

Comparing Face-to-Face and Electronic Discussion in the Second Language Classroom

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Abstract:

One of the supposed benefits of computer-mediated communication is that it can result in more equal participation among students. This study tested that claim by comparing equality of student participation in two modes: face-to-face discussion and electronic discussion. In a counter-balanced, repeated measures study, small groups of ESL students conducted discussion face-to-face and electronically. Amount of participation was calculated per person for each mode and was correlated to factors such as nationality, language ability, time in the U.S., and student attitude. In addition, a global measure of equality of participation was calculated and compared across the two modes. The findings showed a tendency toward more equal participation in computer mode and revealed some factors which correlated with increased student participation in that mode.

The study also found that students used language which is lexically and syntactically more formal and complex in electronic discussion than they did in face-to-face discussion, thus demonstrating another possible advantage of computer-mediated communication.

Comparing Face-to-Face and Electronic Discussion in the Second Language Classroom

Even before the advent of the personal computer, social scientists were making bold claims about the potential effects on society of new forms of computer-mediated communication. As far back as 1978, Hiltz and Turoff (1978/1993) asserted that computerized conferencing would eventually "have dramatic psychological and sociological impacts on various group communication objects and processes."

In the 1980s, computer conferencing began to be used in academia and the business world, both in its asynchronous form (largely through email discussion lists) and its synchronous form (through real-time discussion on local area networks). Since then, social scientists have examined the psychological and sociological impacts of these new forms of communication.

One of their main findings was a strong equalizing effect of computer-mediated communication. In other words, whereas face-to-face discussions tend to be relatively unbalanced, with one or two participants dominating the floor or determining the topics, computer-mediated communication features more balanced participation, with speakers sharing the floor more equally. Sproull and Kiesler (1991) reviewed six studies that compared the equality of participation in electronic discussion to face-to-face discussion and all six studies showed that electronic discussion was decidedly more balanced.

In addition, they found that it is those who are traditionally at the bottom of the totem pole who benefit most from this increased equality. For example, McGuire, Kiesler, and Siegel (1987) found that women made the first proposal as often as men in electronic discussion, compared to only one-fifth as often in face-to-face discussion. Huff and King (1988) found that topics proposed by lower-status group members were accepted equally in electronic discussion, but were rarely accepted in face-to-face discussion. Sproull and Kiesler found that over time peripheral members of organizations benefited more from the use of electronic mail than did core members of organizations.

Electronic Communication for Teaching Composition

In the 1980s, the use of electronic communication started to become popular in the United States in the teaching of composition. This was based on claims that it (1) provided more writing practice (DiMatteo, 1990; DiMatteo, 1991); (2) encouraged collaborative writing (Barker & Kemp, 1990); and (3) facilitated peer editing (Boiarsky, 1990; Moran, 1991).

In addition, composition teachers also found computer-mediated communication to have the same kind of equalizing effects mentioned above. Flores (1990) and Selfe (1990) report that computer networking served to equalize women's participation in courses they taught. Mabrito (Mabrito, ; 1992) found that students who were more apprehensive about writing tended to benefit most from peer critique conducted electronically. Harman et al. (1991) found that electronic discussion helped less able students increase their amount of communication both with the teacher and with other students.

Electronic Communication in the Second Language Classroom

In the late 1980s, second and foreign language teachers began to integrate electronic communication into language teaching. For teachers of second language writing, the rationale and motivation were largely the same as for their first language counterparts. For teachers of general second language classes, there were a number of additional motivations, including the desire to provide authentic communication partners (Cohen & Miyake, 1986; Paramskas, 1993), the recognition of the importance of cultural exchange (Soh & Soon, 1991), and the desire to teach new learning skills to language minority students (Cummins & Sayers, 1990).

Second and foreign language teachers have also claimed that electronic communication has proved an equalizer in their classrooms. Tella (Tella, 1992) found that Finnish girls, who traditionally have less access to and experience with computers than boys, benefited greatly from their full and equal participation in an international English-language e-mail project. Kelm, citing anecdotal evidence from his own teaching, reports that in his Portuguese classes "computer-assisted classroom discussions are great equalizers" of student participation (1992, p. 443). Kern (in press) compared electronic and face-to-face discussions of the same length in his university French class and found that all students participated in two 50-minute whole class electronic discussion but four did not participate at all, while five tended to dominate, in two 50-minute face-to-face discussions. Sullivan and Pratt (in press) conducted a similar study and found that 50% of the students participated in a whole class face-to-face discussion compared to 100% in a whole class electronic discussion.

