FUTURE FOREIGN LANGUAGE TEACHERS' SOCIAL AND COGNITIVE COLLABORATION IN AN ONLINE ENVIRONMENT

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ABSTRACT

Discussion boards provide an interactive venue where new and future language teachers can reflect, evaluate, solve problems or simply exchange ideas (e.g., Bonk, Hansen, Grabner-Hagen, Lazar, & Mirabelli, 1996; DeWert, Babinski, & Jones, 2003; Kumari, 2001; Pawan, Paulus, Yalcin, & Chang, 2003). In addition, encouraging future teachers to *learn* with technology before *teaching* with it allows them to become comfortable using various computer applications.

This article examines transcripts from a semester-long asynchronous discussion between foreign language methodology classes at two different universities. Social and cognitive presence in the discussions was analyzed using Garrison, Anderson, and Archer's Framework of a Community of Inquiry (2001). The results indicate that students engaged in a high degree of interactivity as well as all types of social and cognitive presence. These findings indicate that students not only progressed in their cognitive understanding of the pedagogical topics, but also employed social presence, the more dominant of the two, to aid their discussions. The topics seemed to play an important role in the type of cognitive activity evident in the discussions.

These results differ from those of studies which found that students did not engage in interactivity (Henri, 1995; Pena-Shaff & Nicholls, 2004) and others which noted low levels of social presence (Garrison, et al. 2001; Meyer, 2003).

INTRODUCTION

Preparing future foreign language (FL) teachers for their careers is a complex process which requires reflection, opportunities to apply theory to real-life situations, and a network for the exchange of ideas and support. To promote this professional growth, a variety of tasks have been incorporated into teacher training courses and programs. The purpose of this study is to add to the growing body of research on ways to integrate technology in teacher education programs by examining discussion boards, a form of asynchronous computer-mediated communication (ACMC), and their potential to promote social interaction and cognitive growth among new and future teachers.

There are two reasons why technology should be an integral part of teacher training. First, many computer applications, especially asynchronous computer-mediated communication (e.g., e-mail, electronic bulletin boards), promote interactive learning, which is central to the professional development of future and current educators. Electronic discussion boards provide an interactive venue where new and future teachers can reflect, evaluate, solve problems or simply exchange ideas (Bonk et al., 1996; DeWert et al., 2003; Kumari, 2001; Liou, 2001; Mitchell, 2003; Pawan et al., 2003). Through such collective online discussions, future teachers experience the cognitive and social benefits of collaborating with their peers, which is the focus of this article.

In addition to providing opportunities for dialogue, technology has become an integral part of learning and teaching. This was reflected in President Clinton's *America's Technology Literacy Challenge* (1996),

when he demanded that teachers receive the necessary training and support to use computers in their classrooms. When future teachers *learn* with technology before *teaching* with it, they are able to experience technology from the students' point of view and thereby evaluate its uses and benefits from a user perspective. This is an important step in preparing teachers for the effective use of educational technology (Kassen & Higgins, 1997). As a result, these teachers are more likely to incorporate technology into their own teaching (Lam, 2000).

LITERATURE REVIEW

Collaborative Learning

Computer-mediated communication (CMC) is a widely used educational tool because it lends itself to instruction based on sociocultural principles. It has been suggested by Vygotsky (1978) and explored by many researchers (Adair-Hauck & Donato, 1994; Aljaafreh & Lantolf, 1994; Anton & DiCamilla, 1998; Coughlin & Duff, 1996; Warschauer, 1997, 2000) that learning takes place in a social environment and is facilitated by dialogue. During this exchange of ideas, each individual interlocutor is able to internalize the new jointly constructed knowledge. Learning is therefore mediated by the context in which it takes place, the tools used to aid the learning process, such as dialogue, books, electronic messages, and Web pages, as well as by the participants involved in the learning process (Bonk & Cunningham, 1998).

This collaborative learning process is often facilitated by scaffolding, when interlocutors provide prompts, hints, explanations, questions, and suggestions to assist each other in solving the current problems (Bonk & Cunningham, 1998; Donato, 1996). Collaborative learning tasks encourage learner autonomy (Henri & Rigault, 1996), build teamwork, alter the role of teachers and students, allow students to scaffold, facilitate class discussion, and promote critical thinking (Bonk & King, 1998). When students scaffold each other, they can ultimately reach higher-level understandings of tasks or solve problems they would have been unable to solve alone. When done through writing instead of speaking, as is the case in CMC, the writing process changes from an independently performed task to one that promotes use of the input and reflection of other students.

Computer-mediated Communication

CMC has been used in a wide variety of contexts to replace or supplement face-to-face communication. In schools, colleges and universities across the world, teachers have used electronic exchanges, e-mail, bulletin boards (ACMC) and real-time chats (synchronous CMC), in a variety of disciplines such as communication (e.g., Pena-Shaff & Nicholls, 2004), medicine (e.g., Koschmann, Kelson, Feltovich, & Barrows, 1996) and foreign languages (e.g., Abrams, 2001, 2003; Lee, 2002). CMC has also been implemented in teacher training and education courses in a variety of ways, for example, to discuss teaching scenarios (Bonk et al., 1996), engage students in discussions with experts (Lomicka & Lord, 2004), reflect on teaching experiences and observations (Liou, 2001), collaborate and provide feedback on group projects (Curtis & Lawson, 2001), and for group problem-solving (Kang, 1996).

Why use ACMC?

The fact that many educators see CMC as a valuable type of educational technology is partly due to certain inherent features of the medium, which affect and shape participants' interaction. Especially ACMC, used in the current study, provides a time lag between reading a posting, formulating a reply, revising it, and finally sending it. This lack of time pressure allows more time for reflection (Duffy, Dueber, & Hawley, 1996; Garrison, Anderson, & Archer, 2001; Meyer, 2003), which is often lacking in the dynamic and fast-paced discussions typical of classrooms. Since ACMC is time and space independent, it is also a convenient way to connect people who otherwise would not be able to meet. This has given educators the opportunity to expand their classrooms to include a virtual space, where their

students can meet experts (Kumari, 2001; Lomicka & Lord, 2004) or other students, as is the case for this study.

Of course, ACMC also has certain disadvantages. But as Salaberry (2000) pointed out, an apparent drawback of technology can sometimes be used as a pedagogical advantage. The fact that ACMC does not provide participants with immediate feedback from their peers and/or teacher can be perceived as a disadvantage of ACMC. However, this encourages the interlocutors to compose clear, succinct messages to convey meaning (Koschmann et al., 1996; Meyer, 2003). As is the case for many written forms of expression, making a record of one's thinking is more powerful and intentional than is usually possible in spoken communication (Wells & Chang-Wells, 1992).

