

Community matters: Social presence and learning outcomes

Carol Hostetter¹

Abstract: The study examines the relationship between social presence and students' learning outcomes. An emerging body of research connects social presence with learning outcomes in online coursework. Social presence is the "degree to which a person is perceived as a 'real person' in mediated communication" (Gunwardena & Zittle, 1997, p.9). The study of 121 student participants addresses the following questions: 1) What is the evidence of social presence in students' communication in an online discussion forum and in an attitudinal survey? 2) What pedagogical methods affect students' perceptions of social presence? and 3) What is the relationship between social presence and students' learning outcomes? The regression model revealed that students with higher demonstrations of social presence in discussion forum posts had statistically significantly higher ratings on the CAT. This seems to indicate that social presence influences student outcomes on written assignments.

Keywords: Social Presence, online community, Classroom Assessment Techniques

I. Introduction.

The internet has become an established part of higher education. Web access has increased dramatically over the last ten years, with 79% of adults and 93% of teenagers online in 2009 (Pew Internet & American Life Project, 2010). More than one in four college students take classes online and the percentage of students enrolled in internet coursework grew by 17% in 2008 (Allen & Seaman, 2010). Universities are experiencing increasing demands for online courses (Allen & Seaman, 2010), in the era of web 2.0. Modern college students are used to an interactive experience with the internet, where knowledge is mutually constructed (Greenhow, Robelia, & Hughes, 2009). This has created a preference for learning experiences that incorporate interactive media (Greenhow et al., 2009). As a result, instructors and faculty members have become increasingly interested in assessing the factors that make a successful learning environment for students online.

As learning environments have moved increasingly to computer-mediated formats, instructors have become concerned with the quality of the online educational experience (Hostetter & Busch, 2006). Researchers have become increasingly interested in how to apply the hallmarks of successful face-to-face interaction in online formats. A theory that is increasingly seen as useful is social presence theory. Biocca and associates sent a strong call for more research and theory development of social presence in mediated environments (Biocca, Harms, & Burgoon, 2003). What followed is a variety of

¹ Assistant Professor, School of Social Work, Indiana University Bloomington, chostett@indiana.edu

recent publications on the topic (e.g., Kehrwald, 2010; Ponkanen, Alhoniemi, Leppanen, & Hietanen, 2011; Portnoy, Smoak, & Marsh, 2010; Schultze, 2010).

Social presence is the “degree to which a person is perceived as a ‘real person’ in mediated communication” (Gunwardena & Zittle, 1997, p.9). Social presence addresses the amount of salience one person has in interaction with another (Richardson & Swan, 2003; Tu, 2002). Gunawardena’s early work found that “...users of computer networks are able to project their identities whether ‘real’ or ‘pseudo,’ feel the presence of others online, and create communities with commonly agreed on conventions and norms ...” (Gunawardena, 1995, p. 151). The ability to establish one’s identity, perceive the identity of the other, and build online communities has been well-documented since the work in the 1990s (Coomey & Wilczenski, 2005; Garrison, 2007). The important issue at this point is whether community leads to increased learning.

There is an emerging body of research that connects social presence with learning outcomes in online coursework. Picciano (2002) evaluated the link between social presence and student performance in a graduate course for education. Twenty-three students participated in the study, eight of whom had taken an online class previously. Students were measured on satisfaction and perception of social presence, as well as a written assignment and examination. Students with higher levels of social presence did better on a written assignment, but not significantly different with the examination (Picciano, 2002). In a sample of 228 students enrolled in online classes, students were surveyed about course perceptions, peer interactions and perceived learning outcomes. Self reported peer interactions were strongly related to self-reported learning outcomes (LaPointe & Gunawardena, 2004). Swan and associates developed and tested a 34-item instrument to measure the relationship between social presence and learning at four higher education institutions, with encouraging results (Swan, Richardson, Ice, Garrison, Cleveland-Innes, and Arbaugh, 2008). Increasingly, the call for expanding inquiry on social presence in online courses is for researchers to study the possible relationship between social presence and learning outcomes (Biocca et al., 2003; Garrison, 2007). It is no longer sufficient to examine whether a feeling of belonging to an online learning community exists, rather, we need to learn whether this perception matters for students’ learning.

