

**Student Satisfaction and Reported Learning in the SUNY Learning
Network: Interaction and Beyond - Social Presence in Asynchronous
Learning Networks**

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September 2001



PART I

A. Introduction

This paper will provide an update on student satisfaction in the SUNY Learning Network (SLN). We will look at the issue of student satisfaction from a variety of perspectives focusing on both the learning environment of SLN and on specific constructs and variables that may promote high levels of satisfaction. From a system perspective we will review the results of student surveys on a variety of issues impacting satisfaction. We interpret these results in light of the strategic objectives of the program and keeping in mind socio-cognitive views of instruction and well established principles of good practice in higher education. As with previous studies of student satisfaction in SLN, and in alignment with predictions from this theoretical framework, results indicate the importance of teacher-to-student and student-to-student interaction. More specifically, these results indicate the importance of both the quantity and quality of faculty-student interaction, of communicating clear expectations on how to succeed in courses and of providing timely, high quality feedback. These are the instructional variables that correlate most strongly with both satisfaction and learning. We also look at survey results that show correlations between the nature of SLN's asynchronous, text-based online learning environment and student's reported: depth of thought in discussions, ability to communicate effectively in writing, feelings of isolation, time on task, wasted time, and reported learning. We find good reason to believe that this environment engenders high levels of interaction, participation, satisfaction and learning.

In part two of this paper we will examine the nature of online interaction in greater depth by focusing on the impact of two elements of online communication - verbal immediacy and social presence. We present the results of research on social presence in an SLN course and examine a model that argues for the importance of creating opportunities and providing support for the development of online immediacy behaviors to sustain social presence (and by extension learning and satisfaction) among students participating in online courses.

B. Rationale

The SUNY Learning Network (SLN) is the on-line instructional program created for the sixty-four colleges and nearly 400,000 students of the State University of New York. The primary goals of the SUNY Learning Network are to bring SUNY's diverse, high-quality instructional programs within the reach of learners everywhere and to be the best provider of asynchronous instruction for learners in New York State and beyond.

Strategic objectives for this initiative are threefold:

1. to provide increased, flexible access to higher education within and beyond New York State;
2. to provide a mechanism for maintaining consistently, high quality online teaching and learning across the SUNY system; and
3. leverage the resources of the State University of New York system to contain the costs associated with the development, design, and delivery of online education.

C. Background Information for the Program

The SUNY Learning Network started as a regional project in the Mid-Hudson Valley involving eight SUNY campuses. Initially, the development and delivery of asynchronous courses was a new activity for SUNY campuses and faculty. With generous support from the Alfred P. Sloan Foundation combined with enthusiasm and resources from SUNY System Administration and participating campuses, SLN has evolved successfully through three stages 1) "proof of concept", 2) "proof of scalability", and 3) "proof of sustainability".

Successful experiences led to an expanded vision and goals for SLN and the scope and objectives of the project have grown substantially. The annual growth in courses, from eight in 1995-1996 to over 1500 in 2000-2001, and annual growth in enrollment, from 119 in 1995-1996 to more than 20,000 in 2000-2001, with courses offered at all undergraduate and graduate levels from fifty-three of our institutions, illustrates that the project has met and in many ways exceeded original projections.

D. Method

Technology and Infrastructure

Hardware and Software: Technical infrastructure is based on a redundant and highly available, multi-server, multi-location platform. Courses may include text, images, sound and multimedia appropriate to meet course learning objectives. Software, based on a flexible course template was locally developed in the Lotus/Domino Environment.

Content Delivery

Delivery of courses in SLN is asynchronous and instructor led. Students proceed through the course as a cohort. Faculty course designers participate in ongoing training which highlights the importance of interaction (among other instructional variables). Performance is assessed in many ways (discussion, essays, quizzes, tests, projects, portfolios etc.) and faculty are free to use asynchronous assessment methods that are consistent with their teaching. Occasionally faculty will choose to use proctored examinations (face-to-face meetings) making sure to accommodate students at a distance, by using local proctors.

Organization and Evolution

Courses are predominantly faculty developed and taught. Technical support is provided by a centralized SLN Helpdesk and both centralized and campus-based instructional designers. Support is available seven days a week and is widely utilized by both faculty and students.

Course development was initially supported centrally with both stipends and laptop computers used as incentives. In recent years, these material incentives have not been offered centrally and some campuses have begun to offer incentives. Courses have been offered a total of eighteen terms through SLN.