There have been many reports of successful implementations of ACMC, with different cognitive benefits. E-mail exchanges or discussion boards often include lively information exchanges (Kanuka & Anderson, 1996; Pawan et al., 2003), which display in-depth processing (McKenzie & Murphy, 2000) and critical thinking (Liou, 2001; Newman, Johnson, Cochrane, & Webb, 1996; Newman, Webb, & Cochrane, 1995). Reading others' comments, ideas and experiences also exposes students to multiple perspectives (DeWert et al., 2003; Mitchell, 2003) and helps to broaden students' knowledge and deepen their understanding (Gunawardena, Lowe, & Anderson, 1997; Kanuka & Anderson, 1996; Mitchell, 2003). In addition, the opportunity to build on each other's ideas (Pawan et al., 2003) and to learn from each other (Sengupta, 2001) can result in the co-construction of knowledge (Kamhi-Stein, 2000; Pena-Shaff & Nicholls, 2004; Sengupta, 2001), as mentioned above in regard to collaborative learning and scaffolding.

Apart from the cognitive benefits described above, students and teachers alike have witnessed the positive social impact ACMC can have. Asynchronous electronic exchanges seem to foster the building of a learning community, where participants offer each other support and praise (Cole, Raffier, Rogan, & Schleicher, 1998; McKenzie & Murphy, 2000; Sengupta, 2001). Although it has been argued that the lack of social context cues such as frowning, smiling or nodding makes ACMC a reduced register (Ferrara, Brunner, & Whittemore, 1991), these fewer social cues often lead to greater equality in participation than in the traditional classroom (Kang, 1996; Warschauer, 1997) further contributing to the social network of the ACMC community.

This body of findings illustrates how "CMC creates the opportunity for a group of people to construct knowledge together, thus linking reflection and interaction" (Warschauer, 1997, p. 473). Therefore, it seems to be a good fit for promoting the type of student-centered learning that is central to the sociocultural theory of learning and teacher education.

Inconclusive Research Findings

While there have been many studies reporting on the cognitive and social benefits of ACMC, this research is far from conclusive. In fact, there are studies whose findings contradict the positive accounts of ACMC implementations just described. Some have reported that in ACMC participants rarely explain or elaborate on their own contributions or challenge an opinion (Curtis & Lawson, 2001; Kanuka & Anderson, 1996; Pawan et al., 2003). Sometimes ACMC discussions tend to consist of mostly independent messages making them "one-way" interactions (Pawan et al., 2003, p. 129). Consequently, this lack of interactivity hinders the co-construction of meaning (Henri, 1995), the negotiation of meaning (Kanuka & Anderson, 1996), or even advanced cognitive processes (Weasenforth, Biesenbach-Lucas, & Meloni, 2002).

These inconsistent findings might be due to differences in *how* exactly ACMC was implemented, such as how it was integrated into a course, methods of assessment, task type, teacher involvement in the discussions, group composition and dynamics, and time allotted for the discussion. As Warschauer, Turbee, and Roberts (1996, p. 9) point out, "the appropriate and effective use of computer networks … is partly a technical issue, but primarily a pedagogical one.". This suggests that the decisions we as teachers

make about how to use ACMC (e.g., group size, task) play an important role in determining the outcomes of that activity. In addition, such inconsistent findings on the quality of learning through ACMC might be due to the different theories and frameworks researchers have used to analyze the transcripts of ACMC exchanges.

Analyzing ACMC Discussions

To analyze ACMC discussions, researchers have used various focuses and types of data. When investigating ACMC, one important aspect is the participants' perceptions of the value and benefits of such activities. For this purpose, researchers have used questionnaires (Mazzolini & Maddison, 2003), interviews (Lam, 2000; Macdonald, 2003) and think-aloud protocols (Schallert, Reed, & the D-Team, 2003). To investigate the actual discussions, the readily available transcripts have often been used for analyses. Earlier research especially tended to focus on those aspects of online communication that were easily measured and quantifiable (Kern, Ware, & Warschauer, 2004), such as the number of postings, threads or logons, the length of entries, and patterns of turn taking. But these quantitative indicators provide an incomplete picture, since they do not account for the messages' content. Already in 1992, Mason warned that this type of analysis is problematic because student *activity* might be mistaken for student *learning*. To overcome this flaw, there has been a shift in recent years to focus on the quality of production and learning. This has allowed researchers to investigate whether ACMC's promise to promote effective learning remains potential or is a reality. Such studies have included descriptive accounts of the discussions (Cole et al., 1998; Kamhi-Stein, 2000; Matsuda & Matsuda, 2001) or relied on content analysis frameworks based on current trends in education (e.g., critical thinking, collaborative/cooperative learning, learner-centered learning, co-construction of knowledge) (Kanuka & Anderson, 1996; Meyer, 2004; Newman et al., 1996; Newman et al., 1995; Pawan et al., 2003; Sengupta, 2001).

Theoretical Framework

In order to select the most appropriate framework for this study, it was necessary to evaluate several analysis frameworks. As shown by Meyer (2004), who analyzed online discussions using four different frameworks (among them Bloom's taxonomy (Bloom & Krathwohl, 1956) and Garrison et al.(2001)) and compared the results, there is not one best framework for analyzing ACMC. The choice of framework depends on the type of discussion and the learning objectives, since each framework focuses on a different aspect of student involvement in the discussion and how the student expresses his/her thought process in the postings.

Because this study was concerned with examining higher-level thinking and social aspects of CMC, the frameworks that dealt with reflection and critical thinking were most relevant to the current analysis. Although various frameworks have been employed to investigate cognitive processes (e.g., Mitchell, 2003; Sengupta, 2001; Weasenforth et al., 2002), the framework developed by Garrison et al. (2001) was used for this study because: (1) it is specifically designed to analyze online interactions, (2) it is the most widely used framework for ACMC analyses (Garrison et al., 2001; Meyer, 2004; Newman et al., 1996; Newman et al., 1995; Pawan et al., 2003), and (3) it includes categories for analyzing social presence within the dialogue, a necessary component for negotiating meaning and co-constructing knowledge according to Garrison et al. (2001).

METHODOLOGY

Participants

This study was conducted in the fall semester of 2003 with two graduate level courses, one taught at University One (U1) and the other at University Two (U2). Both were mandatory three-credit-hour classes on foreign language teaching methodology designed for incoming graduate teaching assistants

(TAs). With three hours a week of traditional instruction as well as online discussions, these classes extended from the classroom into an online environment. While the U1 course was specifically for German TAs, the class at U2 was offered through the foreign language department for future TAs in the French, German, and Spanish programs.

At U1, five female graduate students participated in the discussions. Since all of them were natives of Germany, they had to conduct the electronic discussions in a language other than their native language (i.e. English). All except for one student had just arrived from Germany and began teaching first semester German classes right away.