II. Purpose of Study.

The study examines the relationship between social presence and students’ learning outcomes. Building on previous work (Author, 2006), we examine data from four sections of online courses. The previous work demonstrated that students perceived and valued the instructor’s course design that supported the creation of a safe learning community, which is purported to help students take risks and think critically (Bonk & Cunningham, 1998, Wegerif, 1998). In this work, we seek to understand the connection between the feeling of community and the knowledge gained in the course. The study addresses the following questions:

- 1) What is the evidence of social presence in a) students’ communication in an online discussion forum and in b) an attitudinal survey?
- 2) What pedagogical methods affect students’ perceptions of social presence?

- 3) What is the relationship between social presence and students' learning outcomes?

III. Method.

A. Procedure.

Over a period of two years, 121 students participated in a mixed-methods study examining the amount of social presence they perceived, the amount of social presence they demonstrated, and the relationship between those factors and their achievement on a Classroom Assessment Technique measure (Angelo & Cross, 1993). Multiple methods were used in order to balance some of the disadvantages of one method with the advantages of others (Padgett, 1998). Combining quantitative and qualitative methods provided data triangulation and a more complete viewpoint (Padgett, 1998). Social scientists have promoted the use of the multi-method approaches (Bisman & Hardcastle, 1999; Grinnell, 1997; Sherman & Reid, 1993). An established survey on perception of social presence was used (Richardson & Swan, 2003), and students' postings were analyzed using a method devised by Rourke, Anderson, Garrison, and Archer (1999).

B. Participants.

Out of a possible 142 students in four sections of an online seminar, 121 learners participated in all aspects of the study. Participants were selected purposively, in that all students in the four sections observed in this case study were offered the opportunity to participate. The resulting response rate was 85 percent. All students were female, which is not unusual in our discipline. There were nine students of color, five in one online class and four in a second online class. Because the students of color could easily have been identified since they were so few, the university's Institutional Review Board did not give us permission to link their demographic background to their responses. The average number of online courses taken by students was about two.

C. Instruments and Procedures.

Social Presence Survey. An established survey on perception of social presence was used (Richardson & Swan, 2003). The survey was distributed to all students at the end of the course. Perception of social presence was specifically explored in three main teaching methods including discussion forums, PowerPoint presentations, and WarmUps – weekly graded papers on readings (Novak, Patterson, Gavrin, & Christian, 1999). The survey response options placed disagree options at the low end and the agree options at the high end of the 6-point scale. The survey enables researchers to understand students' perceptions of the social presence they experience in the course in general as well as in specific course activities.

Each student who returned the survey, complete or incomplete, by email to a research assistant received one point toward his or her final grade. Because students were given one point whether they returned a blank survey or a completed survey, the Institutional Review Board determined that there was not undo pressure compelling

students to respond. The research assistant removed names, assigned identification numbers, and entered survey data into SPSS for analysis. The researchers had no access to the names of students who completed the survey data at any point.

Content analysis of online discussions. Students' postings were analyzed using a method devised by Rourke, Anderson, Garrison, and Archer (1999). During the course, seminar participants were required to participate in online discussion forums, write weekly papers synthesizing readings, and contribute to dyadic PowerPoint presentations. In order to facilitate social presence in the course, the instructor provided prompt and detailed feedback on assignments and modeled social presence in communication with students. Social presence was demonstrated by the instructor using student names, offering personal context, and expressing feelings and humor as appropriate. Discussion forum comments were analyzed by a research team to look for concrete examples of social presence including affective, interactive, and cohesive components (Rourke, Anderson, Garrison, & Archer, 1999). Affective comments included expressions of emotions, use of humor, or self-disclosure; interactive comments quoted other students' messages, referred explicitly to others' messages, asked questions, complimented or expressed appreciation, or conveyed agreement; and cohesive comments used vocatives, addressed or referred to the group using inclusive pronouns, or incorporated phatics or salutations. Comments reflecting one of the three categories above were counted as demonstrating social presence.

Classroom Assessment Technique ratings. A Classroom Assessment Technique (CAT) was used to measure the relationship between social presence and students' learning outcomes. The CAT asked course participants to write a statement that they might say to a biological parent (or parents) explaining that parental rights would be terminated and the parent's child (or children) would be adopted out. The statements were analyzed using a rubric developed by the research team and based on the grading criteria of the principle investigator (see Figure 1). Each CAT was evaluated by two independent raters. The rubric dimensions were rated using the following scale: especially good = 3, typical = 2, off-base = 1, and none (no reference to a dimension) = 0. The maximum possible score was 18.

