

How the Use of Second Life Affects E-Learners' Perceptions of Social Interaction in Online Courses

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ABSTRACT

Educators, researchers, and online courses designers are increasingly investigating the use of 3-D shared virtual worlds for online education. This paper discusses the importance of social interaction in e-learning. We present the idea of using Second Life, a 3-D shared virtual world, in online courses. The researchers investigated the impact of using Second Life as a learning environment and a communication medium in online courses. We measured the extent to which the completion of a learning task and the communication in Second Life can enhance the e-learners' perceptions of social interaction via a self-report questionnaire. A prototype application called *The Village of Belknap* was developed by the Delphi Center of Teaching and Learning at the University of Louisville. The study compared the perception of social interaction of e-learners who participated in Second Life sessions with the perception of social interaction of e-learners who did not participate in the Second Life sessions. The results indicated that the use of Second Life has a positive impact on experiencing a high perception of social interaction in online courses.

1. INTRODUCTION

The rapid development of world-wide communication technology tools has brought people closer together and made the world seem smaller. A high percentage of people in the world spend a significant amount of time using email, real-time chat rooms, instant messaging, and virtual environments to interact with one another. According to [4, 14], millions of users spend on average 22 hours a week interacting with each other through

avatars. At the same time, e-learning is a rapidly growing field.

This growth leads designers and educators of online courses to search for and employ the latest communication medium in their courses. One main goal of designers and educators using online courses is the implementation of a communication media that can lend support in applying the collaborative learning theory to their courses and encourage active interaction among e-learners.

2. COLLABORATIVE LEARNING THEORY

Collaborative learning theory's fundamental premise is that learners must collaborate meaningfully in learning activities through interaction with others. The collaborative learning activities provide e-learners the opportunity to explore course materials virtually with their colleagues.

3. WHAT IS SOCIAL INTERACTION?

According to the sociology discipline, social interaction is the action of two or more persons that can be observed to be mutually interdependent [7]. There are two main conditions for the success of social interaction among learners. The first condition is the physical proximity of learners-their existence in the same space. The second condition is the ability to use non-verbal communication cues during the interaction process. According to [3, 11], nonverbal communication cues serve two main functions: 1) conversation management; and 2) the communication of emotion.

The Role of Social Interaction

Social interaction is one of the most critical elements of successful e-learning. It is helpful for e-learners to get feedback from their instructors as well as their colleagues regarding their ideas and performance in course-related activities and to encourage e-learners to engage in active learning. According to [9], there are four main types of social interaction in e-learning (Figure 1). Each type of interaction has a significant effect on the e-learners' performance in online courses. The quantity and quality of teacher interactions with online learners is linked to student learning [8].

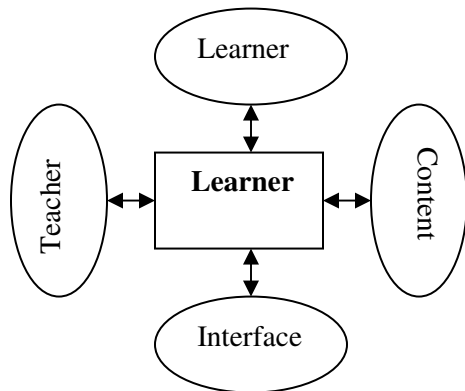


Figure 1. Types of Social Interaction

According to [10], verbal immediacy behaviors can lessen the psychological distance between communicators online. In addition, the interactions with course interfaces are an important factor in learning, and difficult or negative interactions with interfaces can depress learning [5,6]. A positive relationship was found between e-learner content interaction and e-learner achievement in online courses [5]. The researchers [2] stated that “when learners perceive the level of interaction to be high, they will be more satisfied with instruction than when they perceive the level of interaction to be low” (p. 8).

Today's currently employed communication media in e-learning cannot satisfy the above two conditions and cannot support educators and designers in achieving the above goals. Therefore, shared virtual environments emerged as a communication tool that can overcome the limitations of the currently employed communication media.

4. 3-D SHARED VIRTUAL WORLDS

Shared virtual worlds emerged as a new communication medium. 3-D shared virtual worlds can be defined as a computer generated multi-user three-dimensional interface in which e-learners can also experience other participants as being present in the environment [12]. In such environments, e-learners are situated in the same time as well as the same virtual space. In addition, e-learners interact with each other and express their non-verbal behaviors through the use of personal avatars. An

avatar can be defined as “any graphical representation of a human in a multi-user computer generated environment” [12]. (See figure 2). We assert that virtual worlds are a communication medium that can facilitate the practicing of virtual face-to-face interaction that implies facial expressions, postures, and gestures.