E. Results

In order to best focus our efforts on maintaining this learning environment we have engaged in systematic efforts to evaluate and analyze our online teaching and learning. As a standard part of our operation, every semester we conduct comprehensive surveys of all participating faculty and students through an integrated, web-based data collection infrastructure. To date we have collected data from more than 8000 student and faculty respondents.

How do students who have taken online courses through SLN feel about the experience? For example - is there sufficient interaction with instructors and students to sustain learning? From the students' perspective, how do some of the more than 1000 faculty participating in SLN rate in critical areas of instruction? Do they feel that there is sufficient interaction with other students, or sufficient assistance from academic support staff to attain their learning goals? Do students feel there are any disadvantages to the online format relative to the classroom? For example, does the online format foster or inhibit thoughtful discussion of course topics, effective written communication or the likelihood that they will ask for help when they don't understand something? Are there other downsides, for example do these online students find that they waste time due to the distractions of the Internet and thus spend less time studying, or does the online environment make them feel isolated? Finally, how do students feel the environment compares to the classroom overall?

To assess whether SLN has been successful from a student perspective it is necessary to remind ourselves what our "student" goals were. Some of these are outlined in the strategic objectives:

1. to provide increased, flexible access to higher education within and beyond New York State; and
2. to provide a mechanism for maintaining consistently high quality online teaching and learning across the SUNY system.

We tried to determine whether and to what extent we were achieving these goals through our online student satisfaction survey, which consisted of thirty-three questions. To define high quality teaching and learning in devising the survey, we used both socio-cognitive learning theory (Vygotsky, 1978; Brown, Collins, & Duguid, 1989; Lave, 1988; Bruner, 1990) and principles of good practices in higher education (Chickering & Gamson, 1987; Chickering & Ehrmann, 1995). Approximately one third of the questions we asked were based on the Current Student Inventory (CSI) developed by the Flashlight Program of the TLT Group. In the most recent survey (Summer 2001) we heard back from 935 students, about 26% of student enrollments for that period. We feel the results of the student satisfaction surveys provide some indicators of whether SLN is providing increased flexible access and whether it provides high quality, online teaching and learning, and that these indicators will prove useful to others working on systemic online learning initiatives.

Presented here are some very typical comments from the most recent survey of students in SLN which bear on the strategic goal of increased, flexible access and which indicate students' levels of satisfaction:

"Online courses have literally changed my life. Working fulltime I was unable to continue my college education due to schedule conflicts until the SUNY Learning Network. SLN has made it possible for me to realize a dream by finishing my college education!!!"

"This was my first online course; therefore it was a little awkward at first. My job responsibilities this semester required more travel than normal; taking this class online was a blessing. I worked from Florida and Texas while attending training for work."

"For people who have a less than traditional work schedule; an on-line course is the way to go. This being my first on-line course; it was a good experience; worked well into my daily schedule and I believe I learned more than I would have in the classroom setting. Once the stress of a traditional attendance schedule is removed; a much more relaxed atmosphere for learning is created by the ability to sign on and learn during the time frame that fits an individual schedule."

"I love online courses. They have given me the ability to juggle family; career and school. If it weren't for online courses; I would have never gone back to school....THANK YOU!!! :)"

Comments like these and many others like them, collected over the past six semesters testify to some measure of success and student satisfaction in this strategic area.

Another indicator of student satisfaction vis-à-vis increased access can be seen in the differing levels of student satisfaction by distance from their institution. In semester surveys of SLN students in which we ask students about their level of satisfaction with the SLN program we consistently find significantly higher levels of satisfaction from those farthest from campus. It can reasonably be expected that these are the students least likely to have traditional access to the education afforded by SLN. Higher levels of satisfaction are also found among students who report that they are taking courses due to family and personal conflicts which keep them from going to a physical campus, which, again, represent constraints on access. The tables below, based on the most recent sample of 935 SLN students, studying in the Summer of 2001, suggest the importance of increased access on student satisfaction. The scores are based on a likert-type scale with 1 being highly satisfied and 5 being highly dissatisfied and are in response to the questions "How satisfied are you with the SUNY Learning Network?" and "Why did you decide to take this course online rather than in the classroom?"