Thus evidence suggests that electronic communication can bring about more equal participation among second and foreign language students. However, all of the previously reported studies compared whole class discussion, where it is especially likely that shy students would be afraid to participate. No studies yet have attempted to systematically compare student participation in face-to-face and electronic discussions which take place in small groups, where the patterns of interaction might be different.

Language Complexity

A number of researchers have suggested that electronic communication differs linguistically from both traditional written and spoken discourse (Chun, 1994; Ferrara, Brunner, & Whittemore, 1991; Kern, in press; Murray, 1988; Wang, 1993), and that these differences can be exploited for pedagogical advantage. Chun (1993), for example, contends that electronic discussion is similar to written texts in terms of language complexity, yet resembles face-to-face discussion in terms of functions performed, and thus can serve as an important bridge for transfer of communication skills from the written to spoken domain. Kern (1996) found that students' language electronic discussions in French was more morphosyntactically complex than their face-to-face language. No such study has yet been done with ESL students though.

Research Questions

This study used a controlled experiment to address the following questions regarding student participation and language complexity in face-to-face and electronic discussions:

1. Do second-language students participate more equally in small group discussions held electronically than in those held in a traditional face-to-face manner?

2. If so, who benefits from this more equal participation? In particular, how are differences in participation from a face-to-face mode to an electronic mode related to factors such as gender, nationality, age, and language proficiency?
3. What are students' attitudes toward participating in electronic and face-to-face discussion and how do these attitudes correlate with changes in amount of participation?
4. Does electronic discussion include language which is lexically or syntactically more complex than face-to-face discussion?
5. What other differences are noted in the language use and interaction style in the two modes?

Method

Subjects

The subjects in the study were 16 students out of 20 enrolled in an advanced ESL composition class at a community college in Hawaii. (The other four students were not included because they were absent on the day of the study). The students enrolled in this advanced class on the basis of one of three criteria: (1) an 11.5-12.9 score on the college's general English placement test (indicating 11-12th grade level) with a passing grade on the college's writing sample test, (2) a score of 13.0 (indicating college level reading ability in English) on the Nelson Denney reading test, or (3) a grade of C or better for English 22, a beginning-level writing course.

The students included five Filipinos, five Japanese, four Chinese and two Vietnamese. Two of the students were male and 14 female. The students ranged from 19 to 44 years of age. All had participated in a computer-lab writing class from one-half to one-and-a-half semesters, so they had experience using the InterChange computer program described below. In addition, beginning typing skills were a requirement to enter this section of the course.

Materials

Two audio tape-recorders were used to record face-to-face discussions. Electronic discussions were carried out on IBM personal computers which were situated around the classroom and were facing the walls.

Software used for the electronic discussions was Daedalus InterChange, a real-time communication component of the Daedalus Integrated Writing Environment. Using InterChange, students type their messages on the bottom half of a split screen. When they hit "enter," messages are instantaneously posted (with the name of the writer) on the top half of their own screen and that of everyone else. Messages on the top half are continually posted in chronological order. Users can scroll back and forth to reread previous messages if they wish.

Proficiency levels were assessed using results of the listening comprehension and reading comprehension tests of the Secondary Level English Proficiency Test (SLEP), produced by the Educational Testing Service. As a paper-and-pencil, context-reduced test, the SLEP most likely measures the students' academic language skills in English. The SLEP was administered to all the students by the college approximately two weeks before this research study. Unfortunately, it was not possible to take additional time from the students to administer a more communicatively-oriented test of their listening or speaking ability.

Information about personal background and attitudes was gathered by a non-anonymous survey. Although the lack of anonymity might have decreased students' willingness to answer honestly, this was a necessary decision in order to allow correlations to be calculated between their answers on the survey and their amount of participation.

The survey included six personal information questions (gender, age, native language, birth place, length of residence in the U.S., and number of years studying English) and 19 additional questions answered on a five-point Likert scale. These 19 questions queried students' self-assessment of various abilities--conversing fluently, typing, and using computers--and students' attitudes toward electronic and face-to-face discussion.

