

The Effects of Teacher Social Presence on Student Satisfaction, Engagement, and Learning

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Abstract: This research experimentally manipulated the social presence cues in instructor's messages to students. The context was an online professional development one credit course with 1:1 mentoring of students. Additionally, student learning goals, beliefs about learning, and levels of trust were examined as factors that may mitigate the effects of social presence. Results indicate that social presence affects the learner's interactions and perception of the mentor but has no effect on perceived learning, satisfaction, engagement, or the quality of their final course product. These findings suggest social presence is a correlational rather than a causal variable associated with student learning. Exploratory analyses suggest no effect of student learning goals, but that trust is associated with performance.

Interaction is central to distributed education, especially in its current online incarnation (Picciano, 2002). The student-instructor interaction in online learning is highly valued by both teachers and students (Soo & Bonk, 1998) and increased student-teacher interaction is an important factor in motivating students (Coldeway, MacRury & Spencer, 1980). At the same time that online learning presents the opportunity for greater interaction, reality shows us that this promise is often not being fulfilled. Social presence has been proposed as a primary factor in creating the context for online participation. At its most basic level, social presence is simply the perception that there is another real person taking part in the interaction (Visser, Plomp, Amirault & Kuiper 2002, Tu & McIsaac 2002). More generally, it is considered a continuum reflecting the degree to which participants feel they know one another (Abdullah, 1999; Rourke, Anderson, Garrison & Archer, 2001).

Social presence was initially considered to be a set attribute of the communication medium itself based on its capacity to transmit secondary communication information such as facial expression and verbal intonation. Over time, however, social presence has evolved to include the specific interactions that take place within the medium (Walther, 1992) as well as users' subjective perceptions of these interactions. In this way, it is related to the face-to-face concepts of intimacy and immediacy which are based on individual behaviors and the perceptions of these behaviors.

Though computer mediated communication (CMC) does not support facial expression or verbal intonation as means for establishing social presence, context and presence can be conveyed in CMC through alternate means. Rice and Love (1987) found that to compensate for the lost non-verbal cues in computer mediated communication (CMC) users expressed the missing non-verbal cues in written form. Furthermore, CMC users often report positive relational behaviors (Walther, 1992; Baym, 1995) and perceive CMC as interactive, active, interesting and stimulating (Gunawardena, 1995). Importantly, it is not just communicating, but rather the style of communicating that leads to high levels of social presence in a CMC environment. Swan and Richardson (2003), Rourke, et al. (2001), and Abdullah (1999) have identified specific textual cues that contribute to a feeling of social presence in CMC.

The cues identified for promoting social presence coincide with many guidelines for facilitating online courses to promote learning through a sense of community (Collison, Elhaum, Haavind & Tinker, 2000; Solomon, 2000). However, there is little empirical data to support that guidance, and the findings that exist are almost entirely correlational. Higher student social presence is associated with greater interaction and use of CMC (Tu & McIsaac, 2002; Perse, Burton, Kovner, Lears & Sen, 1992) and greater social presence is also associated with higher levels of student satisfaction and perceived learning (Richardson & Swan, 2003). But within a correlational study, it

is certainly possible that the causal relation could be in the opposite direction: highly motivated and more able students will participate more and exhibit greater social presence. There may also be other variables impacting both social presence and motivation and learning.

Existing research on instructor social presence has taken place primarily in face-to-face classrooms using the related concepts of intimacy and immediacy: increased teacher immediacy behaviors are associated with increased affect for the course, its content, its instructor (Anderson, 1979), increased intent to take related courses and use the knowledge acquired (Kearney, Plax & Wendt-Wasco, 1985) and perceived learning (Sanders & Wiseman, 1990), however studies using objective measures of student learning have produced mixed results (Kelly & Gorham 1988; Anderson, 1979).

In sum, there is considerable correlational evidence to suggest that the social presence of the instructor in an online course is an important factor affecting student motivation and satisfaction. While there have been causal inferences made concerning this relationship, it is entirely possible that a third variable is impacting both social presence and performance. For example, we would expect highly motivated learners to both express greater social presence and demonstrate greater learning. In the work reported here, we have experimentally manipulated social presence in an authentic learning context to examine the causal impact on learning.

Social presence is indexed by the social presence cues found in the interaction of participants, e.g., taking a friendly tone in the postings and sharing personal information. In an experimental context, these cues would be manipulated so as to promote social presence and hence learning. However, there are numerous individual differences and situational variables such as students' perception of their own computer expertise (Perse, Burton, Kovner Lears & Sen, 1992), their perception of the privacy of the medium, and their level of trust (Tu & McIsaac, 2002) that could mitigate the effects of social presence cues.

