondents 31.4%
Privacy Concerns	13	8
Detriment to Real Life Social Skills	7	3
Identity Theft	4	2
Social Issues/ Social problems (General)	2	3
Virtual Crime	2	0
Security	2	1
Addiction	2	3
Copyright infringement	2	1
Not being taken seriously	1	1
Online Stalkers	1	0
Encountering Adult content	1	0
“It scares me”	1	0
<i>Encountering Users with Malicious Intent</i>	0	1
<i>Speaking with Strangers</i>	0	1
<i>False Appearances</i>	0	1
<i>General Safety Online</i>	0	1

**Table 2.** General Student Comments on Online Behavior

General Student Comments on Online Behavior
“Anonymity allows people to do and say anything”
“Might be for those shy in RL” [Real Life]
“Yes, it’s more informal”
“Yes, you can be what you want online”
“Maybe because no one knows me”
“No, being online is just another way to be yourself”
“Possibly I would be more social”
“Not real, so I may act out differently”
“Maybe because I could do anything without people knowing me”

We asked students in Question # 4 “Do you think your behavior online would be different than your behavior in Real Life? Why”. From the respondents 34 students (50.7%) answered “Yes” while the 23 students (34.3%) said “No” and the remaining 10 (15%) answered “Maybe”. Table 2 above highlights the general comments associated with answers for this question from those who gave a brief explanation.

As a last question (Question #5), in order to understand what types of issues the students generally thought were important, five general concerns were listed randomly, which included: “Social Issues”, “Privacy Concerns”, “Network and Security Issues”, “Intellectual Property/ Copyright Issues”, and “Computer Crime Issues”. From the list of choices, students were asked to order these concerns from 1 (highest) to 5 (lowest). Table 3 lists the concerns and what the average ranking score was for all students. All respondents answered this question.

**Table 3.** Average Ranking of Listed Concerns for Pre-SL

<b>Listed Concern</b>	<b>Average Ranking</b>
Privacy Concerns	2.06
Networks and Security Issues	2.54
Computer Crime Issues	3.27
Social Issues	3.45
Intellectual Property/ Copyright Issues	3.63

## 4 Post-Second Life (SL) Survey

After these Second Life class activities, a secondary post-SL survey was administered to the same class sections to see if there was an overall change in student perception. The questions were the same as in the pretest, except for a few additional questions that were asked related to avatar appearance and their overall thoughts on Second Life.

For the post Second Life questionnaire, nine main questions were asked of the students. There were 70 student respondents yielding a 76% response rate from the total 92 possible students. The Average age from these students was 19.95 years old, with 35 students identified as “Male” (50%) and 35 students as “Female” (50%). Question #1 was in the form of a table, where students could select their choice for each question as presented in Table 4. The results of the student’s responses are summarized in Table 4.

**Table 4.** General Reactions to Second Life for Class Activity

<b>Question</b>	<b>YES</b>	<b>NO</b>	<b>Maybe</b>
Would you be interested in using Second Life for a class Lab / activity in the future?	41	15	14
Do you think virtual environments could have an educational benefit?	37	0	29
Rather use another tool / virtual world other than SL	8	31	31
Enjoyed using SL in class	59	5	6
Intend to use SL in the future (outside of class)	10	34	26

**Table 5.** Avatar Appearance

<b>Question</b>	<b>Very Important</b>	<b>Important</b>	<b>Somewhat Important</b>	<b>Not Important</b>
How important is <u>your</u> avatar's appearance?	4	15	32	19
How important is the appearance of <u>your friend's</u> avatar?	1	3	35	31
How important is the appearance of <u>a stranger's</u> avatar?	1	7	30	32
How important is the appearance of a significant others/ partner' avatar?	3	14	32	21

Question #2 was also presented in the form of a table where students could select the appropriate response. The authors were interested in the perceptions students had on the appearances of other avatars. Specifically, we wanted to know if students felt threatened by the appearances of anonymous users, or if they had an affinity towards higher quality avatars for making friends [10]. Additional research is needed in this area. Table 5 presents the results of the general questions of the importance of appearance.

In Question #3, students were also asked “Do you think you could feel threatened by the appearance of another avatar?” 9 students responded “Yes” (13%), 53 responded “No” (76%) and the remaining reported “Maybe” (11%). Some students commented on appearance stating that “Some appearance[s] could be offensive” and that appearance could relate to “stereotypes of how people appear”. One student commented that avatar appearance was something they did not feel was important because interaction in SL was “No different than an IM or chat session”.

In Question #4, Students were asked about their general feeling of safety while using Second Life. “How would you rate your level of safety while in Second Life? (1-Unsafe/threatened: 10-Very Safe)”. It was mentioned in class about safety concerns of virtual worlds (as with other online environments) not to reveal personal information and also to choose avatar names that were dissimilar to their real-life name and not to choose words that could identify them or their location. When asked to rate their level of safety on a scale of 1 to 10 (1-Unsafe/threatened: 10-Very Safe), from the 70 respondents the average rating score was a 7.74.

In Question #5, students were asked to list any difficulties they had with the SL platform. Many students left this question blank. For those that did have difficulty, Table 6 describes the problems noted. A frequency is noted for difficulties mentioned in some cases. These described difficulties are similar to previous studies [6].

Question #6 asked students “What did you like the most about Second Life?”. These items and frequency of responses are described in Table 7 below. Students were then asked in Question #7 what they generally disliked about Second Life. These items and frequency of responses are described in Table 8 below. Students were then asked in Question #7 what they generally disliked about Second Life. These items and frequency of responses are described in Table 8 below.

