CONSTRUCTIVIST-BASED TEACHING IN SECOND LIFE FROM A STUDENT'S PERSPECTIVE: A MODEL PROPOSAL

By

SCOTT BLEDSOE * DAVE HARMEYER **

* Assistant Professor, Department of Graduate Psychology, Azusa Pacific University.
** Associate Dean, University Libraries, Azusa Pacific University.

ABSTRACT

This paper provides qualitative student-centered research from an online Research Methodology course taught partly within the immersive, 3-D environment of Second Life with fifty-eight graduate psychology students for the purpose of suggesting a constructivist-based instruction model for immersive environments. A qualitative method approach was applied through open ended questions, a satisfaction survey, the capturing of graphical images, student recorded perceptions and authors observations. Although the data was mixed on students' perception of Second Life as an effective medium for learning, the study showed that slightly more than half of participants (53%) found the experience positive and a large number (81%) felt that being part of a constructivist group in-world aided in the individual learning of research method concepts. With this in mind, a new teaching model for immersive environments is proposed.

Keywords: Virtual Environments, Online Learning Environments, Constructivist, 3-D Software, Second Life, Higher Education, Graduate Psychology.

INTRODUCTION

As more institutions of higher education provide quality distance education to a wider array of student learners, faculty are experimenting with online innovations beyond merely text-and-read-only or pre-recorded-video curricula currently used in synchronous and asynchronous modalities of online learning environments (OLE). This paper attempts to provide distance educators a new model of instruction through a qualitative description of one group of students' perspectives on their constructivist-based experience when taking part in a research methods course within an immersive, 3-D environment, namely Second Life (SL).

The authors were interested in applying SL as a tool for investigating a constructivist-based pedagogy as part of an online Research Methodology course in the Graduate Psychology program at Azusa Pacific University in Southern California during the 2011 spring semester. During two weeks of a nineteen week course, fifty-eight psychology graduate students were assigned to create their own avatars, embark on a number of group-based, constructivist-type virtual field trips and answer a series of research questions about their experience. According to Gray (1997), constructivist teaching and learning includes the following features: student-centered, process is the approach vs. outcome, involves negotiation, teacher as researcher, interactive, and shared responsibilities in the areas of decision-making, power and control (Gray, 1997).The online course objective for the SL field trip was to achieve three student goals (engage in group observation, apply research concepts to shared experiences, and answer a set of research-based question to be posted to group blogs) based on the student learning outcome of developing a basic understanding of how to plan and conduct psychological experiments within an immersive environment such as Second Life.

Literature Review

The literature demonstrates that 3-D online worlds are increasingly being used in higher education to teach in a number of academic disciplines to students who appear to be learning within a constructivist-type model at the same or increased levels of engagement compared to face-to-face learning. For example, Lansiquot (2009), when teaching an advanced technical writing course as a hybrid (face-to-face and online) class, found "Blending virtual communities" gave students, "a stronger purpose to write well and write to engage their peers" welcoming "the

use of new technology and commented on how it helped them to avoid the boredom in the classroom that they often experienced" (2009, p. 62). In a second study of slightly different results, Hobbs, Gordon and Brown (2006) observed the interaction of eight computer science students experiencing Second Life for the first time. The researchers found a large spectrum of differing behaviors including: (i) experienced a sense of non-engagement (the environment was simply not interesting), (ii) acted in SL as one would in real life (RL) but at a more adventurous level, (iii) regarded SL as only a game with no connection back to RL and (iv) experienced an environment with less social responsibility than RL (Hobbs, Gordon, & Brown, 2006). In a third investigation -- which included a SL virtual campus with collaborative zones, a common campus, lecture rooms and recreational areas -- De Lucia, Francese, Passero, & Tortora (2009), found that the environment successfully supported synchronous interactive communication between faculty and students as reflected in a participant's comments, "the distance between student and teacher is reduced: it is more natural, spontaneous and easy to communicate in SL" (2009, Conclusion para. 7).