Procedures

The study was conducted during a normal 75-minute class-period class period. The 16 students present were randomly assigned to four groups of four students each. Two groups were brought together around separated tables for a face-to-face discussion. Two groups were seated around the room at personal computers for electronic discussion. Using a counterbalanced repeated measures procedure, the groups later changed mode of discussion.

Each group was instructed to discuss two (counterbalanced) questions, one face-to-face and one electronically. The questions, chosen in consultation with the teacher to correspond with the students' current course theme of "the family," were the following:

1. Who should decide basic things about teenagers' lives--what they major in, how they spend their money, who they go out with--the teenagers themselves or their parents?
2. If a husband and wife each work full-time (40 hours a week), how much and what type of housework should the husband do?

Students were given 15 minutes for each discussion. An outside observer with tape-recorder sat in on each face-to-face discussion and made notes as to who said what. It should be mentioned that the students were not accustomed to being recorded, so this may have affected their participation; for example, shy students may have been even more afraid to talk than they normally would be. The classroom teacher sat at her own computer and monitored the electronic discussions, as she usually did. One week later, the classroom teacher administered the surveys to the students during a normal class period.

Analyses

The face-to-face discussions were transcribed and all the transcripts (both face-to-face and electronic) were entered into the Computerized Language Analysis program (CLAN) of the Child Language Data Exchange System (CHILDES), which was used to count the number of words per speaker and to calculate the type-token ratio (see below). The transcripts were then analyzed to calculate the total number of clause coordinations and clause subordinations they contained.

Group comparison. The number of words per speaker was used to calculate the participation percentage per speaker. This was then used to compute the Gini coefficient of participation inequality for each group. The Gini coefficient sums, over all the group members, the deviations of each from equal participation, normalized by the maximum possible value of this deviation (Alker, 1965; Weisband, Schneider, & Connolly, in press). The coefficient thus takes values between 0 and 1, where 0 means perfect equality. For a set of observed participation rates, $X_1, X_2, X_3,$ and X_4 , the Gini coefficient (G) is calculated as $G = 2/3(\text{the sum of } X_i - 1/4)$.

Increased Participation in Computer mode (IPC). All students were assigned an IPC score by subtracting their face-to-face participation percentages from their electronic discussion participation percentages. Students who decreased their participation in computer mode were assigned negative IPC scores. Correlations between students' age, time in the U.S., SLEP scores and IPC scores were analyzed.

While it was the original intention to examine gender as well, on this particular day several male students were absent and there were only 2 male students present out of a total of 16 students. Due to the small number of male students and the great imbalance between male and female students, it was decided that it would not be meaningful to include gender as a variable for analysis.

Student attitudes Mean scores and distributions of survey answers were reviewed to determine which questions students had strong opinions on. In addition, correlations between students' attitudes (as expressed by survey answers) and IPC scores were calculated.

Language complexity Two analyses were made to compare the complexity of the students' output in the two modes (face-to-face and electronic):

1. Type-Token Ratio (TTR), as defined by the total number of different words divided by the total number of words. For example, the sentence, "The boy likes the girl" would have a TTR of .8, because there are four different words divided by five total words. A higher TTR is generally considered to indicate greater complexity. Since TTR varies according to length of passage, excerpts totalling the same amount of total words were taken from the face-to-face and electronic transcripts for this measure.

2. Coordination Index (CI), as defined by the number of independent clause coordinations divided by the total number of combined clauses (independent coordination plus dependent subordination). CI is considered to be inversely proportional to complexity, since more advanced writers or speakers of a language generally use proportionally more subordination than do beginners.

Due to the small number of students involved in the study, statistical results for group comparisons, IPC, and student attitudes were not checked for significance. Any results from these tests should be seen only as indicating trends rather than statistically significant results. Due to the much greater number of total sentences available for comparison, the statistical results for language complexity were checked for significance (at $\alpha < .05$).

Qualitative analysis. Finally, the transcripts were examined to look for qualitative differences in the language use and interaction style in the two modes.

Results

Group Comparisons

Table 1 shows the individual participation percentages of the four groups in face-to-face and electronic mode, as well as the Gini coefficients of participation inequality.