From the U2 course, 18 students participated in this study, 5 males and 13 females. Three of them were undergraduate students, who had obtained special permission to receive undergraduate credit for the class. The other 15 participants were graduate students. The U2 students represented quite a heterogeneous group from the French program (5 students), German program (2 students) and Spanish program (12 students). While most students were Americans, five were non-native speakers of English, their native languages being Portuguese, Russian and Spanish. Before beginning their studies at U1 and U2, all international students passed the TOEFL test with scores of 250 and higher, well above the minimum requirements of 230 and 193 for U1 and U2 respectively, and passed an additional proficiency exam administered by their universities.

The age of the participants was also very heterogeneous, from undergraduate students in their early 20s to non-traditional students in their 40s pursuing a second career path. Unlike most of the U1 students, the U2 students were not teaching yet. Instead, they were assisting and observing other teachers. However, several had previous teaching experience.

Task

Students engaged in five different online bulletin board discussions with the topics and assessment guidelines set by the teachers (see Appendix A for topics and Appendix B for the rubric). The goal of the discussions was to engage students in interactive reflection of class material and its practical applications as well as to provide a support network for the new and future teachers, where they could discuss their questions and concerns with other students also in the beginning of their teaching careers. The instructors provided the triggering questions but did not participate in the discussion in order to communicate to the students that the students and not the teachers were in control of the discussion with the freedom to take topics in any direction in which they were interested, and that they were responsible for the outcomes of the discussions.

The topics were related to reading assignments and themes the two teachers had discussed in their classes and spanned a variety of teaching methodology topics ranging from theoretical to practical concerns. The first discussion was mainly for students to get to know each other and to discuss their opinions about the advantages and disadvantages of being a nonnative or native speaker as a FL teacher. This was not a topic students had read about or discussed in class. Several weeks later, after both classes had discussed theories of learning, they were asked to apply a learning theory (behaviorism, constructivism, socioconstructivism, etc.) to something they had learned (how to drive a car or dance the tango, etc.) and analyze it accordingly. The purpose of this topic was for the students to apply theory to a real life situation. To change the discussion from theory to practice, the third topic related to anxiety and motivation. The students reflected on past FL learning experiences and their levels of motivation and anxiety, possible reasons for their emotions, and what they could have done to change those feelings. Then they brainstormed ways to influence their students' level of motivation and/or anxiety. The fourth topic – analyzing and introducing the textbook they use/will be using to teach – was a mixture of theory and practice. The U2 students, since they were not yet teaching, had to analyze a textbook based on future use, whereas the U1 students, who were, all except for one, already teaching, could comment on their textbook from experience. Finally, the last topic was mainly practical again. Students discussed culture,

how to incorporate it into a language class, how language and culture are related, and problems with teaching culture. Many students also used this last discussion as an opportunity to say goodbye to their group members. As explained above, there was a balance between practical and theoretical topics to give students a chance to explore and reflect on various aspects of teaching. The questions were designed to promote different cognitive behaviors, such as application (topic 2), synthesis (topic 5) and evaluation (topic 4).

Before the first discussion, the teachers formed heterogeneous groups of four or five, based on factors such as age, gender, nationality, and language of study with at least one U1 student per group. Groups were changed after the second discussion due to personality conflicts within one group and to allow students to meet other members of each class. However, after this first rearranging, the groups remained the same for the rest of the semester and all contained at least one U1 student.

Each discussion lasted five days and students' contributions during all five discussions made up 15% of their final grade (see Appendix B for rubric). Students at both universities were assessed by the same grading rubric and were graded according to the following four criteria: 1) theoretical knowledge (to encourage them to bring in information from their readings and class discussion), 2) connecting theory to their experiences/opinions/comments, 3) interactivity (to persuade them to engage in a dialogue rather than monologues (Henri, 1995)) and 4) actively contributing to the discussion. Students were graded directly after completion of the discussion to provide them with immediate feedback about their performance.

Data Analysis

The primary data were the discussion transcripts from each group, totaling 27 discussions. In addition, students completed a survey at the end of the semester, which included Likert-type questions, as well as several open-ended questions relating to students' feelings about their CMC experience.

These data were collected to address the following four research questions for this study:

1) Do participants in electronic exchanges engage in monologues or dialogues?
2) What types of social activity do students engage in?
3) What types of cognitive activity do students engage in?
4) Do the levels of social and cognitive activity differ between discussions?

Since students often addressed several different topics in a single posting, the transcripts were first divided into speech segments, "the smallest unit of delivery, linked to a single theme, directed at the same interlocutor" (Henri & Rigault, 1996, p. 62). During a training process using one group's discussion, the coders established an interrater reliability of 92% for parsing speech segments. Then, using the Garrison et al. framework (2001), both researchers coded the social and cognitive speech segments in the same training transcript. From this analysis, they established an interrater reliability of 89% for the social and 86% for cognitive categories. After achieving this interrater reliability, one of the researchers coded the transcripts of all five discussions for cognitive presence while the other researcher analyzed social presence.

According to the Garrison et al. (2001) framework, learning in an online environment occurs through the interaction of the following elements: social presence, teaching presence, and cognitive presence (see Table 1). Social presence includes three categories: 1) emotional expression, such as humor or sharing feelings about the educational experience, 2) open communication including anything to show awareness of the other participants, such as referring to others' comments or quoting someone, and recognition of each other's contributions, such as expressing agreement or complimenting, and 3) group cohesion, anything that reinforces the group dynamic and builds participation, such as greetings, addressing interlocutors by name, personal questions, and good-byes. Although Garrison et al. (2001) acknowledged the importance of the social element in a CMC discussion, few studies have considered it during their

analyses, instead focusing mainly on the cognitive side of the discussion (Gunawardena et al., 1997; Kanuka & Anderson, 1996, Pawan, et al., 2003).

In the case of this study, since the teachers did not comment on the discussion board, all of the teaching presence fell under the category of "instructional management," such as "setting the curriculum" and "designing the methods/assessment," and could not be coded within the discussions. Most of the teaching presence took place before the discussions began in the form of the guiding questions (triggers) and assessment guidelines. Therefore, the instructors had considerable *indirect* influence on the outcome of the discussions. Although Garrison et al.'s framework and several studies (Gunawardena et al., 1997; Mazzolini & Maddison, 2003; Pawan et al. 2003; Weasenforth et al., 2002) suggest that teacher participation is an integral component of electronic discussions, we chose to examine how students constructed meaning and social dynamics without the teachers participating in the dialogue.

The third component in the Garrison et al.'s (2001) framework is cognitive presence, including four steps progressing from lower- to higher-order thinking. The triggering event, recognizing a problem or expressing puzzlement, begins the dialogue. This leads to exploration, when participants brainstorm, make suggestions, and search for clarification of the problem. Step three is integration, when interlocutors begin to create solutions to the problem. Finally, students reach resolution when they are able to apply their new ideas and solutions.

