

Does the Use of Second Life Affect Students' Feeling of Social Presence in E-Learning?

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ABSTRACT

Due to readily available and affordable personal computers, coupled with surging Internet use, e-learning has become popular among undergraduate and graduate students. Social presence is an emerging concept in e-learning. Although the feeling of social presence is an essential factor in e-learning, achieving it can be difficult. The absence of face-to-face communication and the perception of psychological distance can lead to a poor learning experience. This article discusses the importance of social presence in e-learning. The debut of 3-D collaborative virtual learning environments has introduced a new type of communication medium and learning environment to e-learning.

This study examined the impact of using Second Life as a communication medium and a learning environment on e-learners' feelings of social presence. A prototype application called *The Village of Belknap* was developed in Second Life. The researchers compared the perceived level of social presence of e-learners who participated in Second Life sessions and those who did not participate. This study found that e-learners who participated in the Second Life sessions scored higher in their feelings of social presence.

Keywords CVE, Collaborative Learning, Second Life, Avatar, Social Presence

1. INTRODUCTION

There is a significant movement toward distance education. The recent statistics showed that more than 80% of public institutions in the United States offer either online or blended courses [1]. The wide spread of e-learning makes it important to find innovative teaching methodologies instead of just converting the face-to-face course to an

online version of the course. Due to the abstract nature of the British Literature course content, the researchers in this paper explored non-traditional teaching tools to present the learning materials of the course. The literature educators [13], stated that students would better understand the topics of the literature courses if they have a thorough understanding of the community and its environment. One of the currently emerging tools that can be used to teach complex abstract learning concepts is 3D- virtual worlds. These worlds are computer-based simulated environments intended for their users to inhabit and interact via avatars [4]. Such worlds enable learners to learn and experience situations which would otherwise be impossible and/or undesirable for availability, distance, cost, time, logistical or safety reasons [6].

One of the main factors that can support the success of learning in the 3D-virtual worlds is Social Presence. According to [2], social presence is the awareness of the existence of others that is accompanied by a sense of engagement with them. Social presence is a critical factor that affects the quality of social interaction among online learners and, in turn, influences the opportunities for collaborative learning. The research studies that examined social presence in traditional face-to-face courses and online courses through computer mediated communication tools such as teleconference, video conference, and discussion boards proved that social presence can increase student satisfaction and perceived learning outcomes [11 & 15]. On the other hand, there are few studies that examined the impact of 3D-virtual worlds such as Second Life on the feeling of social presence among students. The presented study, therefore, examined students' feelings of social presence through the use of mixed research methods (quantitative and qualitative) of one undergraduate-level online course. Specifically, this study sought to answer the following research question:

- Is there a significant effect of using Second Life on the feeling of social presence for online students?

2. CONCEPTUAL FRAMEWORK

Collaborative Learning

In collaborative learning, learners work together with other learners and with the instructor on a problem situation in order to construct collaborative learning communities. In [14], authors described a learning community as one "whose culture is characterized by commitment and professionalism". Building a community of learners is vital in that it can affect learners' satisfaction and performance. Learning communities are based on the collaborative learning theory whose fundamental premise states that learners must collaborate meaningfully in learning activities by interacting with others. Collaborative learning gives learners the opportunity to converse with peers, present and defend ideas, exchange diverse beliefs, question conceptual frameworks, and become actively engaged [17].

Scope of Social Presence

According to [8], the formation of a learning community requires a feeling of social presence among e-learners. The ability to work effectively in small groups is at the heart of social presence theory and of interest to those involved in creating communities of learners [7, 16, & 18]. When social presence is achieved, learners will wish to participate actively in community activities [2]. Social presence occurs when people are perceived as real beings despite the lack of face-to-face communication [7, 16, & 18]. In [2], authors explained that social presence occurs when users feel that a form, behavior, or sensory experience indicating the presence of another intelligence. To the degree users feel access to the intelligence, intentions, and sensory impressions of another, social presence is achieved.