TABLE 1

Percentage of Participation for Each Student
in Face-to-Face Discussion and Electronic Discussion

	<u>Face-to-Face Discussion</u>			
	<u>Group 1</u>	<u>Group 2</u>	<u>Group3</u>	<u>Group 4</u>
Student 1	29.0%	49.6%	48.0%	49.7%
Student 2	27.8%	35.0%	46.1%	37.0%
Student 3	25.9%	14.5%	2.8%	12.7
Student 4	17.2%	0.8%	3.1%	.5
Gini Coefficient	.10	.46	.59	.49

Mean Gini Coefficient for face-to-face discussion=.41

	<u>Electronic Discussion</u>			
	<u>Group 1</u>	<u>Group 2</u>	<u>Group3</u>	<u>Group 4</u>
Student 1	14.9	25.5	27.2	28.5
Student 2	12.2	21.8	42.7	28.9
Student 3	45.5	26.7	10.5	31.3
Student 4	25.5	27.7	19.7	11.3
Gini Coefficient	.30	.05	.26	.18

Mean Gini Coefficient for electronic discussion=.20

Groups two, three, and four all showed greater equality of participation in the electronic discussion. Group one showed the opposite. The Gini coefficients indicate that the electronic discussions as a whole were twice as equal as the face-to-face discussions (= .20 vs. = .41).

Correlations with IPC

Table 2 shows how the IPC (increase in participation in computer mode) is correlated with the SLEP listening score, SLEP reading score, time in U.S. and age. The largest correlation, at .62, is between SLEP listening score and IPC, thus accounting for 38.4% (.622) of the variance.

TABLE 2

Correlations with Increased Participation in Computer Mode (IPC)

SLEP Listening .620

SLEP Reading .214

SLEP Total .499

Age -.042

Time in U.S. -.319

Table 3 shows the average participation for each main nationality in the study for both the face-to-face and electronic discussion. The Filipino students, taken as a whole, decreased their participation in electronic discussion, while the Chinese, Japanese, and Vietnamese student groups each, on the average, increased their participation.

TABLE 3

Average Percentage of Participation by Nationality

	<u>Face-to-Face Discussion</u>	<u>Electronic Discussion</u>
Filipinos (n=5)	41.7%	30.6%
Japanese (n=5)	11.0%	17.0%
Chinese (n=4)	19.9%	22.6%
Vietnamese (n=2)	28.4%	30.2%

(Numbers do not add up to 100% since students were not spread out equally in groups)

Student attitudes

On the whole, the students reported feeling that they could express themselves freely, comfortably, and creatively during electronic discussion, that participating in electronic discussion assisted their thinking ability, and that they did not feel stress during electronic discussion. In fact, in all of these areas, their attitude toward electronic discussion was slightly better on the average than that toward face-to-face communication. In addition, they also found the InterChange program easy to use (see Table 4).

TABLE 4

Student Attitudes Toward Face-to-Face and Electronic Discussion:
Average of Likert-Scale Responses, Maximum=5

	In Face-to-Face Discussion	In Electronic Discussion
I can express myself freely	3.53	3.87
I am comfortable in expressing opinions	3.27	3.93
I can creatively express opinions	3.27	3.60
I feel stress	2.80	1.87
Helps improve my thinking ability	4.00	4.07
The InterChange program is easy to use	n.a.	4.00

A simple regression showed the following three factors correlating significantly with IPC (increased participation in computer mode):

I can converse in English fluently. (negative correlation of .714)

I am comfortable in expressing opinions during face-to-face discussions. (negative correlation of .681)

I can express myself freely during face-to-face discussions. (negative correlation of .662).

Finally, a multiple regression showed that responses to five questions regarding attitude could, when analyzed together, predict nearly all the increased participation in computer mode (see Table 5).

TABLE 5

Correlation of Student Attitude with Increased Participation in Computer Mode (IPC): Multiple Regression Analysis

<u>Survey Question</u>	<u>Total Correlation</u>	<u>Added Correlation</u>
I can converse in English fluently	-.714	
I am [not] comfortable expressing opinions in electronic discussion	-.853	(-).139
Participating in electronic discussions [doesn't] improve my thinking ability	-.897	.(-) .044
I'm comfortable expressing opinions in face-to-face discussions	-.938	(-) .041
I can express myself freely in face-to-face discussions	-.965	(-) .027

Language Complexity

The electronic discussions were compared to the face-to-face discussions on two measures of complexity, one lexical (type-token ratio) and one syntactic (coordination index). On both measures, the electronic discussions involved significantly more complex language than the face-to-face discussions (see Table 7). Differences were especially pronounced in the syntactic area, with 47.5% of the combined clauses in the

face-to-face mode based on coordination (rather than the more complex subordination), compared to just 18.5% of the combined clauses in the electronic mode.