Figure 2. Avatars in a shared virtual world

4.1 Second Life

Second Life is the internet-based 3-D shared virtual world where we conducted our study. Linden Labs, the creator of Second Life, defines it as a “3-D online persistent space totally created and evolved by its users” [13]. In Second Life, users navigate, interact, and view the world through their personal avatars. Users interact with objects via a graphical user interface that is largely mouse-driven. The main features of Second Life are as follows;

- **Identity selection:** Countless avatar customizations allow e-learners to change their avatar's appearance to look any way they choose.
- **Communication options:** E-learners can communicate in a variety of ways including typed chat, private instant messaging, and voice chat. In addition, they can convey their non-verbal expressions via the pre-programmed animations such as laughing, crying, dancing and others.
- **A realistic environment:** Dynamic lighting and shadowing, a complete weather system, and up-loadable textures and audio all add to e-learners real world experience.

To date there have been few attempts to investigate the impact of using Second Life to study e-learners' perceptions of social interaction in online courses. This paper reports the results of a pilot study using Second Life in online courses. This work is intended to expand the evidence that 3-D virtual worlds can: 1) strengthen e-learners' perceptions that they are together in the same place while in reality they are in separate physical Locations, 2) create the experience of face-to-face interaction, and 3) enhance learners' perception of social interaction.

5. METHODOLOGY

5.1 Participants

This is a pilot study. Ten participants from the University of Louisville participated in the experiment. The e-learners were enrolled in English 301, British Literature. They were of mixed age, gender and educational backgrounds. More than half of the participants (6 or 60%) were female and (4 or 40%) were male ranging in age from 18 to 20 years.

5.2 Experimental Design

This experiment was conducted to investigate the impact of using Second Life as a learning environment and a communication media on the e-learners' perceptions of social interaction. Due to the small sample size, the Mann-Whitney non-parametric test was employed to determine whether the average difference between the two groups was statistically significant. The type of participation in the online course activities was manipulated to determine how it affected the perceived quality of interaction that participants experienced during the experiment. Two different types of participation were conducted. One type of participation included e-learners who participated in the online course activities as well as Second Life activities, and the other type of participation included e-learners who participated only in the online course activities.

5.3 Instrument

The Relational Communication Questionnaire (RCQ) developed by [1] was utilized. The questionnaire was used to collect quantitative data regarding learners' perception of the quality of social interaction. The RCQ addresses the immediacy/affection, similarity/depth, receptivity/trust, composure, formality, dominance, and equality. The RCQ questionnaire consists of 19 items with a five-point Likert scale with response options ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire yields a total score that ranges from 19 to 95 with a higher score indicating a better perception of the quality of social interaction. The overall internal consistency reliability of the questionnaire is $=.70$. Alpha ranged from a low of $.52$ equality factor to a high of $.81$ for the immediacy/ affection factor.

5.4 Description of the Learning Environment

The Second Life experience was specifically tailored to help e-learners understand the course material. A medieval village called *The Village of Belknap* was created (Figure 3 and 4). This enabled e-learners to better experience life in the 16th century. For e-learners who participated in the Second Life sessions, tasks were designed to help them gain a better understanding of issues in sixteenth-century England such as romantic love, individualism, and family obligation.



Figure 3. A Snap shot of The Village of Belknap



Figure 4. A Snap shot of The Village of Belknap

Before starting the task, the e-learners were asked to:

- Choose a village identity for their avatar from the following list: 3 courtiers; 3 ladies; 2 wool merchants; two weavers; monk.
- Choose appropriate sixteenth-century clothing for their avatar.
- Update their Second Life profile to reflect their new sixteenth-century role.

During the activity e-learners:

- Click on other avatars and read their sixteenth-century profiles; interact with the other characters in a way that is appropriate to the social role of their character in sixteenth-century English culture, 10 minutes;
- Learn about sixteenth-century culture by clicking on scroll symbols placed around the village; at each scroll a note card explains the village and its sixteenth-century culture, 10 minutes;
- Create a note card to post on the bulletin board, describing one sixteenth-century belief about romantic love and cite a literary work that makes that claim, 15 minutes;
- Read what others have posted, 10 minutes;
- Come to the tavern and sit down at a table. Open the *Chat* function and click *History* to have a record of what's been said. A noble woman in the group is tempted to defy her family and elope with the man she loves. Everyone is expected to contribute to the debate using arguments that reflect the various sixteenth-century attitudes toward romantic love, individualism, family obligation, Christian Humanism, and de contemptu mundi ethics. Make an argument that their character would have likely made, 25 minutes;

- When the noblewoman made her decision, learn her fate by coming down to the bulletin board area and reading the outcome of her decision on a note card, 5 minutes.

5.5 Procedures

One week before sending the questionnaire, the instructor sent an email to e-learners to motivate them to participate in the questionnaire. She explained to them the purpose of the survey. She also informed them that extra credit points would be awarded as an incentive. E-learners were sent a hyperlink to an online survey via email deployed using Zoomerang, an online survey tool. Participation in the survey was completely voluntary and there were no negative ramifications for e-learners who chose not to participate. An announcement was also posted in Blackboard. The survey was completely anonymous, so e-learners who participated in the survey were asked to inform the instructor of their participation via e-mail to receive the extra credit points. E-learners were given a week to complete the survey.