In our own work, we are examining two such variables. The first factor is the individual's goals: if participants are in a course simply to fulfill a requirement, then we would certainly expect little impact of social presence cues on a feeling of knowing each other or on learning. However, if they are seeking to apply what is being learned, then high social presence may be expected to encourage participation, motivation, and satisfaction. The second factor is trust, a factor presumed to be central in the willingness of people to discuss openly with a stranger they cannot see. Individuals enter a course with an operating level of trust which may be high or low (Yamagishi & Yamagishi, 1994) and this may be expected to interact with the social presence level presented by the instructor.

The Current Study

The present study seeks to extend the existing research on social presence in three ways. First, this study will use one-to-one mentoring as the learning context with the instructor establishing the level of social presence. Second, we will examine the relationship of learning goals and trust to social presence. Finally, this is an experimental test of the effects of social presence (i.e. we will manipulate the level of social presence cues presented by the instructor) to determine if we can infer a causal effect of instructor social presence on student performance and satisfaction

In this study, instructors provided the same quality of feedback and amount of information to learners while varying the quantity of social presence textual cues associated with the feedback. We expect higher social presence to lead to a greater sense of learning and higher satisfaction. Finally, we expected that the modeling of the high social presence instructor will lead to higher social presence in their students' responses.

Method

Learning Environment

Students chose 1 of 35 courses to enroll in from the Learning to Teach with Technology Studio (LTTS - <http://ltts.indiana.edu>). Courses are short (25 hrs), entirely web based, self-paced, and individually mentored, and address technology integration - learner centered teaching. Course design is guided problem solving beginning with a curriculum problem; 4 to 7 tasks guide student work; and the outcome is a student designed lesson plan for his/her course (see Malopinsky, L., Kirkley, J. R., Stein, R. & Duffy, T., 2000).

Participants

Participants, 20 graduate students in education, were randomly assigned to a high or low social presence condition and to one of two mentors with the exception that those with no salaried teaching experience were equally distributed across the two social presence conditions.

Mentors

The two mentors had over five years teaching and more than 6 months LTTS mentoring experience. Each mentored five students in each condition. They introduced themselves at the start of the course, encouraged students, provided feedback, answered questions and otherwise interacted in response to students. Mentors were trained in responding with high and low social presence messages, had a reference guide of textual cues indicating social presence, and met periodically in the first days of the course to ensure consistency in cue usage.

Independent Variable

Mentors always provided the information and guidance they felt the student needed but varied the style of interaction that they used to convey this information. One might think of this as an engineering versus liberal arts style of communication. In the low social presence condition, the mentor provided the encouragement and feedback to students in a formal, efficient way. In the high social presence condition, the interactions were enhanced to make them more friendly and personal. Eight social presence cues identified in the research of Abdullah (1999) and Rourke et al. (2001) were used by the mentors with the high social presence group:

- β Humor / Playful Asides
- β Emotion
- β Self-Disclosure
- β Support or Agreement for an idea
- β Addressing people by name
- β Greetings / Phatics
- β Complimenting another's idea
- β Allusions of Physical Presence

Predictor Variables

In addition to social presence, three correlational variables were examined to explore their relationship to social presence and the outcome measures.

Trust: Yamagishi's (2001) extensive work on trust in uncertain situations is consistent with our interest in the importance of trust in student participation in online courses. Their measure of Generalized Trust consists of six Likert scale items with internal consistency (IC) of .72 to .79 (Yamagishi & Yamagishi, 1994). IC in the present study was .87.

Beliefs about Learning: Lacefield and Cole's (1973) "Educational Preference Scale" was used to measure the teachers beliefs about learning (see also Lacefield and Mahan, 1980). It consists of 30 bipolar items with a 7 pt scale. IC in this study was .83.

Intentionality: A series of seven questions asked students to rate their goals for taking the course. The scoring measured students' intentions related to a serious purpose for learning.

Outcome Variables

Perceived social presence: Four, five point Likert items asked students about the warmth and friendliness of the mentor's messages. The IC of the instrument was .85.

Perceived warmth of the mentor: This was measured through seven sets of bipolar items adapted from the original set of six bipolar scales used to measure social presence (Short, Williams & Christie, 1976) with IC =.96. In addition, four, five-point Likert items assessed satisfaction in interacting with their mentor with IC =.90.

Perceived Knowledge of the mentor: Eleven Likert scale items asked students how well they felt they knew what their mentor was like as a person and how confident they were that the mentor did or did not possess particular characteristics. The scale had an IC of .93.

Student social presence: We expected that students in the high social presence condition would interact more with the instructor and that their messages would reflect a high level of social presence. Amount of interaction was indexed by both the number of messages posted and the number of words per message. Level of social presence was indexed as follows: each message was divided into idea units and each idea unit was scored as to whether or not it included one of social presence cues identified earlier. Inter-rater reliability of social presence scoring was .82.