Table 6

Complexity of Language in Face-to-Face and Electronic Discussions

<u>Mode</u>	<u>Type-Token-Ratio</u>	<u>Coordination Index</u>
face-to-face	.262	.475
electronic	.301**	.185**

**Significant difference at $p < .001$.

Qualitative Analysis

A qualitative analysis of the data indicated two important differences in language and interaction between the two groups, one related to turn-taking and one related to formality.

Turn-taking. The conversational mode was marked by numerous short turns with many confirmation checks and active responses. The following was a typical face-to-face exchange of Group 1:

S4: What about you?

S2: Me?

S4: Yeah.

S2: I make my own decision.

S4: Oh, you make your own decision.

S3: Are you living by yourself?

S2: I live with my parents, but...

S3: Oh, yeah.

S4: You are independent.

S3: Independent

S2: I do whatever I want to do.

S1: Oh, yeah?

The electronic exchanges were longer. Sometimes the level of interaction was less direct, with people expressing their own ideas as opposed to directly answering questions. This seemed to be due in part to the fact that more than one person could be writing at the same time. The following is a typical electronic exchange from the same group:

S4: I think both husband and wife should do housework but the husband should pay all bills too

S3: The wife and husband, both work full time so the wife and husband should share the bill evenly. However, the husband can do the heavy work since he has the ability of strength. He could do the house works instead let the wife does.

S2: Most of the people believe housechore is the type of female, but nowadays since male and female are equal. If the husband and wife are full time workers they should share the housechore. If the wife cook then the husband do the dishes. Or perhaps the husband could help the wife the prepared for dinner. In order words, both husband and wife have to shared the housechore. Men will be able to do everything that women do. For example, clean, cook, wash, take care children.

S4: If a working woman want to shift their housework to his husband, how can be fair between men and women.

S1: Based on my experience, the husband do share some of the housework with his wife. Once in a while, he must cook for the entire family and do the clearing of the house. The husband should help in taking care of the children, like taking the child to the doctor when the wife is working. Also, the husband should do once in a while the groceries.

Formality of language. The electronic discussion tended to include more formal expressions, such as "in my opinion", "over all", "based on my experience", "such as," and "therefore" which were virtually absent from the face-to-face discussion. A relatively formal style is seen in this electronic comment made by a Filipino student:

For example, some of the teenagers are saving money to buy their necessities such as the things they need including clothings and some money to spend with their friends. (S10, in electronic communication)

In contrast, face-to-face comments used more informal expressions as seen in the following example from the same student:

Because, like, like, for us, it's like eight of us in a family, you know, so I guess my mum has to take care of all of us. (S10, in oral communication)

A similar contrast is seen in these two comments by a Japanese student, the first taken from her electronic discussion and the second taken from her oral discussion:

I agree with Keiko. When young people graduated high school, basically they can make their own decisions. However they can ask parents about suggest anytime. (S9, in electronic communication).

I'm, so he's not so good. So I do that for him, I did. And he helped me do like Yumiko said, put the garbage out, that kind of stuff. He did. But like paying bills, like we split everything. (S9, in oral communication)

Discussion

First, the study demonstrated a tendency toward more equal participation in computer mode, with three of the four groups substantially more equal in electronic discussion and the overall participation rate twice as equal in electronic discussion as in face-to-face discussion. It is not clear why the fourth group showed no trend toward greater equalization in computer mode but it could be related to the fact that the three groups, unlike the fourth, all included students from Japan, and it was the Japanese students who barely participated in face-to-face discussions but participated much more equally in electronic mode (see discussion below).

Secondly, which factors were correlated with individual increase in participation in computer mode (IPC)? One element that could be viewed as a surprise is that the SLEP listening score was correlated with IPC. One might assume the opposite: that greater listening ability would correlate with increase in participation in the face-to-face mode. This suggests that other factors such as shyness, rather than failure to understand the discussions, might be causing some students to limit discussion in face-to-face mode but participate more equally in electronic mode.

Perhaps most interesting are the tendencies toward unequal participation due to nationality, with Filipino students tending to dominate the face-to-face discussions and the other students, especially the Japanese, speaking much less. One possible reason is that English is one of the national languages in the Philippines

and thus Filipinos have more opportunities for oral practice than most other immigrants. Their greater experience, compared to the other groups, in conversational English may be one reason they tended to dominate the oral discussions. Students of English in Japan, usually get very little oral communication practice, either in the classroom or in society. It is not surprising that they would communicate less in the face-to-face mode and thus register the biggest increase in computer mode.