Table 1. Satisfaction with the SLN Program by Distance from Campus

DISTANCE	Mean	N	Std. Deviation
On campus	2.09	11	.70
Less than 30 minutes	1.53	389	.66
30 minutes to 1 hour	1.59	214	.68
1 hour - 2 hours	1.57	112	.74
More than 2 hours	1.43	209	.59
Total	1.53	935	.66

Table 2. ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Satisfaction by Distance	Between Groups	(Combined)	6.566	4	1.642	3.796	.005
	Within Groups		402.123	930	.432		
	Total		408.689	934			

Table 3. Satisfaction with SUNY Learning Network by Distance

Why Online?	Mean	N	Std. Deviation
Distance or lack of transportation	1.45	128	.59
Conflict with personal schedule	1.50	373	.62
course not offered on campus	1.74	122	.69
family responsibilities	1.38	185	.62
interest in technology/internet	1.78	40	.95
Other	1.71	87	.71
Total	1.53	935	.66

Table 4. ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Satisfaction with SLN by Reason	Between Groups	(Combined)	15.572	5	3.114	7.360	.000
	Within Groups		393.117	929	.423		
	Total		408.689	934			

This data suggest that students do report higher satisfaction due to increased access. Students who are least able to access the courses due either to distance or to other responsibilities report significantly higher levels of satisfaction with the program.

High Quality Online Teaching and Learning

To discuss the other strategic goal for SLN - to provide a mechanism for maintaining consistently, high quality online teaching and learning across the SUNY system, requires that we define what we mean by "quality". Again we used socio-cognitive learning theory and principles of good practice in higher education to define and assure quality in the development, implementation and evolution of course design and faculty development in SLN. In brief, for our purposes, socio-cognitive learning theory suggests the importance of interaction and active learning and is the basis for many of the good practices in instruction at all levels. The principles of good practice are presented below, followed by survey results related to each principle.

A) Good Practice Encourages Contacts Between Students and Faculty

"Being a shy person I am able to think questions and answers through before I respond. In a regular classroom setting I often don't get my question out before we are on to another topic. I really like the online classes. I wish I could complete my degree online..." (Survey comment)

It has been suggested that information technologies, "...can increase opportunities for students and faculty to converse" (Chickering & Ehrmann, 1995) and that such conversation is critical to learning and satisfaction. So, we asked students whether they had high levels of interaction with their instructors and other students and about the quality of the interaction. Overall more than 75% of students reported high levels of interaction with their instructors and approximately 73% felt they had high levels of interaction with their online classmates. Additionally, approximately 78% of respondents felt that the quality of the interaction with their instructors was very high and approximately 70% felt the quality of interaction with fellow students was very high. When asked to compare the level of interaction to similar classroom based courses a majority felt there was as much or more interaction with their instructor and fellow students as in similar classroom based courses.

Socio-cognitive principles would predict that the amount and quality of interaction will relate to satisfaction and learning, and our results demonstrate that they do. The tables below show the correlations between students reports of the quantity and quality of interaction with faculty and with other students and their reports of satisfaction and learning in SLN courses.

Table 5. Correlations between Interaction, Satisfaction, and Learning

		Interaction with Instructor	Quality of Instructor Interaction	Interaction with Fellow Students	Quality of Interaction with Fellow Students
Satisfaction	Pearson Correlation	.631**	.672**	.367**	.401**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	935	935	935	935
Reported Learning	Pearson Correlation	.619**	.631**	.376**	.394**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	935	935	935	935

** Correlation is significant at the 0.01 level (2-tailed).

B) Good Practice Uses Active Learning Techniques

"This was a good experience for me. This course made me do a lot of deep thinking and allowed me to further my education. I cherish the fact that I can learn at this stage of my life. Thanks very much for offering this course." (Survey comment)

"I have to tell you that I read the chapters more carefully as it was my responsibility to learn the subject matter. This course has helped me with my concentration skills. I was surprised how much I enjoyed the course. It was a real challenge to me and I love a challenge." (Survey comment)

Meaningful learning requires active student engagement. How well do traditional classroom practices do at actively engaging students? Frequently, not very well. Barnes (1980) found that, even among faculty who actively solicited student participation, students only responded 50% of the time when called upon. Karp and Yoels (1988) reported that in classes of less than 40, four to five students accounted for 75% of all interactions and that in classes of more than 40, 2-3

students accounted for more than half of all interactions. Stones (1970) in a survey of over 1000 students found that 60% stated that a large number of classmates listening would deter them from asking questions, even when encouraged to do so by the instructor.

In contrast, in the most recent SLN survey, 93.4% of students reported active participation in their online class. To get a sense of how active and in what sense the students engaged in active learning we asked them to compare their levels of participation in online discussions about course material with comparable classroom discussions. We found that students were about *twice* as likely to report active participation in online discussion than in classroom-based discussions. Students also reported that they were about *twice* as likely to ask for clarification when they did not understand something online than in the classroom. One side benefit, due to the fact that all of this communication occurred through written means - about 83% felt that the online format helped them improve their ability to communicate effectively in writing.

