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2004

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Reference:

Gunawardena, C. (2004) Designing the social environment for online learning: the role of social presence. In D. Murphy, R. Carr, J. Taylor, & T. Wong (Eds.), Distance Education and Technology: Issues and Practice (pp. 255-270). Hong Kong: Open University of Hong Kong Press.

Designing the Social Environment for Online Learning: The Role of Social Presence

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Introduction

A major challenge to designing online learning is the development of appropriate means to facilitate the social environment that is critical for higher order learning in many disciplines. In many online learning designs, the majority of resources are channeled to web interface design and technology, while little or no resources are devoted to facilitating the teaching and learning process, the negotiation of meaning and the validation of knowledge among peers and instructors that depends on a conducive socio-cultural environment and adequate learner support. This paper seeks to address this issue by examining one factor, social presence that has been shown to influence the social environment of online education.

Why Examine the Social Environment of Online Learning

Resnick (1991) has observed that in “most psychological theory, the social and the cognitive have engaged only peripherally, standing in a kind of figure-ground relationship to one another rather than truly interacting” (p. 1), and advocates that we undo this figure-ground relationship between cognitive and social processes. Much of human cognition is so varied and so sensitive to cultural context that we must also seek mechanisms by which people actively shape each other’s knowledge and reasoning processes. According to the strong constructivist assumption, everything an individual knows is personally constructed, but directly experienced events are only part of the basis for that construction. Resnick argues that people also build their knowledge structures on the basis of what they are told by others, orally, in writing, in pictures, and in gestures. Our daily lives are filled with instances in which we influence each other’s constructive processes by providing information, pointing things out to one another, asking questions, and arguing with and elaborating on each other’s

ideas. She points out that recent theories of situated cognition are challenging the view that the social and the cognitive can be studied independently, arguing that the social context in which cognitive activity takes place is an integral part of that activity, not just the surrounding context for it.

Recent theories of learning, therefore, have made an attempt to blend the social and the cognitive in the design of learning environments. These are exemplified in discussions on the relationship of affect and cognition from a neurobiological perspective in which emotion is seen as an integral attribute of cognition (Adolphs & Damasio 2001, Davidson 2002), cognitive sociology (Zerubavel, 1999) which reminds us that we think both as individuals and as human beings and that what goes on inside our head is also affected by the particular 'thought communities' to which we belong, socially shared cognition (Resnick, Levine and Teasley (1991), socioconstructivism, which emphasizes the importance of social processes in individual knowledge building (Vygotsky 1978; Teasley, S., & Roschelle, J., 1993), and sociocultural perspectives which describe learning from a cultural point of view. By stressing the interdependence of social and individual processes in the co-construction of knowledge, sociocultural approaches view semiotic tools or cultural amplifiers as personal and social resources, and hence, mediating the link between the social and the individual construction of meaning (Vygotsky, 1978).

Lave (1991) extends these views further by stating that we need to rethink the notion of learning, treating it as an emerging property of whole persons' legitimate peripheral participation in communities of practice. Such a view sees mind, culture, history, and the social world as interrelated processes that constitute each other, and intentionally blurs social scientists' divisions among component parts of persons, their activities, and the world.

Computer-mediated communication (CMC) has led to the emergence of networked learning communities, or 'cybercommunities' bound by areas of interest, transcending time and space (Jones, 1995, 1997). It is the ability to facilitate critical communities of inquiry to engage in higher order thinking in many disciplines that is one of the most important contributions of this medium for online learning.

One step toward understanding how to build the social environment that would support cognitive processing, is to examine research on 'social presence' and its relationship to the social context of online learning. Discussing the role of social presence in online learning, McIsaac and Gunawardena (1996) and Tammelin (1998) observe that it can be linked to the larger social context including motivation, interaction, group cohesion, verbal and non-verbal communication, and social equality.

Purpose of this Paper

The purpose of this paper is to (1) examine literature on the role of social presence in online learning, (2) discuss the results of a study we conducted on

‘social presence’ and its relationship to learner satisfaction in an online learning environment (Gunawardena and Zittle, 1997), (3) examine areas for future research, and (4) draw implications from the studies discussed for designing the social environment for online learning.