Student satisfaction: Eleven Likert items assessed “Student Satisfaction” along three dimensions: satisfaction; benefits of the learning experience; and interest in taking another course. The IC of the scale was .96.

Student engagement: Thirteen items assessed four dimensions of Student Engagement: engagement in the course; amount of effort put forth; the value placed on the effort; and the relevance to their learning goals. The IC of the scale was .94.

Perceived learning: Four items assessed the amount students felt they learned and the impact they felt that the course had on them. The IC of the scale was .92.

Quality of final course product: The final course products (a completed lesson plan) were assessed by two raters using a sixteen item, four point rubric that addressed the quality of the lesson plan with regards to technology integration and inquiry based learning. The inter-rater reliability coefficient for the rubric was .89.

Procedure

The researchers met with students in their class to solicit participation. All other contact was web based; the courses were not discussed in class until the work was completed. Students began by choosing and enrolling in a course from the LTTTS catalogue. They then completed the surveys which were available online. Students started their course when they wanted during the next week and had six weeks to complete their work. In the course, students had 5 to 7 tasks to complete as part of the guided problem solving approach. During the course, mentors provided welcoming messages, encouragement as necessary, answered questions, and provided feedback on each task. Upon completing the course and the course evaluations, students were prompted by their mentor to complete the post surveys, which they accessed online.

Results

Was the manipulation of social presence perceived by the participants? A one-tailed t test of the mean rating of the “friendliness” of the mentor’s messages yielded a significant effect ($t=2.15, p<.05$). As shown in Table 1, both groups saw the messages as friendly (a score less than 3) but the high social presence participants saw them as more friendly. Using the square root of the pooled variance, the effect size was calculated to be .88.

Social presence theory suggests that the friendliness of the messages should transfer to the perceived friendliness of the mentor and even to the perception of how well they feel they know the mentor (Abdullah, 1999). The effect of social presence on perceived friendliness of the mentor approached significance ($t=1.99, p<.06$). The calculated effect size of .79 prompted us to conduct a power analysis (Rosner, 1995). Setting power at $\geq .80$ and significance at $p < .05$, the analysis indicated that a sample size of 20 participants would be necessary to achieve significance. However, there was no significant effect on perception of knowing the mentor ($t=1.18$). Thus, there is a tendency for the effects of social presence to generalize to the perception of the person, but it is not strong. Since low social presence mentors were still considered friendly perhaps a more robotic low social presence mentor would yield a significant effect. Despite the lack of significance, a calculated effect size of .53 indicates that a larger sample size might help. A power analysis (Rosner, 1995), setting power at $\geq .80$, significance at $p < .05$, indicated that a sample size of 44 participants would be necessary to achieve significance.

Table 1. Mean (standard deviations) of rating of friendliness of message, nature of mentor, and “knowledge” of the mentor for students with high and low social presence mentors on a five point scale with 1= warm and familiar.

Condition	Perception of Message*	Nature of Mentor **	Familiarity of Mentor
High social presence	1.41 (0.67)	1.77 (.64)	2.10 (.73)
Low social presence	2.24 (1.01)	2.50 (1.00)	2.51 (.80)

*p<.05 **p<.10

We also expected the high social presence participants to respond to the messages by being more interactive and friendly. There is indeed a strong effect on the length of the student messages, with messages from participants in the high social presence condition being over twice as long as those in the low condition ($X=90.4$ and 38.4 words respectively). A one-tailed t test ($t=2.56$, $p<.05$) revealed this difference to be significant, with an effect size of 1.0 . Additionally, students in the high social presence condition showed a higher degree of social presence in their messages to the mentor. A scoring of idea units for the presence of one of the social presence cues demonstrated that high social presence participants used social presence cues in 58% of the idea units they wrote, compared with 44% for the low social presence condition. A one-tailed t test ($t=2.21$, $p<.05$) revealed this difference to be significant with an effect size of $.88$.

The results indicate that the social presence of the mentor was perceived by the students, somewhat impacted their perception of the mentor, and did impact their interaction with the mentor. That is to say, the manipulation of social presence seem to have created a more social and friendly atmosphere. However, the critical question is whether the increased social presence impacted the student’s perception of their learning experience and their learning outcomes. Here we failed to find any significant effects. One tailed t tests failed to yield significant effects for student satisfaction with the learning experience, their perception of their engagement with the material, or their perception of how much they learned ($t<1$, $t=2.09$; and $t=1.01$ respectively). The mean ratings are presented in Table 2 where, if anything, the low social presence students gave more favorable ratings on all three measures, with the effect on engagement reaching significance with a two tailed test. The reversal is unexpected and unexplained at this time. However, most importantly, while the manipulation of social presence impacted the atmosphere of the course, there was no effect on perceived learning, engagement, or satisfaction.