It has been suggested that information technologies allow student and faculty to converse, "...more thoughtfully and safely than when confronting each other in a classroom or faculty office (Chickering & Ehrmann, 1995)" and that this increased comfort and level of thought contributes to learning and satisfaction. We asked students to compare the amount of thought they put into their online discussion comments with those they made in the classroom. We found that about 86% of respondents reported that they put *more* thought into online discussion comments than into comparable classroom discussion, providing support for this hypothesis. As would be predicted, a significant correlation exists between amount of thought invested in discussion responses, and learning and satisfaction.

Table 6. Correlation Between Thought in Discussion Comments, Satisfaction and Learning

		Satisfaction	Reported Learning
Discussion Thought	Pearson Correlation	.262**	.272**
	Sig. (2-tailed)	.000	.000
	N	935	935

** Correlation is significant at the 0.01 level (2-tailed).

To confirm whether online conversations did occur "more safely" i.e. with more opportunity to explore topics that might be difficult to explore face-to-face, we asked students how likely they were to ask an awkward question online as compared to the classroom and whether they were more likely to ask for clarification online than in the classroom. Approximately 69% reported they were more likely to feel comfortable asking an awkward question online. Approximately 40% reported that were more likely to ask for clarification online, which was about twice the rate of those reporting that they were more likely to ask for clarification in the classroom (18%).

Authentic interaction implies that student-participants feel empowered to disagree, not only with each other, but also with the instructor. When asked whether they felt more comfortable disagreeing with the instructor in the online classroom, a large number of students (42%) reported that they did feel more comfortable in this environment.

C) Good Practice Gives Prompt Feedback and Communicates High Expectations

"I absolutely love this class. (The Professor) expects a lot but it's all so clear and interesting that it actually is fun. I've learned so much! I wish more classes were on-line." (Survey comment)

"I enjoyed this class because the teacher was helpful; she was prompt with answering questions and grading assignments. The teacher was very clear with what she wanted the class to do." (Survey comment)

"What I've appreciated most about this course has been the instant feedback and evaluations; critiques etc. from my professor. It's helped to keep me motivated and striving for better each week of the class. This has been a fantastic experience!" (Survey comment)

"There was very prompt response to discussion threads and test and assignment evaluations. Responses to comments were made within a day in most cases. This encouraged students to discuss with the instructor and other students on a regular basis. It felt like the course was alive; and help was there when you needed it." (Survey comment)

We asked students about the speed and quality of the feedback they received in their online courses. Approximately 85% reported that they received very prompt feedback and about 87% felt that they had received high quality, constructive feedback. Additionally more than 90% reported that the instructor provided clear expectations of how students could succeed in the course. As demonstrated in the table below each of these variables correlates significantly with reports of satisfaction and learning.

Table 6. Correlations Between Satisfaction, Learning, Expectations and Feedback

		Prompt Feedback	Quality Feedback	Clear Expectations
Satisfaction	Pearson Correlation	.592**	.620**	.609**
	Sig. (2-tailed)	.000	.000	.000
	N	935	935	935
Learning	Pearson Correlation	.520**	.569**	.563**
	Sig. (2-tailed)	.000	.000	.000
	N	935	935	935

** Correlation is significant at the 0.01 level (2-tailed).

D) Good Practice Emphasizes Time on Task

"I have learned more from this course than any other graduate course I have taken. There was a lot of work involved; but it only enhanced my understanding of lessons taught and has improved my teaching abilities in the classroom. I have; and will continue to recommend this system to fellow teachers who are trying to obtain a graduate degree. Thank You!!! " (Survey comment)

"I love the learning experiences gained from the online courses. I find that I actually work harder because generally it does take more time and effort to complete the online courses. With

this in mind; the time used is very valuable and adds more meaning and depth to the overall learning experience." (Survey comment)

We asked students to think about the format of their courses and the fact that there was "anytime-anywhere" access. Did they feel that this increased level of access resulted in more time studying? Approximately 71% of students reported that they did spend more time studying as a result of the increased access afforded by the online format.

Table 7. Correlation Between Amount of Time Spent Studying, Learning, and Satisfaction

		Satisfaction	Learning
Time	Pearson Correlation	.265**	.294**
	Sig. (2-tailed)	.000	.000
	N	935	935

** Correlation is significant at the 0.01 level (2-tailed).

However, the possibility for wasting time in online courses, due to the distractions of the Internet is also possible. Approximately 13% of students did report that the online format resulted in more wasted time browsing and about 87% did not.