Constructivist-Based Teaching in Second Life

A number of educators in higher education have used second life with different learning applications within a constructivist framework. Delwiche (2009) used SL to teach video-game design and criticism to thirty-six undergraduates, finding that students behaved at a high level of engagement and critical thinking, participating "in a [constructivist] community of practice as game designers. . ." and "discussed game mechanics, deconstructed the strengths and weaknesses of the Second Life environment, and successfully participated in professional forums maintained by professional game designers" (2006, p. 165). When using Second Life for an improvised role-playing activity, Gao, Noh and Koehler (2008) observed that undergraduate students produced similar amounts of communication in both online and face-to-face environments; but when in SL students took more turns, had shorter exchanges in each turn and generated more concept-related dialogues (2008).

In a case study by Good, Howland and Thackray (2008), students in a course on interactive learning environments were divided into constructivist-based project teams and assigned real business clients who then selected learning experiences to be completed by the teams inside SL. The authors found that after a period of avoidance and retreat into the familiar, several of the student groups began to do things "only possible in a virtual environment, such as creating a magic forest where works of art hung from the branches of trees, or building a large retail outlet and superimposing a layer – only visible by flying [easily achieved by SL participants] above the building – of systems diagrams relating to the operation of the store" (Good, Howland, & Thackray, 2008, p. 170).

In another investigation, Jarmon, Traphagan and Mayrath (2008), in the context of a graduate student course on interdisciplinary communication, found through survey results that the use of SL "substantially enhance the quality and experiences of student learning" and "that motivation and learning can increase when working with other [students] in a virtual environment due to their perceived social relationship" (2008, pp. 168–169). And as an indication of future student engagement, Joosten and Stoerger (2011) in a grant proposal, described a faculty workshop where participants would use Second Life to "increase student engagement, establish a presence, and build a learning community in their courses" for fall 2011 or spring 2012 terms impacting at least 500 students (2011, para. 9). Each of these descriptive reports conducted within SL seem to indicate a level of constructivist student learning and engagement that is at least similar if not more intense than that found in conventional face-to face classroom interactions.

Methods

This qualitative investigation included open ended questions, a satisfaction survey, the capturing of graphical images, student-recorded perceptions and authors' observations. Procedurally, students began by working in groups of three or four to engage in naturalistic observation (a psychology-based research protocol involving subjects in their natural environment) as they familiarized themselves with the Second Life environment. Next,

students applied research concepts to their shared learning experiences. Finally, students assessed their learning by answering a set of research-based questions and posting them to group blogs created earlier in the course.

As part of the process approach, weekly YouTube (http://www.youtube.com/) videos were posted by the class instructor to begin engaging students' understanding in basic research concepts. The week before the virtual Second Life field trip, the YouTube video featured a scene of the instructor and librarian's avatars moving inside St. Paul's Cathedral of London in SL (Figure 1) and beside the University of California at Los Angeles (UCLA) library walking towards an image of a large cougar in front of an adjoining building. This approach provided students a visual representation of something new (Second Life) in preparation for their own shared learning journey in the same virtual locations that would be familiar to them the following week. Students were assigned to take in-world photos of their avatar group (accomplished by clicking a camera icon within the SL viewer program) to capture the locations they visited. Photos emailed to the instructor served as a means to hold students accountable as a shared responsibility for their participation in their in-world journey.

In addition to viewing the instructor's YouTube video, students downloaded a document outlining field trip procedures to further engage them in the process. The students' virtual field trip was divided into three parts. The first segment required them to download the SL viewer software onto their computers, register and create their avatars before completing the introductory tutorials on Welcome Island (Figure 2), the in-world location where SL newcomers learn how their avatars can walk, run, fly and teleport from site to site. When finished, each student was instructed to take a photo of their individual avatar and send it to the course instructor. For step two, students assembled their avatars in groups at the UCLA Library where they were instructed to explore the site for ten minutes and discuss their observations in live text chat or, for those with a microphone, live voice chat. They also were assigned to take a group photo in front of an image of a large cougar near the campus site, an event demonstrated in the instructor's weekly YouTube video. After the photo was taken and emailed to the instructor, class members visited two additional assigned locations: the Biomedical Research Laboratory and St. Paul's Cathedral of London. Student groups were to explore these sites for ten minutes each, record their observations and send photos to the instructor when finished. After completing the three trips, group members visited a fourth site of their own choosing, bringing into play the constructivist characteristics of negotiation and shared responsibility, decision making,

Figure 1. The authors' avatars within a replica of St. Paul's Cathedral of London inside the immersive 3-D world of Second Life

Figure 2. First-time avatars at Welcome Island

control and power. Students emailed their fourth and final site photos, signifying the conclusion of their Second Life experience.