	Especially Good	Typical	Off-Base	None
States Problem				
Establishes Authority				
Demonstrates that Well-being of Child is Paramount Concern				
Shows Empathy				
Shows Concern				
Establishes Plan/Offers Services				
Grand Total				

Figure 1. Sample CAT Evaluation Rubric

IV. Results.

A. Descriptive Statistics.

Descriptive statistics were calculated to answer both components of the first research question. The first component asks if there is *evidence of social presence in students' communication in a discussion forum*. Out of 4,000 postings, 86.45 percent (SD = 0.08) of the individual posts demonstrated social presence by including affective, interactive, or cohesive comments. While it is difficult to say what a strong amount of social presence would be in an online discussion forum, a rating of 86.45 percent appears to be on the higher end of the scale.

Seeking to answer the second component of the first research question, asking whether or not there is *evidence of social presence in an attitudinal survey*, 121 questionnaires were analyzed. The overall range was 32 to 60, out of a possible 0 to 60. The overall mean score was 51.4 (SD = 6.22), which can be considered on the high end of the scale. This indicates that students perceived a high degree of social presence in the course. Reliability testing for the survey instrument found an alpha of .95, which compares favorably to the reliability score of .88 found by Gunawardina and Zittle (1997). Principal components factor analysis with varimax rotation showed two factors: 1) student perception of social presence and 2) student satisfaction with the learning community. Table 1 provides data on the means and standard deviations of these two variables.

Table 1. Mean and standard deviation for social presence variables.

Measures	Mean	St. Dev.
SP in Discussion Forum*	86.45	.08
Perceptions of SP Survey**	51.35	6.22

N of students = 121

*N of postings = 4,000

**Response options of 1-6, 10 questions

B. Pedagogical Method Analysis.

The second research question asks what pedagogical methods affect students' perception of social presence. The question we sought to answer through the regression analysis was, "What pedagogical methods affect students' perceptions of social presence?" In the Social Presence Survey, students answered questions about their perceptions of the social presence in specific course activities. We analyzed students' perceptions of three main teaching methods, a discussion forum, PowerPoint presentations, and Warm-Ups – weekly graded papers on readings. The mean score for the discussion forum was 49.56 (SD = 8.50), the mean score for the PowerPoint presentations was 47.95 (8.19), and the mean score for the Warm-Ups was 38.42 (11.10). Ordinary Least Squares (OLS) regression tests were run for each variable separately. The discussion forum ($B=.47$, $p<.01$, $R^2=.42$), PowerPoint presentations ($B=.33$, $p<.01$, $R^2=.19$), and Warm-ups ($B=.25$,

$p < .01$, $R^2 = .21$) were all found to have a significant effect on perception of social presence. This indicates that students perceived all three of these teaching methods as positively contributing to their perceptions of social presence in the online class.

In order to test the strength of the three teaching methods further, we conducted a Multiple Regression analysis on the three methods as a collective model. This holds the effects of other variables constant. When all three methods are analyzed together, the only significant contributing variable is the discussion forum ($B = .44$, $p < .01$). The model accounts for 44 percent of the variance in students' perception of the effect of these teaching methods on their feelings of social presence (see Table 2). It appears that these students felt that the most effective teaching method for increasing their feelings of connection and community in this online course was the discussion forum. Considering that, as stated above, 86.5 percent of students' discussion forum posts were evaluated as demonstrating social presence, this positive perception of discussion forum makes sense.

Table 2. The effect of pedagogical methods on students' perceptions of social presence.

Methods	B	Std. Error
Warm-Ups	0.10	0.05
Discussion Forum	0.44*	0.07
PowerPoint	-0.06	0.08
R^2	.44	

N = 121, *p. < .01

C. Student Learning Outcome Analysis.

In order to understand more about social presence and learning, we combined social presence survey scores and demonstration of social presence in discussion forums into one variable. Multiple regression was then used to analyze the contribution of this variable on student learning outcomes. This is an attempt to answer the research question, "What is the relationship between social presence and students' learning outcomes?" Demonstration of social presence was determined by the content analysis described above and student learning outcomes were measured by scores on the Classroom Assessment Technique, also described above. Table 3 shows that demonstration of social presence ($B = 45.22$, $p < .01$) was found to be the only significant contributor to student learning outcomes. In other words, students who provided the highest amount of social presence had the highest scores on the Classroom Assessment Technique.