Wasting time can take other forms. For example, technical difficulties can consume time that would otherwise be devoted to more productive purposes. So we asked students about technical difficulties and their effect on the students learning and satisfaction. Approximately 88% of students felt that taking a course through SLN was no more technically difficult than taking a classroom based course. We also found that students who were less likely to report technical difficulties were more likely to report higher levels of satisfaction and learning and that students were highly satisfied with the SLN Helpdesk.

E) General Results

Overall approximately 87% of SLN students reported being satisfied or very satisfied with their courses; about 90% report learning a great deal; about 94% reported being satisfied or very satisfied with SLN services; and 97% reported satisfaction with the SLN Helpdesk. When asked whether they would take another SLN course, only 1.7% responded that they would definitely not want to do this. Finally, overall, these 935 students were 1.7 times as likely to report learning more in their online courses (36%) than in comparable classroom-based courses (20.8%), though the majority felt they were equivalent (43.2%).

Importance or Relevance to Other Institutions

Are these findings relevant to other institutions? We believe they are useful in a number of ways. Online learning environments are not easy to implement successfully. Effort, coordination, planning and expense is required. If an institution is considering systematic implementation of online education it is useful to know that success, as measured by traditional notions of best practice in higher education, is possible.

In general, although we acknowledge that these results may not be completely generalizable to other systems, to know that nearly 1000 students from 53 institutions from associate level through

graduate level programs reported high levels of learning and satisfaction in online courses, offered through a single, unified system, is potentially helpful. We feel the success of SLN demonstrates that it is possible to overcome the complexity and challenges involved in system-wide online learning initiatives, to provide increased flexible access, and to maintain high standards across courses.

For those who are concerned that the online learning is, by its very nature, cold, sterile, and isolating, knowing that the vast majority of these online students reported high levels and high quality interaction with their instructors and other students, and that they were unlikely to report feeling isolated, is potentially helpful. Knowing that the vast majority reported fast and high quality feedback as well as clear expectations for success is also encouraging.

Through correlational research we have found that a number of variables correlate significantly with high levels of satisfaction and learning. Before embarking on the implementation of new online learning environments it would be wise to consider the following: high levels of interaction with the instructor, and the quality of that interaction, interaction with fellow students and its quality, prompt and high quality feedback on assignments, clear expectations on how to succeed in the course and low levels of technical difficulties are all variables that correlate highly with both satisfaction and learning and, therefore need to be given a high priority in planning and developing an online environment. Perhaps not surprisingly, these are also variables that correlate highly with satisfaction and learning in the classroom.

Is ALN "as good as" the classroom?

For those who are concerned about whether the online environment is "as good as" the classroom it is useful to know that it is, at least, possible to attain many measures of equivalence. We see reason for optimism in the knowledge that in the most recent term for which data was collected, nearly 1000 online students from dozens of institutions not only reported high levels of satisfaction and learning, but were also: twice as likely to report active participation in such important activities as discussion of course materials; twice as likely to report asking instructors for clarification; twice as likely to report putting more thought into discussion; twice as likely to report spending more time studying; and nearly twice as likely to report learning more online than in the classroom. We also found that students who had taken four or more classes were no less likely to report high levels of satisfaction and learning in these courses than student who were taking their first course. These results replicate findings from five previous surveys in the period 1998-2001.

PART II

The next section looks at the development of verbal immediacy and social presence in asynchronous online course discussion, examining more deeply how that critical variable, interaction, is manifest in online learning. This section provides insight into the notion of interaction and builds upon consistent findings in research of the SUNY Learning Network - the factors that accounts for the most variance in students reports of learning and satisfaction is the quantity and quality of their interaction.

Introduction

This section will explore the notion of social presence in computer-mediated communication and its relationship to the concept of verbal immediacy in research on face-to-face teaching and

learning. It describes a study which looked at the affective, interactive, and cohesive verbal immediacy behaviors of students participating in online discussions in an asynchronous graduate course in education. It posits an equilibrium model of the development of social presence in online course discussions and argues that course developers and instructors should create opportunities and provide support for the development of social presence among students participating in online courses.

Perspectives/Theoretical Framework

This section and the study on which it reports are grounded in theories of, and research on, immediacy behaviors in face-to-face teaching and learning, social presence in mediated communication, and online learning communities.