Throughout the week of the virtual field trips as students sent photos of their avatars to the course instructor, many expressed a spectrum of lively comments indicating their engagement in the process and achieving a level of learning and critical thinking. Reports ranged from enthusiasm at successfully creating their avatars to laments about the time it took to complete the registration process. The photos created in SL were 2-3 megabytes in size. The instructor converted them to smaller jpeg files (about 100 kilobytes each) and sent them back to the students to upload into their blogs. Although most students experienced some technical difficulties, such as computer freezing, all fifty-eight successfully completed the first phase of the student-centered assignment.

Later in the week, student groups embarked on their SL field trips. As an example of the richness of student negotiation and decision making, the first photos came from a group calling themselves, "Belles Passionates," and featured their avatars at the assigned locations. For their final destination, this group chose to visit "The Temple of Meditation," where their avatars struck mindful poses in a monastery setting (Figure 3). More fourth destination photos soon arrived – some from such diverse SL locations as Magicland and Cheval de Mer. One group teleported to SL's Grand Canyon and sent a snapshot of their avatars rafting down the river together (Figure 4) illustrating an accomplished level of constructivist-based learning. Several groups also sent humorous photos such as avatars flexing their muscles (Figure 5), flying and even dancing. Although the groups appeared to be having fun, some students emailed the instructor expressing frustration that their avatars had gotten "stuck" requiring the constant rebooting of their computers.

Figure 3. Group Members Engage in Relaxation at their Fourth Destination, "The Temple of Meditation," Emphasizing the Richness of Student Negotiation and Decision Making

Results

Results were codified in the final step of the virtual field trip in which students worked in their groups to answer a series of nine research questions (Table 1) about SL and posted responses to their blogs with comments posted by the class instructor on all sixteen blogs. To answer the first two questions, students provided general insights and observations about their virtual field trip and were to include the name of the fourth site they had negotiated to visit. A

Figure 4. Group Members Simulate Experiences in the Real World Such as Rafting Down the Grand Canyon Showcasing Constructivist-Based Learning

Figure 5. Group Members Strike a Humorous Pose by Flexing their Muscles; Perhaps a Sign of Unity for having Completed a Task Both Unique and Challenging

S.No	Research Questions
1)	Write down any comments, impressions, etc., about the four SL sites you visited.
2)	Write the name of the fourth site you visited as it appears in the address window just under the Menu items.
3)	What are at least 2 advantages to spending time in the SL environment.
4)	What are at least 2 disadvantages that are evident in SL
5)	Reliability – How are each of the locations you visited consistent with each other? How are they different from each other? (Give at least one example of each).
6)	Validity – In what way does SL accurately convey a real life experience? In what way is SL not an accurate depiction of real life experience.
7)	On a scale of 1 (totally negative) to 10 (totally positive), how would you rate your group experience of SL? (Please include any feedback here, as well).
8)	Formulate a hypothesis based on your experience in SL. Using boldface type, state your hypothesis in "If . . . Then" format OR as a statement (e.g., "Consistent intervention methods enable improved functioning in children with autism.") Include both the Independent and Dependent Variables of your hypothesis.
9)	Based on your hypothesis, create a survey of 5 questions about Second Life. The survey can be geared toward new users, advanced users, SL programmers, etc., so be sure to include your target audience for the survey. Surveys must include each of the following question types: Demographic question, Yes-No question, Multiple choice question, Likert-type question, and Open-ended question.

Table 1. Nine Research Questions Students Answered After Their SL Experience

total of sixteen groups completed the field trip, five sharing common observations about the absence of other avatars and the similarity of the terrains from site to site. Some groups saw this as an advantage (e.g., "It gave us a chance to fly around and get familiar with the sites without disruption"), while others expressed a desire for more diversity in the locations they visited. For their fourth site, six of the sixteen groups chose to visit the same location, Magicland, many noting how impressed they were at its detailed graphics. On the other hand, some students reported unwanted intrusions by avatars not a part of the class that tried to "hook up with us no matter what we did to discourage them." Some of the other final sites included Miami Vice, MI, where students commented, "Great dance site. You can eat ice cream there!" and the Great Wall of China, "The sun was huge!"