The main factors that contribute to a high feeling of social presence and the building of successful learning communities are facial expression, direction of gaze, posture, dress, non-verbal, and vocal cues. In [5], authors argued that nonverbal communication cues serve two main functions: conversation management, and the communication of emotion. Today's communication media in e-learning such as MySpace, Facebook, discussion boards, online chats, blogs, wikis, and videoconferencing do not allow e-learners to express non-verbal cues. Technological advances make it possible for e-learners to express non-verbal behaviors in a socially rich distributed environment through 3-D collaborative virtual learning environments. According to [12, p. 403], "The explosion of information technologies has brought learners together by erasing the boundaries of time and place for distance learners". Therefore, 3-D collaborative virtual learning

environments have emerged as a tool that can overcome current communication limitations.

Second Life

Second Life is an internet-based 3-D collaborative virtual environment where the researchers conducted the following experiment. In Second Life, users navigate, interact, and view the world through their personal avatars. Users can communicate in a variety of ways including typed chat, private instant messaging, voice chat, as well as conveying their non-verbal expressions via the pre-programmed animations such as laughing, crying, dancing.

3. METHODOLOGY

Statement of the purpose

The purpose of this study was to determine how the integration of Second Life as a 3-D virtual world can influence e-learners' feelings of social presence. Although social presence has been characterized as an important factor in distance learning [12], there is no real attempt to investigate how the use of 3-D virtual world can influence the feeling of social presence. Therefore, this study examined e-learners' perceived value of social presence. The class that participated in this experiment was an online class that meets 100% online during the entire semester. At the beginning of the semester, the instructor presented to 25 students enrolled in the online version of the course the idea of participating in online practice sessions and the idea behind using Second Life as a learning environment.

The Second Life sessions were developed in an island called The Ville. An optional online orientation meeting was scheduled at The Ville in order to help students to learn how to navigate in the island and create their avatars. After the orientation, four students decided to participate in Second Life sessions in addition to online class activities (SL&OL) and twenty-one students decided not to participate in the Second Life sessions and only be involved in the online class activities (OL). Out of those twenty-one students six students volunteered to participate in the social presence survey at the end of the experiment. The two groups (SL&OL) and (OL) of students were expected to learn the same content.

For the (SL&OL) group of students, instructors arranged for three meetings to take place in Second Life to discuss three different topics. The researchers predicted that the students who participated in the Second Life sessions would experience a better feeling of social presence compared to students who did not participate in the sessions.

Participants

In this pilot study, ten e-learners (four: SL&OL and six: OL) are involved from the University of Louisville in the experimental study analysis. The e-learners were enrolled

in the online English 301, British Literature course. Students 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. They ranged in age from 18 to 23 years.

Experimental Design

This paper used both quantitative and qualitative data to provide a holistic understanding of the importance of 3D-virtual worlds on promoting students' feelings of social presence. The study collected the quantitative data through a survey [3]. The type of participation in the online course activities was manipulated to determine how it affected the feeling of social presence that participants experienced during the experiment. Students' participation in the online course activities was manipulated to determine how it affected the feeling of social presence that participants experienced during the experiment.

In addition to the quantitative methods, interview strategy was employed in order to get a better understanding of how the integration of 3D- virtual worlds may: (1) help students to perform better through the group activities, (2) support students' interaction with their colleagues; and (3) improve their awareness with each others' actions. The researchers used hand-written notes to record students' responses. Randomly selected students were informally interviewed after the third meeting. The qualitative data was analyzed using naturalistic techniques in order to examine students' responses [9].

Instrument

The Social Presence Questionnaire (SPQ) developed by [19] was used to collect quantitative data regarding e-learners' feelings of social presence. The social presence questionnaire consists of three factors:

- Factor 1: Perception of the assistance of group activity to learning
 - This factor is used to measure the extent to which group activities helped students to learn more efficiently than working alone;
- Factor 2: Social comfort of expressing and sensing affect
 - This factor is used to measure the extent to which students are comfortable in expressing their feelings; and
- Factor 3: Social navigation
 - This factor is used to measure the extent to which students are aware of each others' actions.