FINDINGS

The survey responses were compiled and in the case of the 12 Likert-type responses, tallied by percentages, and the answers to the three free response questions were categorized by themes. The cognitive and social aspects of the discussions were analyzed using Garrison et al.'s framework of a community of inquiry (2001). The frequencies from this analysis were then used for a chi-square analysis to test distribution and measure how the findings differed from the statistically expected values. To account for quantitative differences in student production, the raw numbers were used to calculate density figures for each discussion. This measure, proposed by Rourke, Anderson, Garrison, and Archer (2001), reflects the number of occurrences of a specific social or cognitive event per 1,000 words. To calculate density numbers, the number of observed events is divided by the discussion's total number of words and then multiplied by 1,000.

Survey - Social Results

On the survey, many students reported that they felt a sense of community with the other students in their group (57%) and preferred having discussions with people from a different university (65%), which suggests that students benefited from linking universities. They were able to compare their graduate programs and commiserate on the expectations of new graduate students. In the free responses, students commented that they enjoyed the "informal nature of the discussion board," that "it was done in such a relaxed and free situation," and ""that it might make communication easier." Another student responded that it was "very useful for sharing interesting ideas and suggestions for classroom activities."

On a more negative side, one student commented that she would have preferred the discussion in person and another student remarked that she did not feel connected to the other group members, which she attributed to the reorganization of groups after discussion II. However, another student commented that she liked changing groups because it exposed her to even more different points of view.

In general, the analysis of the discussions that follows supports the findings from the survey. Most groups engaged in a high level of social activity, higher than cognitive activity, in fact. However, there were some groups that connected more than others on a social level, as reported in the survey, where some students reported feeling closer to their group members than others.

Table 1: Framework of a Community of Inquiry by Garrison, Anderson, and Archer (2001)

Social Presence	**Emotional Expression** = ability/confidence to express feelings related to educational experience	**Humor**	
		Self-Disclosure = sharing of feelings/attitudes/experiences/interests	
	Open Communication = reciprocal/respectful exchanges	**Mutual Awareness**	Use of reply feature
			Quoting directly
			Directing a comment at an individual
			Referring explicitly to content of others' messages
		Recognition of each other's Contributions	Explicitly expressing appreciation/agreement
			Complimenting others
			Encouraging others
	Group Cohesion = activities that build/sustain a presence of group commitment; focused collaborative communication that builds participation/empathy		
Teaching Presence	**Instructional Management** = structural concerns	Setting Curriculum, Designing Methods/Assessment	
		Establishing Time Parameters	
		Utilizing the Medium	
	Building Understanding = concern with productive/valid knowledge acquisition	Creating Effective Group Consciousness	
		Identifying Areas of (Dis)Agreement	
		Seeking to Reach Consensus/Understanding	
	Direct Instruction	Assess Discourse	
		Assess Efficacy of Educational Process	
Cognitive Presence	**Triggering Event** = state of dissonance/feeling of unease resulting from an experience	Recognizing a Problem	
		Sense of Puzzlement	
	Exploration = search for information/ knowledge/alternatives that might help make sense of the situation/ problem; search for clarification	Information Exchange	
		Discussion of Ambiguities	
	Integration = integrating information into a concept/idea; looking for insights/ gaining some understanding of acquired information/knowledge	Connecting Ideas	
		Create Solution	
	Resolution = application of idea/concept	Vicariously Apply New Ideas	
		Critically Assess Solutions	

Transcripts - Social Presence

The transcripts of all five discussions were used for the qualitative analysis. During the third discussion, students produced the most output with over 21,000 words while the first topic had the smallest production of less than 13,000 words. Each group of four to five students generated between nine and thirty messages for each topic, totaling between 1,500 and 5,900 words. The length of individual messages varied greatly, ranging from only two to over 560 words.

Table 2: Summary of Raw Numbers for the Categories of Social and Cognitive Presence

	DISCUSSION				
	1	**2**	**3**	**4**	**5**
SOCIAL					
Emotional	12	15	5	6	3
Open Communication					
Mutual Awareness	100	187	162	164	227
Recognition of Others	26	34	44	24	80
Group Cohesion	140	120	122	159	184
Total # of Social Events	**278**	**356**	**333**	**353**	**494**
COGNITIVE					
Trigger	22	31	10	21	26
Exploration	121	76	103	183	106
Integration	43	104	105	51	103
Resolution	1	0	2	1	10
Total # of Cognitive Events	**187**	**211**	**220**	**256**	**245**
Total # of Words	**12,948**	**17,810**	**21,149**	**17,157**	**19,588**
Ratio Social Events : Cognitive Events (in %)	**60 : 40**	**63 : 37**	**60 : 40**	**58 : 42**	**67 : 33**

Table 3: Summary of Density Numbers for the Categories of Social and Cognitive Presence

	DISCUSSION				
	1	**2**	**3**	**4**	**5**
SOCIAL DENSITY	**21.47**	**19.99**	**15.75**	**20.57**	**25.22**
Emotional	0.93	0.84	0.24	0.35	0.15
Open Communication					
Mutual Awareness	7.72	10.50	7.66	9.56	11.59
Recognition of Others	2.01	1.91	2.08	1.40	4.08
Group Cohesion	10.81	6.74	5.77	9.27	9.39
COGNITIVE DENSITY	**14.44**	**11.84**	**10.40**	**14.92**	**12.51**
Trigger	1.70	1.74	0.47	1.22	1.33
Exploration	9.35	4.27	4.87	10.67	5.41
Integration	3.32	5.84	4.96	2.97	5.26
Resolution	0.08	0	0.09	0.06	0.51

In all 5 discussions, social activity outweighed cognitive events and accounted for 58% to 67% of total events (see Table 2 for raw numbers and percentages). The neutral measure of density was also included in the analysis to account for the variations in length mentioned above. Social density ranged from 15.75

in discussion III to 25.22 in the last discussion, which means that between 15.75 and 25.22 social events occurred on average per 1,000 words in these discussions (see Table 3 for density numbers).

Emotional Expression

In all five discussions, emotional expressions accounted for less than 5% of the social utterances with the emotional expression density ranging from 0.15 in the last discussion to 0.93 in the first. These numbers show that emotional expressions occurred very infrequently, on average less than one occurrence per 1,000 words. During the first discussion where students were getting to know each other and the second discussion on learning theories, students contributed the most emotional expressions. A chi-square analysis (x^2(12, N = 1814) = 62.88, p = .000) revealed that during these discussions, emotional expression occurred more frequently than statistically expected (discussion I: f = 12, f_e = 6.3; discussion II: f = 15, f_e = 8).