In responding to the third question, students discussed advantages and disadvantages of their SL experience. Positive observations included, "You can be whoever you want to be," "You can meet people from all over the world," and "You can never die in Second Life." Disadvantages focused on the necessity of "dealing with technical difficulties" and the social nature of the program: "It would be easy for people to become socially dependent on others . . . and this could negatively impact their interactions in the real world."

Students then were assigned to discuss the reliability and validity of the sites they visited. Nine groups noted in their blogs the consistent nature of each island as self-contained and propagated with similar structures such as buildings and waterfalls. Several class members discussed the validity of the program in terms of the avatars and some marveled at their ability to dress and shape their avatars to look like people in the real world (Figure 6). Other students were less impressed by avatar appearances, referring to their avatars as templates with little resemblance to humans.

Next, students were asked to rate their group experiences in SL on a scale of one to ten, with ten denoting high satisfaction. Seven of the sixteen groups rated their experience a five and several comments indicated that the scores would have been higher if technical glitches were not so prominent.

Most of the remaining nine groups rated their experience higher, with eight being the top score. "Great experience!" noted one group on their blog page. A few groups provided individual assessments, with one group's responses of two, five, and eight being the most diverse. An enthusiastic group titled their blog post, "Get a (Second) Life, Dude!" and offered positive comments about the trip

Figure 6. One Student's Observation: "You Can Be Whoever You Want To Be." This Meticulously Crafted Student Avatar Demonstrates the Creative Learning Potential for Second Life Users

along with numerous SL photos. One common theme emerged; students found the experience of synchronous group participation more satisfying than actually being in Second Life. A student illustrated this dichotomy by writing, "I would rate the Second Life trip as about a 5, but the joy of being with my fellow group members made it an 8." One could argue that this high satisfaction with group interaction is indicative of the constructivist elements of shared responsibilities and decision making within the immersive environment.

Finally, students were assigned to create research hypotheses as well as survey questions based on their time in SL. Suggested theories from nine groups focused on the perceived negative social aspects of being in Second Life for long periods of time:

- The time spent playing SL per week is inversely proportional to one's satisfaction with real life interpersonal relationships.
- Frequent users, who engage SL as an online community for themselves rather than as an online source for resources, are more likely to experience holistic dissatisfaction with their real lives.

Nevertheless, not all the groups agreed on the potential negative aspects of the environment as evidenced by the following:

- If Second Life was integrated once per week into online course classes, then students' grades would improve.
- If someone is an advanced user in Second Life, then they are more likely to be adventurous in life compared to someone who hasn't experienced Second Life.

Each group created demographic and Likert-based questions for prospective surveys based on their group's hypotheses. For many of these graduate psychology students, the benefits of being in SL were outweighed by the potential emotional damage of choosing a virtual life over a real one.

Subsequent to their Second Life experience, students were asked to submit their feedback about the online course in a SurveyMonkey five-point Likert questionnaire provided by the instructor (Table 2). For the survey item, "Overall, I enjoyed my experience in Second Life," a total of fifty-three percent responded agree or strongly agree (Table 2 and Figure 7). For the survey item, "Being part of a group aided in my learning of research concepts," eighty-one percent of students chose agree or strongly agree. (Table 2 and Figure 8)

When asked to provide general reflections on their online class experience seven students wrote specifically about Second Life. One student offered a positive comment, "I can say that maybe making the Second Life field trip even more a part of the class would be interesting," while the remaining input was more somber in tone, as reflected in the following statement: "I would consider taking out the Second Life field trip. I did not see the benefit for my learning experience from it."

After completion of their SL trips, written assignments and SurveyMonkey questionnaire, students continued to submit discussion posts and photos to their blog pages without receiving a grade. Although technology dampened the spirits of many, some took the experience in stride. One group offered the following hypothesis: "If professors

Variable	%~Agree	M	SD
Student Impressions of Second Life (Scale of 1-5)			
Overall, I enjoyed my experience in Second Life	53	3.34	0.94
Being part of a group aided in my learning of research concepts	81	3.93	1.09

Table 2. Second Life Survey (N=32)