Each factor consists of a group of questions with a total number of 19 questions. Researchers decided to use 12 related questions in our experiment. The questions use a five-point Likert scale with response options ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire yields a total score ranging from 12 to 60,

with a higher score indicating a higher feeling of social presence. The overall internal consistency reliability of the questionnaire is =0.85. Alpha ranged from a low of 0.7031 for the social navigation factor to a high of 0.9218 for the social comfort of expressing and sensing affect factor.

Also, in order to collect qualitative data about the impact of integrating Second Life as a teaching tool an open-ended interview questions were employed. The interview was constructed to specifically elicit e-learners' responses that would provide the research team with a better understanding of students' perceptions of Second Life. The interview was semi-structured and focused on better understanding of e-learners' overall impression of Second Life, the impact of Second Life on increasing their awareness of other e-learners and facilitating better social interaction with their colleagues, and if the group activities in Second Life helped them to get a better understanding of the British Literature topics.

Description of the Learning Environment

A medieval village called The Village of Belknap was created in Second Life (Figure 1). For e-learners who participated in the Second Life sessions, tasks were designed to help them gaining a better understanding of issues in the 16th century in England such as romantic love, individualism, and family obligation. Students participated in three sessions of Second Life. Each session was linked to a certain learning topic. For instance, we include the description of the third scenario as an example.



Fig 1. The Village of Belknap

Before starting the learning activity, e-learners were asked to:

- Choose a village identity for their avatar from the following list: 3 courtiers; 3 ladies; 2 wool merchants; 2 weavers; 1 monk,
- Choose appropriate 16th century clothing for their avatar, and
- Update their Second Life profile to reflect their new 16th century identity.
- During the learning activity, e-learners were asked to:
 - Read the 16th century profiles of other avatars and communicate in a way consistent with the

- social role of their character in 16th century English culture,
- Learn about 16th century culture by clicking on scroll symbols placed around the village; at each scroll a note card explains the village and its 16th century culture,
 - Create a note card to post on the bulletin board describing one 16th century belief about romantic love and cite a literary work that makes that claim,
 - Read what others had posted,
 - Debate a 16th century scenario where a noblewoman in the group is tempted to defy her family and elope with the man she loves.
- Everyone was expected to contribute to the debate using arguments that reflect the various 16th century attitudes toward romantic love, individualism, family obligation, Christian Humanism, and de contemptu mundi ethics from their character's point of view.

Once the decision was made, students learned their fate by gathering at the bulletin board to read the outcome of her decision on a note card.

Procedures

After completing the third Second Life session and one week before sending the questionnaire, the instructor sent an e-mail to e-learners to explain the purpose of the survey and motivate them to participate in the questionnaire. The survey was administered 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 concerning the survey was also posted in Blackboard. E-learners were given one week to complete the survey.

4. DATA ANALYSIS

The quantitative data was analyzed using SPSS. The data was entered into SPSS and analyzed using Mann-Whitney non-parametric technique to determine whether the difference between the two groups was statistically significant or not. Regarding the qualitative data, the researchers generated categories, identify themes, and look for recurring patterns among the responses to the questions. The analysis of the quantitative and qualitative data allowed us to look across the data to understand e-learners' thinking about both a large and fine grain level.

Findings and Discussion

The researchers hypothesized that participation in the Second Life activities and the facilitation of more avenues of communication and interaction among e-learners would lead to a higher feeling of social presence. Based on the results of previous social presence studies, we expected that the use of Second Life would allow e-learners to experience a higher feeling of social presence during their interaction with peers.

Treatment	N	Median	Min	Max
Online Participation Only	6	40.5	37	48
Online and SL Participation	4	53	44	60

Table 1: statistical significance results at the 0.05 level.