In the second discussion, the higher number of emotional expressions was likely due to the fact that the students had initially misunderstood the question and thought it was referring to teaching methods instead of learning theories. In contrast to the second discussion's several references to the task, most of the emotional comments in the other discussions referred to how well they liked or disliked the topics. When writing about textbooks, a student with a negative opinion about the discussion topic was able to change her perspective with the help of another student.

> "Well, speaking seriously, I feel that if I could have this discussion with other people from French, that it would be more advantageous. I feel that, for this kind of discussion, groups should have been changed, so that people would be able to discuss textbooks with other people that will be teaching the same language."

This student's frustration with the textbook topic is refuted by another student, who has a different opinion about the value of the subject.

> "Let me tell you that I don't think that discussing about a French book is going to be a waste of time for any of us. (. . .) Briefly, the idea is that after this discussion we have a better understanding of our books so we can maximize their use by being selective and reflexive (taking in account the communicative teaching methodology that we've been studying)."

The first student stood corrected and replied:

> "I have to start by saying thank you for clarifying to me the value of this discussion. (. . .) It's always good to discuss the books we will be using as teachers, even if we'll be teaching different languages."

Although students did not often express their opinions and feelings about the topics, they had the opportunity to express frustration, receive support and feedback, and in at least one case, change from a negative to a positive attitude about the topic.

Open Communication

Open communication is divided into the categories of mutual awareness and recognition of others. It is characterized by reciprocal and respectful exchanges, which help build a community and keep each other engaged in the task. Students referred to previous postings, incorporated others' comments into their own postings, built on each other's postings, and directed questions at group members regarding previous postings, which indicates that they were engaged in dialogues instead of monologues. With a range from 7.66 (discussion III) to 11.59 (discussion V), the density numbers for mutual awareness show that this type of behavior took place quite regularly in the online discussions, but recognition of others was not as common (density: 1.40 – 4.08). Below are examples of comments coded under open communication.

> *Compliment* – "What you wrote about the cultural aspect sounds pretty cool."

Adding to previous comment - "I have so many thoughts about all of the things you have discussed …hmmmmm…where to start?"

Direct question – "I have a question for you as well. How much do you think psychological factors play into a student seeming non-motivated?"

Referring to previous posting – "Your example of schema and language learning is something I can relate to – having grown up speaking Spanish, taking French was bit easier for me than the other students in my class."

The above examples reflect various ways in which students created a dialogue where participants felt listened to and were encouraged to participate.

Group Cohesion

The last category of social presence is group cohesion, consisting of utterances that contribute to building a supportive community learning environment and participation within the groups. This category occurred most frequently in the first discussion and was the second most frequent social indicator in discussions II-IV, which is reflected in rather high density numbers: 5.77 to 10.81.

Group cohesion is aimed at building a rapport with the group and includes introductions to themselves and to their postings, general questions, salutations, and goodbyes. After the introductions during the first discussion, students had an idea of who everyone was and continued to build group cohesion in future posts as illustrated by the following examples.

Salutation – "What's up Tennessee!"

Good-bye – "Talk to you later and have a good start in the new week." "Well, enjoy the weekend. Monday morning comes too early!"

Direct questions for the group- "What's it like for you guys? Are you ever anxious? What makes you feel motivated? And what do you do to help your students with anxieties?"

In some cases these utterances did not even refer to the task, such as when one group discussed their favorite music groups, but they helped group members to get to know each other and to feel comfortable writing with each other.

According to both the survey results and the discussion analysis, emotional expression, open communication, and group cohesion appeared to contribute to students' sense of belonging to a community, which in turn lowered their anxiety and helped them to feel at ease expressing themselves and asking questions.

Survey – Cognitive Results

Several items on the questionnaire were designed to investigate which cognitive benefits the participants experienced. The students' responses indicate that the electronic discussions provided a cognitively unique environment. Sixty-one percent of students agreed with the statement "I learned things in the discussions that I would not have figured out on my own or in class discussions", which indicates that most students felt that the interactive process of the electronic discussions promoted their learning. Many participants (82%) attributed this advantage to the fact that the discussions were conducted in a written mode and reported that the process of talking/writing through topics helped them to understand them better.

The vast majority (96%) reported that their discussion partners' contributions exposed them to new perspectives that they would not have considered on their own. As a result, they broadened their view and understanding of various issues. Another advantage was that the discussion board provided a forum where

students felt free to ask questions they would not have asked in class discussions, according to fifty-two percent.

In their answers to the open-ended questions on the survey, several participants reiterated these beliefs about the cognitive benefits of online discussions. One student recalled that talking about the topic "clarified some things for me. When I read all the entries my 'light-bulb' came on frequently, not just as far as understanding the topic goes, but mostly because good ideas were brought up." The remark of another student, who stated that "writing helped absorb ideas," illustrates the value of the written mode. Students also commented on their exposure to new ideas and different perspectives: "It was very enriching to find out what other students thought about the topics who came from different backgrounds." And while not everybody was convinced that the discussion board enriched their knowledge of the topics, they still valued the discussions, as illustrated by this statement:

> "I honestly don't believe the discussion board contributed to my understanding of the class material, but I did find it very useful for sharing interesting ideas and suggestions for classroom activities."

Although this student claimed the discussions did not further her understanding of the issue, sharing ideas and suggestions still contributed to her growth as a teacher, which ultimately has cognitive benefits.

Transcripts – Cognitive Presence

Overall, social activity outweighed cognitive events and displayed a considerably higher density. Cognitive density ranged from only 10.40 in discussion III to 14.92 in discussion IV, compared with social density numbers of 20.0 or above for all discussions except for discussion III.

As discussed earlier, Garrison and his colleagues (2001) defined four indicators of cognitive presence: trigger, exploration, integration and resolution. In the first and fourth discussions, the most common indicator of cognitive presence was exploration for all groups, representing between 54% and 83% of cognitive activity in each group. For discussions II, III and V, exploration or integration occurred most frequently, depending on the group. Resolution was represented by the least amount of utterances in all of the discussions.

Trigger

A triggering event begins the dialogue or takes it into a new direction, often by asking questions. In this study, the initial triggers, the topics for the electronic discussions, were provided by the two instructors.[2] However, the participants were encouraged to expand on the topics, which they did frequently, as this excerpt from the third discussion illustrates.

> "I totally agree with you on the issue of participation. I have always had problems participating in class. I remember (…) when I would see the dreaded outline of the course that stated (…): your participation grade will consist of 15% of your grade. What does that really mean? (…)What qualifies participation? Is it anything that you can think of to say? Does it need to pertain to the class at hand?"

The group had been discussing the relationship between a student's personality and his/her level of participation when this student brought up the related issue of how to grade participation, thereby redirecting the discussion, an example of how students' postings build on each other.