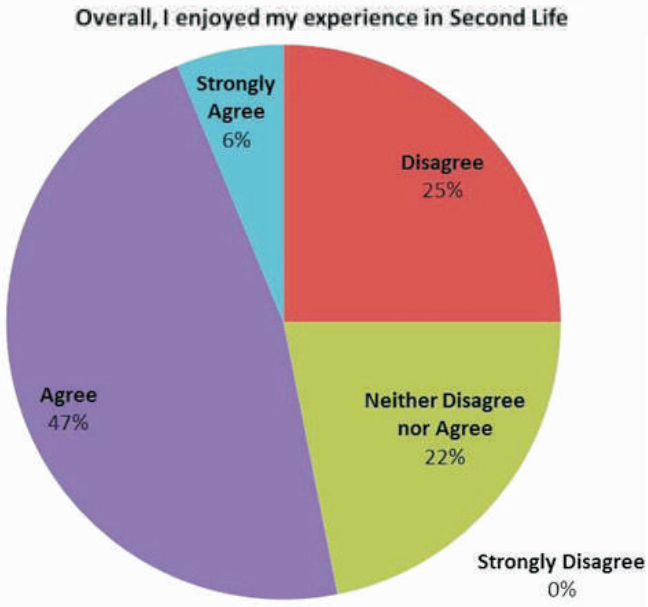

Figure 7. Diagramatic Representation of Second Life Survey

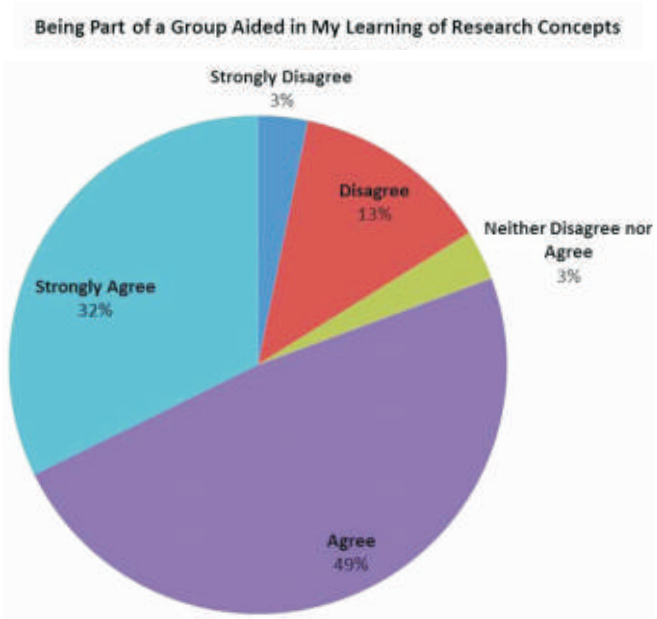

Figure 8. Research Groups

allowed for students to cite SL as a reference, then more time would be spent researching." A humorous theory, for sure, but perhaps one that could bear fruit with more student-based virtual field trips (and hopefully less technical difficulties) in the future of virtual, online, 3-D immersive education.

Conclusion

A group of fifty-eight graduate psychology students in an online course on Research Methods were evaluated on their experience with an assignment requiring constructivist-type group work within the 3-D immersive environment of Second Life. Fifty-three percent of the participants responded strongly agree or agree to the statement "Overall I enjoyed my experience in Second Life." Eighty-one percent of the students responded strongly agree or agree to the statement "Being part of a group aided in my learning of research concepts." Students struggled understanding how to get around in the new environment and some expressed frustration in slow response times or crashing of their computers. All sixteen student groups successfully accomplished all parts of the Second Life field trip experience.

Based on these and other observations from this student-centered research project within Second Life, the authors propose the following fourteen-point constructivist-based model for teaching within 3-D, immersive environments with illustrations from the research:

Student-Centered

- Move away from lecture-type, text and video only instruction and toward group discussion and field trips (live chat or audio discussions and the four field trips)
- Provide student-centered assessment (teacher and student comments on student created blogs)

Process Approach

- Every student contributes to the process and not just an end product controlled by few students (creation of individual avatars and learning how to move around in Second Life, live chat or audio discussions by every student within each of four locations)
- Process includes a balanced emphasis on both individual student as well as group activities (creation of individual avatars and moving within a new environment, groups moving through the four field trips, groups or individuals contributing to the ten research questions)