Table 2. Mean (standard deviations) of student engagement, perceived learning & satisfaction for high and low social presence students on a five point scale with 1= positive response and mean final product score on a four point scale with 3 = the maximum score possible.

Condition	Student engagement	Perceived learning	Student satisfaction	Final product score
High social presence	2.51 (.64)	2.27 (.73)	2.42 (.83)	2.23 (.33)
Low social presence	1.84 (.78)	1.90 (.89)	2.14 (1.1)	2.14 (.42)

Finally, we examined the actually performance of students in the courses. The outcome for all the LTTS courses enrolled in by the students is a lesson plan tailored to that teacher’s classroom which should: be inquiry based, address curriculum standards, integrate technology as a tool for student inquiry, and offer authentic and/or competency based assessments. A scoring rubric was developed based on these instructional goals; the criteria used are shown in Table 3. For each criterion the rubric included one to four specific statements. Raters graded the products on a four point scale to determine the score for each criterion. The final product score was taken as the average of the eight criteria scores. Two raters, not involved in the mentoring scored each of the products independently. Initial practice and training was conducted on products from other students who completed LTTS courses, with several rounds of training and refinement of the scoring rubric. Inter-rater agreement on the scoring was $.89$. A t test comparing high and low social presence groups on rubric scores failed to yield a significant effect ($t<1$), thus adding to the consistency of the findings that social presence supports the social climate but does not impact outcomes, either perceived or real.

Table 3. Scoring rubric criteria used to grade course products.

Criteria	
1.	Learner-Centeredness
2.	Inquiry-Based
3.	Engagement
4.	Goals/Objectives
5.	Curriculum and Standards
6.	Assessment
7.	Role of the Teacher
8.	Use of Technology

We will be conducting regression analyses looking at beliefs about learning, trust, and learning goals on the outcome variables and those will be reported in June. Preliminary data suggests that trust is an important variable, with beliefs and goals having no relationship to performance. The mean trust scores (measured prior to learning) were identical for high and low social presence groups, thus indicating that any effects will be independent of the effects of social presence. With that in mind, we used a median split to create high and low trust groups. Analyses indicated that the effect of trust on the perception of the friendliness of the mentor and on the perception of “knowing” the mentor approached significance ($t=1.91, p<.07$ & $t=1.75, p<.10$ respectively). Thus, independently of the social presence of the instructor, there is a tendency for high trust individuals to perceive the instructor as friendlier and more familiar. Unfortunately, the N for this study is not sufficient to look for interaction effects. Finally, a comparison of the trust groups indicated that the difference in satisfaction with the learning experience also approached significance ($t= 1.77, p<.10$) with mean ratings for low and high trust being 2.58 and 1.83 respectively.

Discussion

Social presence has been viewed as a critical factor in the success of online learning, High social presence is thought to create an approachable environment and hence more satisfying learning experience and greater learning. Additionally, it is believed to create an atmosphere where students are more willing to ask questions and interact, again, with the expectation that this interaction will promote learning. Correlational studies have offered support for these hypotheses. However, the casual approach in this study, with the manipulation of social presence, failed to support a causal relationship. While social presence increased the amount written by the students and influenced their perception of the instructor, it had no effect on perceived learning, satisfaction, engagement or the quality of the final course product.

One explanation of the results found is that it may be that social presence is more of a binary variable. That is, some threshold level of social presence is important, but once the threshold is reached, there is little additional impact. In practical terms, a learner must feel there are other people involved who are invested to some degree, but that is all that is necessary. It is important to note that while a significant difference was found in the level of social presence perceived between conditions; both groups did see the messages as friendly. Thus both conditions may have exceeded the threshold level of social presence necessary. This interpretation, of course, is considerably different from the more general view that the higher the degree of social presence (and thus the bonding of individuals) the greater will be the level of learning in an online environment.

In reflecting on learning experiences, one might wonder why social presence would be expected to impact learning. There are many courses which students find very friendly and even fun, but where little is learned. It is the intellectual demand of the course, rather than the social aspect that we may expect to be a causal factor in learning.

But what role might social presence play? We suspect it may be an important causal variable in students’ persistence. Distance education often has a very high drop out rate which is often attributed to a feeling of isolation. There is rich research literature suggesting that the sense of academic affiliation with others is a primary variable associated with retention of college freshman (Braxton, Milem and Sullivan, 2000). Social presence may serve a

similar persistence role in online learning. By the time of ICLS we will have extended these analyses, with expectations of replicating the study with a larger sample. Further, we will extend both the content analysis and the statistical analysis of the variables.

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Acknowledgments

We would like to thank Carolyn Scholten for mentoring and for her contributions to the research process and Nari Kim and Sunnie Lee for their work analyzing the social presence of the student messages.