Overall, students produced the fewest triggers in the third discussion ($f = 10$) and the most in discussion II ($f = 31$), a trend that is also reflected in the trigger density numbers, which ranged from 0.47 to 1.74. In fact, a chi-square test for comparison   (x^2 (12, N= 1089) = 149.998, p = .000) revealed that the frequencies of triggers in discussions II and III are different from the statistically expected values. Triggers were more likely to occur in the second discussion and less likely in the third.

The low number of triggers for the second discussion is not surprising considering that the topic provided by the teachers to initiate the discussion contained several very specific questions, unlike the more broadly formulated topics of other discussions. In discussion III, the topic might also have contributed to the number of triggers, which was higher than statistically expected. It seems that students saw a connection between the topic and issues such as individual learner differences. In addition, sharing a personal memory of a learning experience often led others to ask off-task follow-up questions (e.g., Do you still play the guitar?), which were coded as triggers.

Exploration

A new trigger usually leads to a search for information to help make sense of the problem, which Garrison et al. (2001) labeled the exploration phase. At this stage, interlocutors typically engage in brainstorming, provide suggestions for consideration, or leap to conclusions. This type of cognitive activity is reflected in the following posting from discussion III:

> "For me, my foreign language experience has been different than yours, because when I first had to learn English I was living in an English speaking place (Canada). Therefore, I can say that my intrinsic motivation to learn English was very strong."

This student adds her personal narrative to the information exchange about the role of motivation and anxiety in FL learning. Comparing her own experience with that of a group mate, she builds on someone else's contribution. This type of interactivity occurred frequently at the exploration stage. It is important to note, however, that she does not use it to support an opinion. Instead, she just offers it to the discussion forum for the others to consider.

A comparison of the different discussions revealed that discussions I ($f = 121$; $f_e = 96$) and IV ($f = 183$; $f_e = 131.4$) included more explorations than statistically expected. The exploration density numbers are also considerably higher for those discussions (9.35 and 10.67 respectively). Again, the type of task can explain this increased level of explorations. For the first discussion, students were asked to introduce themselves to their groups, which involves a high amount of information exchange. The same is true for the fourth discussion, which asked students to describe and evaluate the textbooks they are or will be using for teaching. Since only one or two students in each group were familiar with the same textbook, they first had to provide their discussion partners with basic descriptive information. Discussions II ($f = 46$; $f_e = 92.9$) and V ($f = 106$; $f_e = 125.8$) yielded less explorations than statistically expected. This difference was especially drastic for the second discussion, where 92 explorations were statistically expected and only 46 produced. This low number of explorations is, however, accounted for by the high number of integrations in discussion II, to be discussed below.

Integration

At the integration phase, the information previously gathered at the exploration phase is integrated into a concept or idea to construct meanings or solutions to an issue. This can involve reference to a previous message with substantiated agreement or disagreement, building onto others' ideas, developing a justified yet tentative hypothesis, and integrating information from other sources. This type of cognitive process is illustrated in this contribution:

> "What you mentioned about the presence of native speakers I think works for other people as well, for example when you have a person in your class that seems to know EVERYTHING! In my linguistics class we have a guy who seems much more advanced than everyone else, which at first I found a little intimidating."

This student takes the comment of one of her group mates, that the presence of native speakers in a FL class can cause anxiety in non-native speakers, and expands on it. She proposes that anyone who is perceived as an expert can have this anxiety producing effect.

As mentioned above, creating a solution is also an indicator of this stage. In the following excerpt, the author suggests how her teammate can overcome her reluctance to participate in class:

> "I see that what is bringing you pressure is the fact of being always the best. Maybe you have to learn that the target is not to be the best but to do well enough and enjoy while learning."

In this example, the integration reflects the shared inquiry space of the discussion board and is truly interactive: the student reaches the integration stage based on someone else's exploration. However, there were also instances when integrations occurred in the private reflective world of the learner, possibly facilitated by the writing process, and manifested themselves in the discussion board. The following example illustrates a student's individual growth at the integration level. After several paragraphs describing her own difficulties learning English, the student concludes:

> "So, from this experience, one thing I've always tried to do is show students as much respect as possible. They are accepted even making mistakes."

An analysis of the numbers shows that students engaged in more integration than statistically expected in discussions III (f =105; f_e = 82) and especially II (f =104; f_e = 67.5). During the first (f = 43; f_e = 69.7) and fourth discussions (f = 51; f_e = 95.4), however, there was significantly less activity at the integration level. The difference was especially strong for the fourth discussion. The integration density for these discussions mirror this trend and range from 2.97 for discussion IV to 5.84 for discussion II.

The increased and decreased activity at the integration level might be due to the type of topic. Discussion IV, for example, focused on a textbook evaluation - a topic that does not necessarily lend itself towards the creation of solutions, whereas discussion II required students to integrate theory with previous learning experiences during their examination of learning theories.

Resolution

Finally, the new meaning or solution is applied, assessed, or defended in the resolution phase. Across all discussions, this type of cognitive activity was observed the least. For all groups combined, there were no incidents of resolutions in discussion II, one in discussions I and IV each, two in discussion III and ten in the last discussion, seven more than statistically expected. Like the frequency numbers, the density numbers for this category are also very low. In fact, they do not reach the 1.0 mark.

The fact that most resolutions occurred in the last discussion can be attributed to the topic, which included an explicit question about possible solutions to the dilemma of teaching culture in language courses. While one would not expect a discussion's resolution density to be nearly as high as the densities for other phases – after all, the integration and exploration phases build up to resolutions, where the discussion culminates – this study's resolution densities are relatively low.

Following is a contribution from the discussion about motivation and anxiety that was coded as a resolution:

> "I agree with you and I can tell from my own experience that working with song texts while the students listen to the songs and fill in some gaps is a great means of motivation. It's important to reach into the students' world, what they're interested in and what they are familiar with in order to get their attention. Music makes up an essential part of many students' interests."

This student assesses the tentative solution provided by a group mate (i.e., to teach culture through the use of music) with her own experience and provides an additional reason why this technique should be successful. Yet, students usually did not receive the essential feedback from their groups to confirm or reject their constructed meanings/solutions, which suggests that it was not necessarily the group that found and tested a solution but rather an individual, based on the input of the interlocutors from the

preceding three stages. Nevertheless, in the discussion focusing on ways to teach culture, there was one instance when a student did evaluate a solution another group member had proposed earlier:

> "I really like Clara's idea of the culture presentations. I think [it] is fun, vivid and [more] effective… than just read a passage that may be interesting for the textbook writers but not completely for the interests of… North American college students. But what I will add to the presentation is kind of a follow-up: I will make the students think what they have learn[ed], make them tell me if they agree or disagree and… if that particular cultural aspect could be possible in their own culture."

CONCLUSION

The data analysis provided the following answers to the research questions of this study.