Review of Literature

The importance of studying computer-mediated communication (CMC) from a social psychological perspective has been emphasized by recent international communication research (Jones 1995; Spears and Lea 1992; Walther 1992). Lombard and Ditton (1997) in an extensive review of literature on the concept of presence in telecommunications environments identify six interrelated but distinct conceptualizations of presence, and equates “presence as social richness” with social presence. Spears and Lea (1992) discuss three approaches to analyzing the social psychological dimension of mediated communication from the "social cues perspective": (1.) the social presence model developed by Short, Williams and Christie (1976), (2.) Rutter's (1987) cuelessness model, and (3.) the reduced social cues approach put forward by Kiesler, Siegel and McGuire(1984). They note that out of these three approaches the most influential theoretical framework is the social presence model (Short et al. 1976).

Short et al. (1976) postulated that the critical factor in a communication medium is its "social presence" and defined it as the "degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships..." (p. 65). This means the degree to which a person is perceived as a "real person" in mediated communication. They define social presence as a quality of the medium itself and hypothesize that communications media vary in their degree of social presence. The capacity of the medium to transmit information about facial expression, direction of looking, posture, dress and nonverbal cues, all contribute to the degree of social presence of a communications medium.

Social presence is described as a construct that comprises a number of dimensions relating to the degree of interpersonal contact. Two concepts associated with social presence are: Argyle and Dean's 1965 concept of "intimacy;" and Wiener and Mehrabian's 1968 concept of "immediacy" (cited in Short, et al. 1976). Short et al. (1976) suggest that the social presence of the communications medium contributes to the level of intimacy which depends on factors such as physical distance, eye contact and smiling. Therefore, television rather than audio-only communication makes for greater intimacy, other things being equal, because of its ability to convey non-verbal cues such as eye contact and smiling. Text-based CMC, devoid of nonverbal codes that are generally rich in relational information occupies a relatively low position as a medium that is capable of generating intimacy. On the other hand, immediacy is a measure of the psychological distance, which a communicator puts between himself or herself and the object of his/her communication. A person can convey immediacy or non-immediacy nonverbally (physical proximity, formality of dress, and facial expression) as well as verbally. Immediacy enhances social presence. Therefore, according to Short et al.'s

(1976) argument, social presence is both a factor of the medium, as well as that of the communicators and their presence in a sequence of interaction.

A detailed discussion of the literature on social presence is found in Gunawardena (1995). A common theme in the conclusions of social presence studies conducted in traditional face-to-face classrooms is that teacher "immediacy" is a good predictor of student affective learning across varied course content. (Kearney, Plax, and Wendt-Wasco 1985; Christophel 1990; Gorham 1988). In CMC research, social presence theory has been used to account for interpersonal effects. CMC with its lack of nonverbal communication cues is said to be extremely low in social presence in comparison to face-to-face communication. However, field research in CMC often reports more positive relational behavior and has indicated the development of "online communities" and warm friendships (Walther 1992; Baym 1995). Walther (1992) notes that a significant number of research studies that have explored the effects of CMC have failed to account for the different social processes, settings, and purposes within CMC use as well. Research has reported that experienced computer users rated e-mail and computer conferencing "as rich" or "richer" than television, telephone and face-to-face conversations. Therefore, the conclusion that CMC is less socioemotional or personal than face-to-face communication is based on incomplete measurement of the latter form (Walther 1992).

Social Presence and Learner Satisfaction

Because a computer conference is essentially a group-based learning environment where the teacher's role is more of a facilitator than the main source of information, social presence should be measured from a group perspective; participant reaction to other participants and activities within the group, rather than as a classroom's reaction to the teacher's social presence. Therefore, we conducted our study from a group perspective.