D. Discussion.

What is the evidence of social presence? Students demonstrated a high amount of social presence in the discussion forum with an average of 86.45 percent of comments reflecting affective, interactive, and cohesive components. Students who displayed more social presence in the discussion forum also perceived more social presence in the survey. Overall, perception of social presence was high. With response options of 0 – 6, with 6

being the most positive, and with 10 questions, an overall mean of 51.35 indicates a high level of social presence. Additionally, this mean was highly correlated with the number of online courses previously taken by students. This correlation leads to questions of whether or not there is a type of student who selects online courses or if the ability to perceive social presence online is developed with the more online courses students take. Also, students on one campus had significantly higher scores on this scale than students on the second campus. Students on the second campus previously had the principle researcher as a teacher for two or three courses and several expressed wishing they could see the principle researcher in the classroom. These students were unable to interact with the principle researcher in a face-to-face setting as they had hoped. Further research might explore if perception of social presence is influenced by this type of expectation.

Table 3. The effect of social presence variables on student learning outcomes.

Perceived Social Presence	B	SE B
in WarmUp	0.05	0.12
in Discussion Forum	0.30	0.18
in PowerPoint	-0.16	0.18
Overall Perception	-0.41	0.21
Demonstrated SP in Discussion Forum	45.22*	12.18
R ²	.13	

N = 121, *p. < .01

What pedagogical methods affect students' perceptions of social presence? The response options on the attitudinal survey had the disagree options at the low end and the agree options at the high end of a 6-point scale. Based on the resulting scores related to specific methods, the discussion forum demonstrated the highest amount of perceived social presence, followed by the PowerPoint presentations, and finally the Warm-Ups. These findings make sense in that the discussion forums were the most interactive of the three teaching methods. The Warm-Ups were the least interactive, in that they were communication between each student and the professor only. Setting up a discussion forum with questions and grading that reward students for thorough and thoughtful answers can be seen to be profitable for increasing students' sense of belonging to the online community.

What is the relationship between social presence and students' learning outcomes? The regression model revealed that students with higher demonstrations of social presence in discussion forum posts had statistically significantly higher ratings on the CAT. This seems to indicate that social presence influences student outcomes on written assignments and supports findings in other studies (LaPointe and Gunawardena, 2004; Lee, Jeong, Park, Ryu, 2011; Picciano, 2002; and Swan, Richardson, Ice, Garrison, Cleveland-Innes, and Arbaugh, 2008). Students who demonstrated social presence in an online setting performed better on the assignment. While the evidence is clear in this instance, generalizing the results must be considered cautiously and in conjunction with

other studies due to the small sample size and case study methodology. More research on the relationship between social presence and learning is clearly indicated to aid faculty who design courses in a mediated environment.

E. Limitations.

Generalizability is challenged in the study, since the participants may be different from other students due to their previous relationships from other classes. Social work majors, however, provide valuable insights for an exploratory study. They are trained to be reflective and self-aware, have experience in engaging and active classrooms, and provide some ethnic diversity (7%). When working with any student-participants, however, social desirability might be a concern. Efforts were made to minimize the influence of social desirability by keeping the surveys anonymous and online (completed without the teacher's presence and submitted to a research assistant unknown to the students). Additionally, all students have had two research classes and have studied social desirability which may have increased participant awareness of the importance of answering surveys with honesty.

V. Conclusion.

The study builds on a growing body of research applying social presence theory to online communication. The social presence scale originated by Gunawardena and Zittle (1997) seems to be a useful tool. Social presence may be a critical element to successful online instruction. Findings from this sample indicate that social presence increased student performance. Instructors planning online course work can model strong social presence expectations through teacher immediacy skills. Future research should focus on collaboration among disciplines teaching entirely online in order to further explore the effects of context and disciplinary ways of knowing.

In a world increasingly focused on internet interaction, social presence theory speaks to the expectations students have for higher education. Faculty and institutions are taking heed of both the utility and the effectiveness of excellent online instruction. Helping students connect, both virtually and interpersonally, can motivate students for retention, as well as model important skills for their online life activities.

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