Question 1: Do participants in electronic exchanges engage in monologues or dialogues?

The high number of contributions categorized as mutual awareness and recognition of others shows that students did indeed engage in interactive discussions, not monologues. These findings seem to differ from those of Henri (1995), Pawan et al. (2003), and Pena-Shaff and Nicholls (2004) who found that their students focused on their own ideas rather than incorporating them into the ideas of their group members. In the Henri (1995) study, learners related more to the animateurs (whose function was to keep the exchanges flowing) and the experts than to each other and did not integrate each other's comments into their own. It seems that due to the presence of the experts, the learners felt it was more important to attend to their comments than those of their peers. In the present study, the lack of teacher participation in the conversation prevented such behavior. Pawan et al. (2003) and Pena-Shaff and Nicholls (2004) both attributed their findings to low participation and lack of guidance in the discussions. Requiring our students to post three times during the week and providing them with specific questions and grading guidelines may have been significant factors in promoting dialogue.

In addition to the above results, there have been many other studies that reinforce the findings of the current project. The students in the Kanuka and Anderson (1996) and Cole et al. (1998) analyses reported that they enjoyed the forum for the possibilities it provided to share and receive information, while students in other investigations (Bonk et al. 1998; Kamhi-Stein 2000; Mitchell 2003) were able to make connections between peers, experts, readings, and their own experiences while building on each other's comments. And although Pawan et al. (2003) and Pena-Shaff and Nicholls (2004) found examples of serial monologues rather than reflective and critical dialogues, they also reported that their students shared and exchanged information while constructing postings based on previous ones.

Question 2: What types of social activity do students engage in?

The transcript analysis found examples of all categories of social presence as defined in the framework by Garrison et al. (2001). It is interesting to note that social presence behaviors made up the majority of online activity. This finding differs from those of other studies, which had lower levels of social presence (Garrison et al., 2001; Meyer, 2003). In Meyer's study, for example, social presence made up only 3% of overall activity. We propose two hypotheses for these divergent results. Since teachers did not post during the discussions in the present study, students may have felt freer to engage in social activity and, since our grading rubric included categories for interactivity, students may have felt compelled to try to connect on a more personal level.

Among the categories of social presence, emotional expressions had the fewest occurrences, likely due to the grading criteria used to evaluate the discussions. Students might have considered emotional expressions off-task and avoided them. Weasenforth et al. (2002) also noted that their evaluation form was an effective way to communicate to the students their goals for the discussions and to affect students' online behavior.

The considerable amounts of open communication and group cohesion in these discussions indicate that collaborative learning was taking place while a learning community was being formed. Classroom instruction and the online discussions led to the development of two separate, yet connected, learning communities, one defined by university boundaries and another, where students met peers from another university (and, in the case of U2 students, classmates as well).

Question 3: What types of cognitive activity do students engage in?

We found evidence of all categories of cognitive presence in the transcripts. Similar to other studies (Garrison et al., 2001; Meyer, 2003, 2004; Newman et al., 1996; Newman et al., 1995; Pawan et al., 2003), exploration and integration were the most common. The category of resolution had the fewest occurrences, a result comparable to those of previous studies (Garrison et al., 2001; Meyer, 2003), yet contradicting Pawan and her colleagues (2003) who did not find any evidence of resolutions.

Throughout the semester, students moved between their private world for reflection and the socially shared space of inquiry on the discussion board. Especially at the exploration and integration levels students worked together to search for information and construct solutions. This type of interactivity, however, was far less common at the resolution stage, which would have transferred an individual's solution into the realm of shared knowledge, a finding similar to that of Pena-Shaff and Nicholls (2004), suggesting that students did not take full advantage of their shared space of inquiry. Overt teacher involvement in the discussions, and/or making students aware of the four cognitive stages in order to raise their meta-cognitive awareness, could encourage more resolutions (Pawan et al., 2003).

The fact that students' advanced cognitive activity often occurred in their private world raises an important question about online collaboration: What, if any, cognitive advantages does ACMC offer? While truly interactive resolutions would have been more desirable, it is important to keep in mind that these *individual* resolutions were often based on *collaborative* integrations. Individual students might not have been able to reach the resolution stage without the input of other students, which allowed them to work collaboratively towards the resolution stage. Arguably, this would have been harder to achieve in the oral mode, which creates a sense of urgency. But ACMC allows time for reflection, which is especially important to reach the integration and resolution stages (Garrison et al., 2001). These claims are also supported by the survey where most students agreed that the collaborative nature and written mode of the discussions enhanced their learning and provided them with time to reflect on their beliefs.

Question 4: Do the levels of social and cognitive activity differ between discussions?

A comparison between the discussions in the current study revealed that there were indeed differences in the quantity and quality of social and cognitive events. The topic seemed to be the major influence on the number of triggers, integrations and resolutions, a finding also supported by other studies (Hollingshead & McGrath; 1995, Garrison, Cleveland-Innes, & Fung, 2004; Pawan, et al., 2003; Pena-Shaff & Nicholls 2004). Although resolutions occurred infrequently, the few resolutions that did occur took place in the last discussion, which specifically asked students to come up with a solution to a problem. This outcome concurs with the results of Newman et al. (1996), who claimed that the more cognitively advanced a discussion becomes, the greater the effect of the subject discussed. Therefore a task specifically designed for resolutions should encourage such cognitive activity. It is important to note, however, that although one task was specifically formulated to encourage resolutions, not as many students reached this level of cognitive processing as we would have hoped. Two of the five groups showed only one instance of resolution each, while another group failed to reach this level altogether.

The fact that students were able to reach the advanced stages of cognitive presence on their own, although on a limited scale, shows that overt teacher facilitation is not necessary to support advanced cognitive presence. Instead, a well-formulated task, which Garrison et al. (2001) included in their category of teaching presence, can stimulate resolutions. However, teacher involvement and prompting might be

necessary for students to reach the resolution stage more frequently and collaboratively with feedback and input from other students.

In summary, it can be said that this implementation of ACMC was successful for the following reasons: (1) students enjoyed the discussions (83%) and would enjoy participating in such a discussion again (65%)[3], (2) they perceived them to be beneficial to their teacher training for both cognitive and social reasons, (3) they engaged in in-depth processing, 4) they used online discussions to form their own virtual learning communities, and (5) they reported that they are likely to use CMC in their own teaching (87%).

Limitations and Future Research

At this point, it is important to remember that this study's analysis was limited to how students' cognitive and social processes manifested themselves in writing. But as Schallert, Reed and the D-Team emphasized (2003), "students learn not only by posting comments in the discussion but also by reading other students' and their teacher's comments" (p. 109). Therefore, this study captured only external cognitive and social behaviors without being able to consider hidden internal processes.