Based on the GlobalEd inter-university computer conference, we examined how effective "social presence" is as a predictor of overall learner satisfaction when compared to other variables in a text-based medium (Gunawardena and Zittle 1997). The GlobalEd computer conference linked graduate students in several universities to share and discuss research and experience distance education by using CMC. The participants of this study were fifty students from five universities: San Diego State (N=8), Texas A & M (N=11), University of New Mexico (N=14), University of Wisconsin-Madison (N=7), and University of Wyoming (N=10), who participated in the GlobalEd conference. Demographically, 62 percent were females, and the mean age was 40 years.

We developed two regression models to determine if social presence could predict learner satisfaction in a computer conferencing environment. We were interested in studying learner satisfaction because computer conferences, even though they are set up as academic exercises, are social environments (Harasim 1993; Spears and Lea 1992: Walther 1992) in which a strong affective component resides. If learners are satisfied with computer- mediated learning experiences, it is likely that the affective needs of the learning process were taken care of, and they are more likely to enroll in such experiences again.

The first stepwise regression analysis examined eight independent variables that were correlated with the dependent variable learner satisfaction to determine which of these variables were the highest predictors of learner satisfaction. These were: 1. social presence (Spres), 2. active participation in the conference (Active), 3. attitude toward CMC (Attitude), 4. barriers to participation which included technical problems and lack of access (Barriers), 5. confidence in mastering CMC (Capable), 6. perception of having equal opportunity to participate in the conference (Equal), 7. adequate training in CMC at participant's site (Trained), and 8. technical skills and experience using CMC (Tech). Reliability data using Cronbach's Alpha for the social presence scale which included 14 questionnaire items was .88. The questionnaire items addressed: the personal/impersonal nature of CMC, CMC as a medium for social interaction, comfort conversing through text, comfort introducing self, comfort participating in discussions, introductions forming a sense of online community, moderators creating a feeling of online community, moderators facilitating discussions, comparison of CMC and face-to-face discussions in terms of degree of impersonality, comparison of CMC and video conferencing in terms of degree of impersonality, comfort interacting with other participants, the acknowledgement of one's point of view by other participants, and the ability to form distinct individual impressions of participants.

The results of the first stepwise regression analysis converged on a four-predictor model revealing that Spres, Equal, Tech, and Attitude accounted for over 75% of the explained variance ($R=.87$, $F=19.82$, $df\ 4,26$, $MSe=12.418$, $p<.001$). Social presence (Spres) contributed about 58% of the variance, with student perception of having equal opportunity to participate (Equal), and Technical skills and experience using CMC (Tech) adding about 6%. Attitude toward CMC (Attitude) contributed approximately 5% of the explainable variance respectively. This analysis indicated that social presence was a very high predictor of learner satisfaction in this computer conference.

Because of issues related to sample size, we conducted a second regression analysis with the highest predictors of satisfaction in the first model. The stepwise regression was computed using Spres, Equal, Tech, and Attitude as the predictor variables based on the results of the previous analysis (i.e. relative predictive power of the variable.) This time the stepwise regression procedure converged on a three-predictor model revealing that Spres, Equal, and Tech accounted for over 70% of the explained variance ($R=.84$, $F=24.22$, $df\ 3,30$, $MSe=13.864$, $p<.001$). Social presence (Spres) alone contributed about 60% of the variance, with student perception of having equal opportunity to participate (Equal) adding about 6%, and technical skills and experience using CMC (Tech) contributed approximately another 4% of the explainable variance. The second analysis confirmed that social presence was a very high predictor of learner satisfaction in this computer conference.

Although care must be taken in generalizing these results due to sample selection and size, they suggest that social presence alone is a strong predictor of satisfaction in a text-based computer conference. This finding supports prior research that established social presence as a predictor of satisfaction in an interactive television class (Hackman

& Walker 1990). It also supports the view that the relational or social aspect of CMC is an important element that contributes to the overall satisfaction of task-oriented or academic computer conferences (Walther 1992; Baym 1995).

Additional Findings

Previous research had indicated that CMC users develop an ability to express missing nonverbal cues in written form by "emoticons" (icons that express emotion), the contrived sideways faces that can be made by combinations of punctuation marks (such as ☺, ;-), ☹), and, parenthetical metalinguistic cues such as "hmmm" or "yuk." (Hiltz 1994; Walther 1992). Such cues add affective information, contextualize the message, and indicate informality.