Involve Negotiation

- Students negotiate with teacher and/or one another on parts of the course (students negotiated on a name for their group as well as the fourth destination in Second Life)
- Negotiation includes choice of assessment (student decide what to report in blogs that are commented by fellow students and teacher, choice of where and how to take the photos sent to teacher to verify field trips)

Teacher as Facilitator/Researcher

- The teacher engages with students as a shared learner/researcher (affirming student blog postings, instructor shares own research from class experiences) and facilitator of learning vs. an expert dispenser of information (general lecture of text and/or video)
- Provides mutual respect between teacher and students by blending teacher modeling (YouTube postings inside Second Life on what to expect) with constructive teacher feedback the entire class views (instructor's comments on student blogs)

Interactive

- Students interact with one another in real time (forming groups of three to four which meet and interact in-world in real time together)
- Include interdependence between teacher and student (students send Second Life images for accountability and teacher sends back reduced size images for students to post to blogs)

Shared Responsibilities in decision making/power/control

- Students have high level of active choices (students' choice of their group name and fourth destination in Second Life, answering the ten research questions as a group or as individuals)
- Student has responsibility for learning (shared views in chat/audio during four field trips, postings to blogs, sending photos to teacher)

Other Considerations

- Computers with adequate working specifications (e.g., video card, RAM memory)
- An introductory workshop which provides instruction on basic Second Life tasks

It is hoped that these suggestions will further the capacity of teaching within immersive environments like Second Life and spur on the conversation for higher quality of student engagement and learning in all forms of online learning environments.

References

[1]. De Lucia, A., Francese, R., Passero, I., & Tortora, G. (2009). Development and evaluation of a virtual campus on Second Life: The case of SecondDMI. *Computers & Education,* 52(1), 220–233.

[2]. Delwiche, A. (2006). Massively multiplayer online games (MMOs) in the new media classroom. *Journal of Educational Technology Society,* 9(3), 160-172.

[3]. Gao, F., Noh, J., & Koehler, M. (2008). Comparing student interactions in Second Life and face-to-face role-playing activities. *Proceedings of Society for Information Technology and Teacher Education International Conference 2008,* 2033-2035.

[4]. Good, J., Howland, K., & Thackray, L. (2008). Problem-based learning spanning real and virtual words: A case study in Second Life. ALT-J, *Research in Learning Technology,* 16(3), 163–172.

[5]. Gray, A. (1997). *Constructivist teaching and learning (SSTA Research Centre Report No. 97-07).* Retrieved from http://saskschoolboards.ca/research/instruction/97-07.htm

[6]. Hobbs, M., Gordon, M., & Brown, E. (2006). A virtual world environment for group work.

[7]. Jarmon, L., Traphagan, T., & Mayrath, M. (2008). Understanding project-based learning in Second Life with a pedagogy, training, and assessment trio. *Educational Media International,* 45(3), 157-176. doi:10.1080/09523980802283889

[8]. Joosten, T., & Stoerger, S. (2011). Curricular redesign grant proposal 2011-2012: Expanding the potential of virtual worlds: *Exploring the impact of intensive faculty development ion teaching and learning.*

[9]. Lansiquot, R. (2009). Advanced technical writing: Blending virtual communities. *Journal of the Research Center for Educational Technology,* 5(1), 57–63.

ABOUT THE AUTHORS

Dr. Scott Bledsoe is an Assistant Professor in the Department of Graduate Psychology at Azusa Pacific University (APU), where he teaches online research methodology and other courses to students of Marriage and Family Therapy. He maintains a private psychotherapy practice and is an active member of both the Azusa Human Relations Commission and the Mayor's Homeless Voucher Task Force Committee. Before embarking on a career in clinical psychology, he worked as an elementary school teacher and technology coordinator at 49th Street Elementary School in South Central Los Angeles, California.

Dave Harmeyer is working as a Professor and Associate Dean of University libraries at Azusa Pacific University, where he teaches an online Library Media Technologies course in the Teacher Librarian program and is a member of the University Libraries' leadership team. He recently completed is doctorate at Pepperdine University (Ed.D., Educational Technology, 2007) with the dissertation Online Virtual Chat Library Reference Service: A Quantitative and Qualitative Analysis. Currently he is a column editor for The Reference Librarian and is on the board for the Journal of Religious & Theological Information. Prior to joining APU in 1997, he was the Library Director at the International School of Theology in San Bernardino, California.