The differences between Filipino students and the Japanese students could also be influenced by cultural factors. Japanese schools socialize students to listen quietly, rather than to speak up, and Japanese students in the United States often continue this same pattern. It is thus possible that Japanese students choose not to participate in face-to-face discussions but will participate more readily in electronic discussions, which don't involve having to speak out in class.

One more detail on this aspect is worth noting. Four of the five Japanese students made an average of only 1.8% of the comments in their face-to-face discussions; in other words, they were virtually silent. The fifth Japanese student made 48% of the comments in her face-to-face discussion. In fact, this single student made five times as many face-to-face comments as all four other Japanese students combined. It turns out that this student is married to an American and thus probably has had considerably more opportunities for oral practice than the other Japanese students, and perhaps had more socialization in American culture as well.

The student surveys lend support for the hypothesis that lack of oral fluency (or confidence in oral fluency) and discomfort in speaking out are important factors in determining students' relative participation in face-to-face and electronic mode. As noted above, there was high negative correlation between the students' answer to "I can converse in English fluently" with IPC. At the very least one can say that students who think they are not fluent tend to participate more equally in computer mode. Also as noted earlier, this correlation becomes extremely strong when one adds factors such as discomfort in expressing opinions during face-to-face discussions.

Finally, the electronic discussion featured language that was both more formal and more complex than the face-to-face discussion. This is not surprising as this is generally true in the case of written communication. Since this particular study did not include other examples of the students' written texts, a fuller comparison is not possible. Nevertheless, the results do suggest that electronic discussion can be a good environment for fostering use of more formal and complex language, both lexically and syntactically.

At the same time though, the electronic discussion had fewer of the interactional features--such as questioning, recasting, confirmation checks, and paraphrasing--that are often found in face-to-face interaction and which are viewed as important for language learning (Long, in press; Long & Porter, 1985)

Since electronic and face-to-face discussion differ so substantially, they are probably best used with different purposes in mind. Several features of electronic discussion--the longer turns involved, the more equal opportunity for all students to express their ideas, and the fact that electronically-produced texts can be saved for post-hoc review and analysis--suggest that electronic discussion might be used effectively as a prelude to oral discussion. Students could first generate many ideas and then look them over and discuss or debate them orally. In addition, the formality and complexity of language in electronic discussion suggests that it might be an excellent medium for pre-writing work since it could serve as a bridge from spoken interaction to written composition. In other words, face-to-face and electronic discussions could be combined in different ways to highlight the advantages of each.

Conclusion

The findings of this study suggest that electronic discussion may create opportunities for more equal participation in the classroom. Furthermore, this apparently can be achieved without disadvantaging more verbal students. The five most outspoken students in the face-to-face discussions (four Filipinos and one Japanese married to an American) all continued to participate more than 25% of the time in the four-person electronic discussion groups. Thus, while their percent of participation dropped, they still participated more than their share and may have even benefited from the more balanced discussion, since they had more opportunities to listen to others. On the other hand, the four quietest members of the class in face-to-face discussion (all Japanese), increased their participation almost ten-fold (from only 1.8% of comments to a 17.3% of comments) and thus went from almost total silence to relatively equal participation.

At the same time, the more complex and formal language in the electronic discussions was potentially beneficial to all the students, since it may assist them in acquiring more sophisticated communicative skills.

The following are some recommended research studies which might shed more light on the differences between face-to-face and electronic discussion:

1. Studies in which group composition is controlled by nationality (in this study it was not).
2. Studies in which speaking fluency is assessed as a dependent variable (in this study, only written test scores were available).
3. Studies comparing face-to-face and electronic discussion among the whole class or pairs (as opposed to small groups).
4. Studies which measure how participation in both modes might be affected by type of task, for example by including closed tasks (requiring specific solutions) in addition to the relatively unstructured tasks that were part of this study.
5. Studies which evaluate certain sequences of activities, for example electronic discussion followed by face-to-face discussion as compared to the other way around.

Learning more specifics about how electronic discussion differs from face-to-face discussion can help language teachers make informed decisions about how, when, and to what purposes to use these two modes of communication in the classroom.

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