We were intrigued by the implications for other possible interactions when examining the effects of social presence on satisfaction. For example, since social presence appears to have a strong positive effect on satisfaction, even in a text-based milieu, did those participants somehow compensate for a lack of social cues inherent in the text-based medium? To explore this question participants were asked if they intentionally used emoticons to communicate their feelings within the text-based medium. Our results showed that at low levels of social presence the use of emoticons has no effect on satisfaction, while at higher levels of social presence, there is an improvement on satisfaction as emoticon use increases. This finding may suggest that participants who perceived a high level of social presence seemed to want to enhance their experience (and satisfaction) by utilizing alternative forms of socio-emotional expression; kind of a "rich-get-richer" scenario. This is supported by Steinfeld's 1986 study of social and task-oriented uses of e-mail (cited in Baym 1995) where those who were most likely to use computers socially did not perceive them as low in social presence.

Conversely, participants who judged social presence low seemed to not want to enhance their socio-emotional expression through this text-based medium. Did this group just throw up their hands in social frustration and try to muddle through a tedious CMC experience? Or was the social component ever important to them? This raises the question of individual differences along personality or social-psychological lines, and begs the need for future research to investigate individual differences (other than learning styles) as mediating factors in developing the social environment for online learning.

Walther's (1992) "social information-processing perspective" (P. 67) considers how relational communication changes from initial impersonal levels to more developed forms in CMC. This perspective recognizes that extended interactions should provide sufficient information exchange to enable communicators to develop interpersonal knowledge and stable relations. According to Walther (1992), the depersonalizing effects of CMC may be limited exclusively to initial interactions. A majority of GlobalEd participants agreed that there were more social and personal messages toward the latter part of the conference than during the initial stages (Mean 4.15, SD.74, on a Likert scale

of 1-5, with 5 expressing strong agreement). This has implications for building online communities.

In conclusion, this study (Gunawardena and Zittle 1997) has shown that social presence is a strong predictor of learner satisfaction in a computer conference. The results also indicated that participants who felt a higher sense of social presence within the conference, enhanced their socio-emotional experience by using emoticons to express missing nonverbal cues in written form. These findings have implications for designing online learning where equal attention must be paid to designing techniques that enhance social presence and the social environment. Instructors who are used to relying on nonverbal cues to provide feedback and who have a lesser-developed ability to project their personality will need to learn to adapt to the CMC medium by developing skills that create a sense of social presence. Johansen et al. 1988 (cited in Walther 1992) indicate that social presence can "be cultured" among teleconferencing participants. Research on social presence and CMC has indicated that despite the low social bandwidth of the medium, 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 that bind them together to explore issues of common interest.

Future Research

One question that needs to be examined in future research is the relationship between social presence and interactivity. Examining these two concepts, Rafaeli (1988, 1990) observes that social presence is a subjective measure of the presence of others as Short et al. (1976) defined it, while "interactivity" is the actual quality of a communication sequence or context. Interactivity is a quality (potential) that may be realized by some, or remain and unfulfilled option. When it is realized, and when participants notice it, there is "social presence". Lombard and Ditton (1997) have pointed out that highly interactive virtual environments could evoke a greater sense of social presence. Therefore, designing system interactivity into an online system based on simulation or artificial intelligence principles, where the learner interacts with interactive pedagogical agents who communicate with students to promote meaningful learning will be one way to enhance the social presence within the online learning system. Children's attachment to and relationship with characters or avatars in computer games may indicate that the system design itself is capable of generating social presence.

Tu and McIsaac (2002) examined dimensions of social presence using quantitative and qualitative methods and found that three dimensions of social presence—social context, online communication, and interactivity—emerged as important elements in establishing a sense of community among online learners. They observed that an increase in the level of online interaction occurs with an improved level of social presence and concluded that social presence is a vital element influencing online interaction. Further research is necessary to clearly define the constructs of 'social presence,' 'interaction' and 'system interactivity' and determine the dynamic interaction of these variables in an online learning environment.