Given the complex interactions between a variety of factors and the outcomes of CMC (e.g., Baym, 1995), it is impossible to generalize from the findings of this study, which are unique to the context of this particular implementation of ACMC. More research is needed to manipulate single variables (e.g., group size, participants' personality) and investigate their effects on electronic interactions. For example, there could be a correlation between the degree of cognitive or social presence and an interlocutor's teaching experience. There might also be differences between native and non-native speakers' levels of social and cognitive activity. However, these questions were not within the scope of this study.

In addition, studies on the interplay between social and cognitive presence in electronic discussions will answer questions about the specific roles of social presence in cognitive development, such as whether social presence and students' enjoyment of online discussions sustain cognitive activity. The question of teacher participation in the actual discussion should also be addressed in later studies to measure whether teacher presence promotes resolutions or what other methods or tasks could be used to encourage students to work together to reach the resolution stage.

APPENDIX A

Student Handout with Guidelines and Topics for Online Discussions

Format:
To make the discussions more manageable, you will be divided into six groups of four students.

Guidelines:
The electronic discussions serve two purposes. They allow you: (1) to use personal experiences to reflect on what you have read/learned in this course so that you will be better able to connect the issues with a real-life, personal experience. This will help you understand and remember them better. And (2) to be exposed to different points of view and gain a better understanding of the complexity of these issues by discussing the topics with your group members.

It is not necessary to summarize all the information of the chapter but you are expected to demonstrate some theoretical knowledge of the issues. Therefore, you should make an explicit connection between the theory covered in the readings and your own experiences learning a foreign language. Keep in mind that this should be an *exchange of ideas and opinions* so be sure to respond to your group members' postings. There is no required length on the postings, however, you will be graded according to how well you integrate your own ideas and opinions with what you learned from the readings and how well you

demonstrate that you have read your other group members' postings and integrate their comments into your responses.

List of Topics & Dates:

The topics listed here are not exhaustive so feel free to expand on them.

- Topic #1, Sept. 2-5:

Get to know the members of your group. Discuss the advantages/disadvantages and differences of native speakers and non-native speakers as foreign language teachers.
For this discussion, you are not expected to make reference to our readings, just base your opinions on your own experiences and ideas.

- Topic #2, Sept. 8-12:

Reflect on one of your past learning experiences (i.e., how to drive a car, dance the tango). Choose one of the learning theories we have discussed to describe, explain, and evaluate your learning process and experience.

- Topic #3, Sept. 29-Oct. 3:

Think about a present or past foreign language learning experiences. Assess the extent to which you felt motivated or anxious while learning that language. What specific factors made you feel that way? Is there anything you could have done to change the intensity of those feelings? What can you as a teacher do to influence your students' level of motivation/anxiety?

- Topic #4, Oct. 20-24:

Introduce the textbook you are using/will use to your group members. Discuss and evaluate its features and organization: What is the theoretical basis of the book (this is usually explained by the authors in the introduction)? What types of activities are included (i.e., mechanical/meaningful/communicative drills vs. free techniques) and how are they weighted? How are they sequenced? How are the four skills integrated? How does your textbook account for context? How is culture incorporated? etc.

- Topic #5, Nov. 17-21:

Current trends in foreign language pedagogy emphasize the importance of teaching culture. Why do you think it is considered important to incorporate culture into a *language* class? What is the relationship between language and culture? How can culture be taught without sacrificing language instruction? What are potential problems that teachers might encounter when they teach culture?

Procedure:

To get the discussion going, you have to post your first message by 8 am on the second day of the discussion period (which usually falls on a Tuesday, expect for topic #1). You should post *at least* two more times after your first message.

APPENDIX B

Grading Rubrics for Online Discussions

Criteria		Max. Points	To be awarded maximum points for this category you should…
	Theoretical Background Knowledge	10	Demonstrate a solid understanding of the theoretical issues associated with the topic.
	Connection between Theory and Topic	10	Make an explicit connection between theory and your experience/opinion/comment.
	Interactivity	10	Explicitly respond to your group members' postings and integrate them into your responses.
	Amount of Contributions	10	Be an active contributor to the discussion.

Since the topic for the 1st discussion is more limited, it was graded differently.

Criteria		Max. Points	To be awarded maximum points for this category you should…
	Reasoning	10	Provide explicit support for your opinion.
	Establishing Rapport	10	Make a strong effort to get to know your group members.
	Interactivity	10	Explicitly respond to your group members' postings and integrate them into your responses.
	Amount of Contributions	10	Be an active contributor to the discussion.

APPENDIX C

End-of-Semester Survey on Online Discussions

Please circle the answer that best fits your opinion about the electronic discussion this semester: strongly agree, agree, neutral, disagree, strongly disagree.

1. I enjoyed the electronic discussions this semester.

strongly agree   agree   neutral   disagree   strongly disagree

2. I learned things in the discussions that I would not have figured out on my own or in class discussions.

strongly agree   agree   neutral   disagree   strongly disagree

3. The electronic discussions gave me the opportunity to ask questions I would not have asked in class discussions.

strongly agree   agree   neutral   disagree   strongly disagree

4. I would enjoy participating in such a discussion again.

strongly agree   agree   neutral   disagree   strongly disagree

5. The process of talking/writing through topics helped me to understand them better.

strongly agree   agree   neutral   disagree   strongly disagree

6. Chatting with other students helped me to look at topics from perspectives I would not have considered on my own.

strongly agree   agree   neutral   disagree   strongly disagree

7. The forum of the electronic discussions provided less anxiety and a more relaxed environment than classroom discussions.

strongly agree   agree   neutral   disagree   strongly disagree

8. I would have liked this class better without the electronic discussions.

strongly agree   agree   neutral   disagree   strongly disagree

9. I would have preferred to chat only with people from my university.

strongly agree   agree   neutral   disagree   strongly disagree

10. I hope to keep in touch with one or more of my discussion partners.

strongly agree   agree   neutral   disagree   strongly disagree

11. I experienced a sense of community with the other students in my group.

strongly agree   agree   neutral   disagree   strongly disagree

12. This discussion gave me good ideas for teaching that I implemented this semester or plan to implement when I start teaching.

strongly agree   agree   neutral   disagree   strongly disagree

13. Please describe how you felt about the electronic discussion both from an affective and a cognitive perspective. Did it help you to learn or understand the material more fully? Did it lower your "affective filter" to make discussions more enjoyable?

14. What suggestions do you have for improving this exchange?

15. After having participated in this electronic exchange, would you be more or less inclined to implement computer-mediated communication into a class you would teach? Why or why not?

NOTES

1. Authors are listed in alphabetical order and contributed equally to the manuscript.

2. The triggers provided by the instructors were not included in the analysis.

3. For the purposes of comparison, agree and strongly agree were combined in the percentages.

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