“Immediacy” refers to the “psychological distance between communicators” (Weiner & Mehrabian, 1968). Educational researchers have found that teachers’ verbal (i.e., giving praise, soliciting viewpoints, humor, self-disclosure) and non-verbal (i.e., physical proximity, touch, eye-contact, facial expressions, gestures) immediacy behaviors can lessen the psychological distance between themselves and their students, leading (directly or indirectly depending on the study) to greater learning (Plax & Wendt-Wasco, 1985; Kelley & Gorham, 1988; Gorham, 1988; Christophel, 1990; Rodriguez, Plax & Kearney, 1996).

Communication researchers have extrapolated from this research to argue that differing media have differing capabilities to transmit the non-verbal and vocal cues of face-to-face communication. Short, Williams & Christie (1976) refer to these capabilities as “social presence,” or the “quality of a medium to project the salience of others in interpersonal communication,” and contend that media with few affective communication channels, such as text-based computer-mediated communication, have less social presence (*and by extension promote less learning*) than media with a greater number of affective communication channels, such as two-way video.

Other researchers experienced with online teaching and learning, however, contest this view, arguing that rather than being impersonal, CMC often seems to be what Walther (1994) calls “hyper-personal,” that participants in computer-media communications create social presence by projecting their identities and building online communities through verbal immediacy behaviors (Gunawardena & Zittle, 1997; Poole, 2000; Rourke, Anderson, Garrison & Archer, 2001). The research reported in this chapter was designed to test this latter view.

Methodology

In order to examine the verbal immediacy/social presence behaviors of students participating in online course discussions, a coding schema was developed based on research in both classroom-based immediacy and social presence in computer-mediated communication, and on indicators emerging from the data. Three categories of indicators were identified:

Affective indicators (Figure 1) are personal expressions of emotion, feelings, beliefs, values (paralanguage, emotion, value, humor, and self-disclosure) which suggest personal social presence.

paralanguage (PL)	features of text outside formal syntax used to convey emotion (ie. emoticons, punctuation, capitalization, etc.)	<i>Someday; How awful for you :- (; Mathcad is definitely NOT stand alone software; Absolutely!!!!!!</i>	Bussman, 1998; Rourke et al, 2001; Poole, 2000
emotion (EM)	use of descriptive words that indicate feelings (ie., love, hate, sad, silly, etc.)	<i>When I make a spelling mistake, I look and feel stupid; I get chills when I think of. . .</i>	Rourke, et al, 2001
value (VL)	expressing personal values beliefs, & attitudes	<i>I think that commercialization is a necessary evil; I feel our children have the same rights</i>	emergent
humor (H)	use of humor – teasing, cajoling, understatement, irony, sarcasm	<i>God forbid leaving your house to go to the library; Now it is like brushing my teeth (which I assure you I do quite well)</i>	Eggins & Slade, 1997; Rourke et. al, 2001
self-disclosure (SD)	sharing personal information, expressing vulnerability	<i>I sound like an old lady; I am a closet writer; We had a similar problem. . .</i>	Cutler, 1995; Rourke et al, 1999; Poole, 2000

Figure 1. Affective Indicators

Interactive indicators (Figure 2) provide evidence that the other is attending (acknowledgement, agreement, approval, invitation, and personal advice) which suggest interpersonal social presence.

acknowledgement (AK)	referring directly to the contents of others' messages; quoting from others' messages	<i>Those old machines sure were something!; I agree that it is the quickest way; I also agree that software can make or break a computer</i>	Rourke, et al, 2001
agreement/ disagreement (AG)	expressing agreement or disagreement with others' messages	<i>I'm with you on that; I agree; I think what you are saying is absolutely right</i>	Rourke, et al, 2001; Poole, 2000
approval (AP)	expressing approval, offering praise, reinforcement, encouragement	<i>You make a good point; Good luck as you continue to learn; Right on!</i>	Rourke, et al, 2001
invitation (I)	asking questions or otherwise inviting response	<i>Any suggestions?; How old are your students?; Would you describe that for me, I'm unfamiliar with the term</i>	Rourke, et al., 2001
personal advice (PA)	offering specific advice to classmates	<i>Also the CEC website might have some references; I would be happy to forward them</i>	emergent

Figure 2. Interactive Indicators

Cohesive indicators (Figure 3) behaviors that build and sustain a sense of group commitment (greetings and salutations, vocatives, group reference, social sharing, and course reference) which suggest group social presence.