Another area of research that has recently emerged is the examination of social presence and its relationship to online dialogue and learning through transcript analysis techniques. Rourke, Anderson, Garrison, and Archer (2001) examine the relationship of social presence and interaction in an online community of inquiry. They define social presence as the ability of learners to project themselves socially and affectively into a community of inquiry. In their model of a community of inquiry, social presence is an essential element that works to support cognitive and affective objectives of learning. They present a template for assessing social presence in computer conferencing through content analysis of conferencing transcripts and conclude with a discussion of the implications and benefits of assessing social presence for instructors, conference moderators, and researchers. Based on their work, Swan (2001) developed a coding schema to identify fifteen immediacy indicators that represent social presence, five each for affective, cohesive, and interactive responses in the discussion. Further research is necessary to validate these coding schemas and determine if they are useful in measuring social presence.

With the increasing globalization and internationalization of online programs, an emerging area for future research is to examine cultural perceptions of social presence. Tu (2001) conducted a study of how Chinese perceive social presence in an online environment. In a cross-cultural study of group process and development in online conferences in the United States (US) and Mexico, Gunawardena et al. (2001) found that social presence emerged as a theme addressed by both US and Mexican focus group participants. US participants felt that social presence is important to the smooth functioning of the group, to provide a sense that the members of the group are real people. Social presence can build trust and lead to self-disclosure, and building relationships certainly enhances civility online. The Mexican focus group participants on the other hand, felt that having personal information about the participants was not important. For these participants, the way interaction works online and how participants contribute to the conference is far more important than knowing personal information about other participants. There were differences in the way that US participants and Mexican participants perceived social presence and some of these differences could be attributed to cultural differences.

Implications for Designing the Social Environment for Online Learning

Research on social presence has shed light on the need to design the social environment that would facilitate both cognitive and affective learning. The instructor plays a critical role in facilitating social presence and the social environment in online learning. Social presence research has shown that teacher immediacy behaviors include both verbal and nonverbal actions such as gesturing, smiling, using humor, vocal variety, personalizing examples, addressing students by name, making eye contact, questioning, praising, reinforcing, initiating discussion, sharing personal experiences, encouraging feedback and providing timely feedback. Networked learning environments incorporating multimedia

formats now enable communication via video, graphics, audio, and text, and designers should develop social presence techniques appropriate to the medium.

Other than the instructor's role in creating social presence, several of the following design techniques can be used to create social presence and build the social environment for online learning based on learner characteristics and the specific context.

- Virtual Pubs or Cafes - a specific virtual space assigned for social interaction where participants can demonstrate a sense of their own social presence and where participants feel fully represented as human beings.
- Introductions – usually done at the beginning of a course where participants introduce their professional and personal identities and interests. The amount of self-disclosure that participants are comfortable with will vary depending on cultural background and in some cases introducing each other online may be more comfortable than self-introductions.
- Creating a sense of online Community – moderators or facilitators play an important role in community building activities, facilitating discussions, summarizing, and by being present online frequently.
- Timely feedback, encouraging participation, and rewarding contributions.
- Developing formats for interaction – that would enhance the presence of others in the community such as story telling, and sharing experiences.
- Virtual Costume party – an activity where social interaction can be generated by asking participants to assume identities and describe their costumes.
- Photo album of class members and instructor.
- A touch of humor – to get the group going as they attempt to get tasks done.
- Real time interaction – providing opportunities for real time interaction through chats, audio and video teleconferences, as well as face-to-face discussions.
- Encouraging the use of online conventions such as emoticons.

In order to build the social environment for online learning, the concepts of community, collaboration, and interaction must become central to course design. Assessment must reward collaboration, contribution to community, and products developed within the community. As in the Keresan Pueblo communities of New Mexico where giftedness is defined as an individual's ability to contribute to the good of the community (Romero & Schultz 1994), individuals should be rewarded for their participation in and contribution to the online learning community.

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