6. RESULTS

The researchers hypothesized that participation in Second Life activities and the facilitation of more avenues of communication and interaction among e-learners would lead to a higher perception of social interaction. Based on the results of previous social interaction studies, we expected greater perception of social interaction to occur with the use of a communication medium which allows e-learners to experience a type of interaction that is close to everyday face-to-face interaction.

The descriptive data showed that the participants' ratings of the RCQ ranged from 55 to 78 among all participants, from 55 to 68 in the online only condition, and from 68 to 78 in the online Second Life condition. Figure 5 shows the relationship between the median value (MV) of the e-learners' responses to the social interaction questionnaire and the type of participation.

Treatment	N	Median	Min	Max
Online Only	6	67.5	55	68
Online SL	4	77.50	68	78

Table 1. Descriptive Results of the RCQ

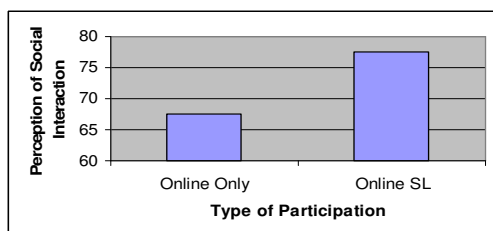


Figure 5. Median values of e-learners' responses

Figure 5 demonstrates that e-learners' perception of the quality of interaction was better in the condition of online SL (MV =77.5) compared to the online only condition (MV = 67.5). The results revealed that e-learners participation in the Second Life sessions affected e-learners' perceptions of the quality of social interaction.

Although the results indicated that the e-learners who participated in the Second Life sessions experienced a higher perception of social interaction than e-learners who did not participate in Second Life sessions, they did not indicate whether the differences between the two groups were statistically significant or not. Therefore, the *Mann-Whitney* test was used to examine the significance of the difference between the two groups. An alpha level of .05 was used for the statistical test.

Test Statistics^b

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Mann-Whitney U	2.000
Wilcoxon W	23.000
Z	-2.165
Asymp. Sig. (2-tailed)	.030
Exact Sig. [2*(1-tailed Sig.)]	.038 ^a

a. Not corrected for ties.

b. Grouping Variable: typeofclass

Table 2. Mann Whitney Test Results

According to table 2, the results show that the $Z = -2.165$, $p = .038$. The results are statistically significant at a significance level of 0.05. Together with the descriptive data in table 1, the results indicated that the participants in the online Second Life sessions experienced a significantly better perception of social interaction than those in the online only condition. The findings show that the participation in the Second Life activities made the e-learners feel more engaged and more involved in the discussion process. These results support [14] argument that the use of the 3-D shared virtual worlds supports the feeling of togetherness.

7. DISCUSSION

This study extends the research on the effect of employing 3-D shared virtual worlds in e-learning. The researchers focused on manipulating the type of participation among e-learners to explore whether the use of Second Life as a learning environment and a communication medium can affect e-learners' perceptions of social interaction. The findings indicate that the interactive interface of Second Life encourages e-learners to share experiences and visions and motivates them to interact with each other to complete the learning task. In addition, the existence of avatars in 3-D shared virtual worlds is considered one of the unique features of such environments.

The existence of avatars allows e-learners to play different roles, select their own costumes, and use body language during interaction with colleagues in Second Life. Also, the existence of the avatar in the 3-D shared virtual worlds as e-learners' embodiment affected e-learners' interaction with each other. E-learners' ability to move the avatars' bodies, hands, or legs to express non-verbal behaviors increased their enjoyment and their rate of interaction with others. The use of the avatar gave e-learners the feeling and the experience of real life face-to-face interaction.

The use of Second Life provides e-learners with the visual experience of meeting their online classmates. Moreover, the existence of e-learners in a 3-D shared virtual world that represents a medieval village provides them with a visual memory representation of this period in time. In turn, it makes it easier for the brain to interpret and store the images presented for British literature.

Our findings suggest that: 1) the use of a learning environment and a communication medium that allow e-learners to see each other as well as express their non-verbal behaviors is an important factor in enhancing e-learners' perceptions of the quality of interaction; and 2) the designers and educators of online courses should focus on employing a Communication medium that urges e-learners to utilize more realistic face-to-face interaction with their colleagues.

There are some limitations in this study. First, in this study we utilized only one type of learning activity, role playing tasks. It is possible that e-learners' perceptions of social interaction differentiate from one type of learning activity to another. Second, we only examined one virtual world out of the many that currently exist. It is possible that e-learners perception of social interaction will be different from one environment to the other. Third, we had a small sample size. Therefore, a replication of this experiment is encouraged.

Future studies may investigate several other issues. First, because we used the virtual world Second Life, just one of many virtual environments that are currently available, we cannot generalize our results to other virtual worlds. Studies in the future might examine social interaction in other virtual worlds. Second, we used Second Life to complete role playing learning tasks, only one of hundreds of available learning tasks. In the future we will use Second Life to a design and develop other types of learning tasks.

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