greetings & salutations (GS)	greetings, closures	<i>Hi Mary; That's it for now, Tom</i>	Rourke, et al, 2001; Poole, 2000
vocatives (V)	addressing classmates by name	<i>You know, Tamara. . . ; I totally agree with you Katherine</i>	Christenson & Menzel, 1998; Sanders & Wiseman, 1990; Rourke, et al 2001; Poole, 2000
group reference (GR)	referring to the group as <i>we, us, our</i>	<i>We need to be educated; Our use of the Internet may not be free</i>	Rourke, et al, 2001
social sharing (SS)	phatics, sharing information unrelated to the course	<i>Happy Birthday!! to both of you!!!</i>	Rourke, et al, 2001
COURSE reflection (RF)	reflection on the course itself	<i>A good example was the CD-ROM we read about</i>	emergent

Figure 3. Cohesive Indicators

Hardcopy transcriptions of online discussions (in which participant names were replaced with IDs to preserve subject anonymity) were coded by multiple researchers for each of these 15 indicators as well as for the number of words per posting, the number of postings per discussion thread, and the depth of each discussion thread. Participant names were replaced with IDs to preserve subject anonymity. Discrepancies between coders were resolved by consensus and reference to the transcripts.

Data analyses consisted of compiling and reviewing raw numbers of indicators across modules (time) and the reviewing of the discussion transcripts for patterns of indicator use and emergent themes.

Data Sources

Data was collected from the discussions that took place in a graduate level course in Educational Computing at the University of Albany, given entirely online through the SUNY Learning Network in the Spring, 2001 semester. The course consists of four modules that run sequentially across the semester. In each module, there are three discussions initiated by instructor questions and roughly corresponding to the three weeks students are directed to spend working in each module. Students are required to submit one response to the instructor's prompt and two responses to their classmates' comments or questions in each discussion. They may, of course, submit as many responses as they like.

Data collected consisted of all discussion strands from the first discussion in each module initiated in the first five days each module was open. The total number of postings examined was

235 responses in 39 discussion threads, or approximately 10% of all postings in the course discussions. The average number of words per posting was 82.4 (range = 5 to 562; the average number of responses per thread was 6.05 (range = 0 to 30); and the average depth (interactivity measured as the depth of a threaded discussion) was 3.63 (range = 1 to 10).

Students participating in the course ranged in age from 23 to 48 and were about 2/3 female. The majority were practicing K-12 teachers, but course participants also included post-secondary educators and library and educational technology specialists.

Results/Conclusions

We found a great many immediacy/social presence indicators in the online discussions we reviewed, a total of 1336 (663 affective, 468, interactive, and 235 cohesive) in 235 postings, or an average of almost 6 indicators per posting. Only one posting had no immediacy indicators in it and that message was not responded to. We believe these findings provide evidence that participants in computer-mediated communications make up for the lack of affective communication channels by employing more immediacy behaviors in those channels that are available to them. A closer look at the data supports this notion as well.

For example, the most frequently used indicator (254 instances) was paralanguage, the use of text outside formal syntax to convey emotion or emphasis (i.e., emoticons, punctuation, capitalization, etc.). It seems reasonable to assume that this is because discussion participants were using paralanguage to take the place of gestures, facial expressions, and aural cues in their conversation. The second most frequently used indicator (228 instances) was acknowledgement. Acknowledgment involves referring directly to and/or quoting from the contents of others' messages; quoting from others' messages. Acknowledgement might be best understood as the text-based equivalent of looking at the person you are talking to. It seems to be used to keep discussion threads going. It is interesting to note that while the use of paralanguage (indeed all affective indicators) peaked in the third module of the course and declined precipitously in the fourth and final module, the use of acknowledgement continued to grow across modules.

Other interesting findings include:

- Self-disclosure, the sharing of personal information and/or the expression of vulnerability, was the third most frequently employed indicator (223 instances). It seems to be a way of presenting oneself as painfully human and so lessening the psychological distance between participants. Indeed self-disclosure seemed to evoke the greatest number and depth of response from other participants. Like paralanguage, it's affective cousin, its use peaked in the third module and dropped off in the fourth.
- Cohesive indicators were used widely in the first two modules and then dropped off a good deal in the last two modules. Cohesive indicators seem to be a way of creating a sense of a group, thus it may be that once students formed a learning community, they were no longer needed. Indeed, the most widely used cohesive indicator, group reference, dropped off a great deal in the final modules. Interestingly, as the use of group reference decreased, the use of vocatives (personal reference) and reflection on the course itself increased.
- The use of humor was extremely rare, perhaps because many forms of humor are easily misinterpreted in text-based communication. Indeed there were no instances

of humor in the first module though it seemed to grow as participants became more comfortable with each other.