The descriptive data (Table 1) indicates that the participants' ratings of the SPQ ranged from 37 to 60 among all participants; 37 to 48 in the online only condition, and from 44 to 60 in the online/Second Life (SL) condition. E-learners' feelings of social presence was better in the condition of online/SL (Median Value =53) compared to the online only condition (Median Value = 40.5).

The results show that e-learners' participation in the Second Life sessions affected their feelings of social presence. Although the results indicated that e-learners who participated in the Second Life sessions experienced a higher feeling of social presence than e-learners who did not participate, they did not indicate whether the differences between the two groups were statistically significant. 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.

The results show that $Z = -2.057$, and $p = .040$ (Table 2), demonstrating statistical significance at the 0.05 level. Together with the descriptive data in (Table 1), the results indicate that participants in the online/ Second Life sessions experienced a significantly higher feeling of social presence than those in the online only condition. Students with high overall social presence scores also indicate more satisfaction during interaction with team members. This implies that students' perceptions of social presence are related to the amount of interaction and/or quality of that interaction with their peers.

Social Presence	
Mann Whitney U	2.5
Wilcoxon W	23.5
Z	-2.057
Asymp. Sig. (2-Tailed)	0.040
Exact Sig. [2*(1-Tailed)]	0.038 ³

Table 2: Mann Whitney Statistical Tests Results

Researchers examined deeply students' interviews and their comments. We discovered that student comments revealed that they enjoyed the interactive nature of Second Life, enjoyed the role-playing nature of the game, and enjoyed the group activities. Students valued Second Life as a new teaching tool in order to learn difficult abstract concepts of the British Literature. We include quotes from students' comments that are organized as follows:

Regarding students' perception of Second Life as a tool that facilitates group activities and learning:

- "It was more interactive"

- “I really enjoyed it. The role playing was quite fun”
- “I think I learned more through the role playing activity than by reading a book. I personally don’t like to read that much”
- “Yeah, the village helped me very much to get a better sense of the time period”
- “Well Second Life made it more interesting and fun. I really looked forward to every meeting”
- “Fun because it was personal”

Regarding students’ abilities to express their feelings, most of the students indicated that the use of Second Life and the existence of the avatar provided them with the change to be able to express their feelings as follows:

- “SL made the class more interactive. I could get into the role and act it out without getting in front of others. In a F2F class it is harder to act it out. I am rather shy, but was less inhibited in SL. To be able to contribute, I had to make sure I was read up and prepared to make a good argument for the role play activity. The environment (the medieval village) helped facilitate getting into your part”
- “It was very nice to exchange the ideas”

Finally, students expressed that Second Life provided them with a high sense of connection that can increase students’ awareness as follows:

- “Second Life created a sense of interaction. It was a good experience and made me feel like I was not in an online course. It provided me a sense of connection”.

Responses to the questionnaire as well as students’ comments indicate that e-learners perceive social presence as one of the main requirements for exchanging ideas, giving feedback in a personal and warm context, building trust and interpersonal relationships among the team members, and building a personal atmosphere learning environment. In addition, the results indicate that e-learners believe feeling the existence of another person helped them

to accomplish the Second Life activities better and more efficiently than if they were working alone.

The unique existence of avatars in 3-D collaborative virtual environments provided e-learners with the ability to express their feelings to their peers. Avatars allowed e-learners to play various roles, select their own costumes, use body language during interaction with colleagues, express humor, and appreciate the humor of their peers in Second Life. Moreover, the use of avatars affected e-learners’ interaction with each other. The ability of e-learners to move the avatars’ body, hands, or legs to express non-verbal behaviors increased their enjoyment and rate of interaction with others. Using avatars gave e-learners the feeling and the experience of real life face-to-face interaction.

5. CONCLUSION

It is clear from the results of this study that social presence is a vital element affecting students’ enjoyment and interaction during learning activities. This study extends the research on the effect of employing 3-D collaborative learning virtual environments in e-learning. The results show 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 tasks.