**Table 6.** Difficulties in Second Life

<b>Difficulty</b>	<b>Frequency</b>
Learning the controls	9
Confusing for new users at first	6
Appearance difficult to change/edit	6
Didn't know where to explore	3
Flying	2
Building things	2
Needed more time to learn	1
Teleporting	1
Difficulty getting the concept	1
Lag	1
Awkward to control	1

**Table 7.** Liked about Second Life

<b>General Comments</b>	<b>Frequency</b>
Flying / Ability to Fly	11
Being able to visit/ explore new places	10
It was a different/ unique experience	8
Freedom to be anyone / do anything	8
Social aspects	6
Graphics	4
Fun	3
Editing appearance	1
Other avatar's appearances	1
Building	1
Making a avatar	1
Easy to use	1
It's more fun than being in a real class	1
Whole other world online	1
Like a game but with more interaction	1

**Table 8.** Disliked about Second Life

<b>General Comments</b>	<b>Frequency</b>
Controls are difficult	5
Not into virtual worlds	4
Lag	3
Trying to figure out where to go / explore	2
Building	2
Too much to understand	1
Hard to focus on the task	1
I was bored	1
Graphics	1
Rather create things in real life	1
Security could be an issue	1
Different feel safe or protected	1
Creating an avatar/account	1
Movement	1
Complicated	1
Hard to understand	1
Wanted more time in class	1
Everyone in class can see what you are doing	1
Seems overwhelming	1
Couldn't change my clothes	1
Rude people	1
Characters look unreal	1
"It scared me a little bit"	1

The authors again wanted to see what types of concerns students had about Second Life or using virtual worlds and posed it as another question in the post-SL survey. Question #8 asked "List any ethical concerns you have about Second Life or other virtual worlds:" The results from the pre-SL questionnaire and post-SL questionnaire were different. To compare both results refer to Table 1.

In Question #9, the authors wanted to see what types of concerns from the same list as mentioned previously in question #5 in the pre-SL survey, was most important to the students after using Second Life. Again the same five general issues were listed randomly. Students were asked to order these concerns from 1 (highest) to 5 (lowest). Table 9 lists the concerns and what the average ranking score was for all students. All respondents answered this question. The only main change in the average ranking of these general concerns regarding differences were between “Social Issues” and “Intellectual Property/ Copyright Issues”. Previously Social Issues were initially ranked higher, but in the second assessment, it was listed as the least issue of concern. The other issues remained in the same order. The importance of students’ perceived concerns generally remained the same before and after interacting within Second Life. Table 3 compares the results from pre and post-SL questionnaire.

**Table 9.** Average Ranking of Listed Concerns for Post-SL

Listed Concern	Frequency
Privacy Concerns	2.11
Network and Security Issues	2.97
Computer Crime Issues	3.09
Intellectual Property/ Copyright Issues	3.16
Social Issues	3.66

## 5 Summary of Survey Results

As indicated in the above reported results, the feedback from the pre and post survey questionnaires provided basic insight on the impact of using Second Life as an instructional tool. In addition, the responses of the students indicated their perceptions on the application and use of this software. The purpose of this study was for instructors to gain insight on how effective the inclusion of Second Life technology impacted their computing course. However, the instructors were aware of some limitations surrounding this study. For example, the questions on the pre and post surveys can be more in-depth to cover more pedagogical issues; inclusion of analyses and testing of the data would have yielded stronger results; and a reporting of larger population (different types of computing courses) may have also yielded interesting results. In future investigations the authors propose by means of a pre and post SL survey to compare two separate groups of students with differences in class activities to see if there is a significant difference in responses. A major strength of this study is the feedback from students’ perception of using this technology. It is the opinions of the authors that while this study has limitations, it adds value for further examination in this area.

The feedback did yield interesting results which demonstrated that there were concerns related to the perception of virtual worlds as reported in Table 1. These main concerns were still present after interacting with Second Life, but reporting of these concerns was much less in the post-SL survey. In addition, as outlined by Table 3 and Table 9, the ranking of importance of the randomly selected issues, remained similar with both the pre and post surveys. Using this preliminary data as a starting point, we plan to conduct more in-depth studies on concerns related to virtual world usage.



## 6 Conclusions

As technology-enhanced learning increases in the classroom coupled with virtual worlds and other computer mediated environments, it is important to gain insight on the best practices using these types of mediums for the benefit of both students and educators. Cultivating on our experiences with implementing Second Life activities in the classroom from several types of activities has encouraged experimentation and potential improvement with these types of technologies. Not only has feedback from students been generally positive, usage in the classroom has generally been encouraging as students are interested in being engaged in learning from within a 3D space.

Using the results of this study as a preliminary baseline on the inclusion of Second Life in classroom instruction, we can begin to enhance our in-world activities by trying to overcome potential barriers; such as, misconceptions and concerns or technical / usability problems. The feedback from this study suggests that there are still many concerns that are held by students about interacting in a 3D world and it may take some time to dispel some of the concerns. While there is still much needed research in this area, from both a student and instructor point of view regarding overall successfulness in long term studies. Many of the questions posed in our surveys simply serve as a starting point for other research initiatives by the authors, as it is our intention to explore other areas of education and social interaction through virtual worlds. It is our hope that other educators will explore virtual worlds.

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