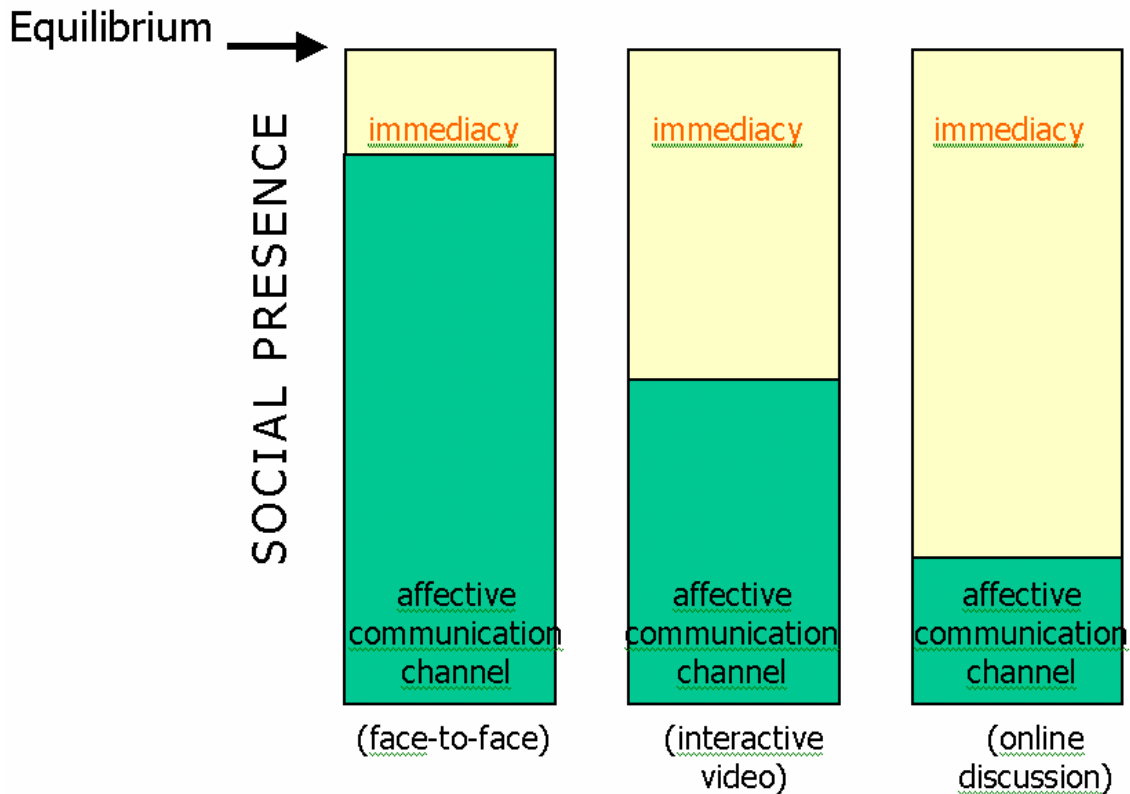


Figure 4. Equilibrium Model

What all these findings lead us to conclude is that students participating in online course discussions strive to create a community of learning by employing text-based, verbal immediacy behaviors to reduce the psychological distance amongst themselves. This leads us to posit an equilibrium model of social presence (Figure 4) which suggests that social presence is actually a factor of both the affective communication channels available in a medium and the immediacy behaviors of the participating communicators. We further argue that communicators will employ more immediacy behaviors when there are less affective channels available to reach a kind of social presence equilibrium with which they are comfortable. It may be possible that this social-presence equilibrium supports learning.

Educational Significance

The research on teachers' immediacy behaviors in face-to-face classrooms shows links between these behaviors and students' learning. Although some scholars have argued that the lack of affective communication channels in computer-mediated communication leads to a loss of immediacy and a corresponding loss in learning, more recent research suggests otherwise. This study supports the latter research but tries to incorporate findings from the former by suggesting that participants in online discussions make up for the lack of affective communication channels by engaging in a greater number of verbal immediacy behaviors. It posits an equilibrium model

of social presence to describe this view. This model has practical implications for the development and implementation of online courses and for online learning in general, in that it suggests that developers and instructors of online courses should seek designs and strategies that support the growth of social presence and participants' development of learning communities.

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