The results of this research can be an effective source of information for both researchers and practitioners. Since social presence is a new concept in the area of collaborative virtual environments, more research is needed in both online and face-to-face learning. Studies are needed to examine the impact social presence has on students’ learning performance, perception of social interaction, satisfaction and enjoyment, and motivation. In addition, research is needed to investigate how students’ personal characteristics can influence their feelings of social presence.

6. REFERENCES

- [1] Allen, I. & Seaman, J. (2003) *Sizing the Opportunity: The Quality and Extent of Online Education in the United States*. Wellesley, MA: The Sloan Consortium
- [2] Biocca, F; Burgoon, J; Harms, C; & Gregg, J. (2001). The Networked Minds Measure of Social Presence: Pilot Test of the Factor Structure and Concurrent Validity. *Journal of Computer-Mediated Communication*, 8(7)210-221
- [3] Gall, M., Borg, W., & Gall, J. (1996). *Educational research: An introduction*. White Plains, NY: Longman
- [4] Garau, M. (2003). The Impact of Avatar Fidelity of Social Interaction in Virtual Environments. PhD Dissertation. University of London, London, UK
- [5] Garau, M., Slater, M., & Steed, A. (2003). The impact of avatar realism and eye gaze control on perceived quality of communication in a shared immersive virtual environment. *Proceedings of the SIG-CHI Conference on Human Factors in Computing Systems*. April 5-10, 2003, Fort Lauderdale, FL.
- [6] Gerhard, M. (2003) *A Hybrid Avatar/Agent Model for Educational Collaborative Virtual Environments*, PhD Thesis, Leeds Metropolitan University, Leeds, UK
- [7] Garrison, R., Anderson, T., & Archer W. (2001). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education*, 2(2-3), 87-105.
- [8] Garrison, R., Anderson, T., & Archer W. (2003). A Theory of Critical Inquiry in Online Distance Education. In Moore, M & Anderson, W (Eds.), *Handbook of Distance Education* (pp. 113-127). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- [9] Guba, E. & Lincoln, Y. (1983). "Epistemological and methodological bases of naturalistic Inquiry". In Madaus, G. F.; Scriven, M.; and Stufflebeam, D. L. (eds.) *Evaluation Models: Viewpoints on Educational and Human Services Evaluation*. Norwell, Massachusetts: Kluwer. pp. 311-334
- [10] Gunawardena, C. (1995). "Social presence theory and implications for interaction and collaborative learning in computer conferences." *International Journal of Educational Telecommunications*, 1(2/3), 147-166.
- [11] Gunawardena, C. & Zittle, F. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education*, 11(3) 8-26
- [12] McIsaac, M. & Gunawardena, C. (2001). Distance Education. In David H. Jonassen, (Ed), *Handbook of Research for Educational Communications and Technology*. p. 403-437.
- [13] Prawat, R & Floden, R (1994). Philosophical perspectives on constructivist views of learning. *Educational Psychology*, 29, 37-48
- [14] Retallick, J., Coombe, K., & Cocklin, B. (1996) Beyond the Horizon: Towards Learning Communities in Education. In Lucardie, D. (Ed.), *Beyond the Horizon: Continuing Professional Education*, UNE, Armidale, pp.17-28.
- [15] Richardson, J. & Swan, K (2003). Examining Social Presence in Online Courses in Relation to Students' Perceived Learning and Satisfaction. *Journal of Asynchronous Learning Networks* 7(1)68-88
- [16] Short, J., Williams, E., & Christie, B. (1976). *The Social Psychology of Tele-Communications*, John Wiley & Sons Ltd, London, UK
- [17] Swan, K. (2002). "Building learning communities in online courses: The importance of interaction." *Education, Communication and Information*, 2(1), 23-49.
- [18] Tu., C, & McIsaac, M. (2002). The relationship of social presence and interaction in online classes. *The American Journal of Distance Education*, 16(3), 131-150.
- [19] Yin Lin, G. (2006). *Social Presence Questionnaire of Online Collaborative Learning: Development and Validity*. Chicago, IL: Association for Educational Communications and Technology. (ERIC Document Reproduction Service No. ED. ED484999).