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Online peer conferencing in academic writing

Jung-Ts Lin

TESOL Graduate Institute,
National Chiao Tung University, Taiwan
jungts@hawaii.edu

Chih-Hua Kuo

TESOL Graduate Institute,
National Chiao Tung University, Taiwan
chhkuo@mail.nctu.edu.tw

*Computer-assisted language learning (**CALL**) has been used in language education in various forms to facilitate classroom interaction, provide language scaffolding, or promote learning autonomy. The present study explored how peer conferencing through synchronous computer-mediated communication (**SCMC**) can serve as a pre-writing consciousness-raising activity for learning the rhetorical structure of research articles. Participants were 13 **TESOL** graduate students in an **EAP** course. Their text-based interactions were saved and analyzed in terms of turn-taking and meaning negotiation. A questionnaire was also administered to access students' attitudes towards online discussion. Results showed that advanced **EAP** students were goal-oriented and closely collaborated with each other in the process of online discussion.*

Introduction

With rapid advances in computer and web technologies, computer-mediated communication (**CMC**) has been adopted for classroom discussion in various language learning contexts. **CMC** seems to have an impact on language learning mainly through collaborative learning. Students discussing through **CMC** can think, reflect, and revise ideas by interacting with others. The conversations in the learning process are considered to be supportive dialogues, leading learners to negotiation of meaning, modified input and output, and acquisition of knowledge (Berge & Collin, 1995; Warschauer, 1997). Studies have revealed that with scaffolding provided by software argumentation templates, students could develop their argumentation skills and

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critical reasoning (Cho & Jonassen, 2002; Saye & Brush, 2002; Yeh & She, 2010). Moreover, learners initiate more new topics or elaborate better on an existing topic when compared with those in traditional classrooms (Chun, 1994). Classroom discussions facilitated by computers can motivate marginalized students to become more willing to express their thoughts since CMC provides a friendly context in which they can avoid or mitigate embarrassing face-to-face criticism and disagreement (Bump, 1990). These results are consistent with Vygotsky's zone of proximal development (ZPD) (1978), which holds that collaborative learning tasks can facilitate learners to improve their abilities by cooperating with teachers or other advanced learners. In comparison with face-to-face interactions, collaborative tasks in CMC can facilitate learners to make use of their ZPD through knowledge co-construction (Ohta, 2000; Swain, 2000).

Features of synchronous computer-mediated communication

Synchronous CMC (SCMC) is one type of CMC. It allows users to discuss with each other online in real time. The application of SCMC to language learning is based on the socio-cognitive approach, which highlights the importance of social construction for language learning (Hymes, 1972). The purpose of language learning in SCMC focuses on meaning negotiation and knowledge co-construction. Chun (1994) found that in synchronous CMC discussion, students tend to be more involved in the discussion by asking questions and giving feedback to their peers. In terms of synchronicity, SCMC is similar to face-to-face discussion. However, in SCMC, as a result of physical absence, discussants tend to emulate the facial expressions and prosodic features in face-to-face communication in order to convey their feelings (Werry, 1996). They utilize writing conventions like capitalization and punctuation marks, such as WHAT? or I like it!!!, to mimic intonation, stress, exclamation, etc. Moreover, they also create vivid icons to show their emotions such as ^^ (smile) and > < (anger). In other words, non-verbal cues in written forms are characteristic of SCMC.

Crystal (2001) indicated that in synchronous CMC the distinctive feature of overlapping in speaking makes new participants more circumspect when they decide to join in the ongoing conversation. In addition, new participants have to adopt specific conversational strategies or conform to the expectations of the group, or they may be excluded. In response to the rapid flow of information exchange, participants tend to produce simple sentences or sentence fragments. A sentence is usually simplified by the use of abbreviations (e.g. msg = message) and colloquial elisions (e.g. r = are) as well as the omission of internal sentence punctuations, final periods, apostrophes from contracted forms, and auxiliary verbs.

Werry (1996) investigated the textual features of Internet relay chat (IRC), a type of online chat room, discovering that the electronic language was similar to oral language in terms of abbreviations, paralinguistic and prosodic cues, and gestures. The participants tended to shorten their sentences in response to the rapid flow of communication, so the maximum of six words was appropriate in an entry to express meaning and attract others' attention. Syntactically reduced forms were extensively used, including subject pronoun deletion, auxiliary omission, acronyms and symbols (e.g. <ariadnne> ← is fine…. The arrow referred back to the speaker "ariadnne"), and reduction in phonology (e.g. cya=see you). The use of capitalization, spelling, and punctuation was sometimes purposeful to imitate the voice and tone in oral language. Asterisks enclosing a string of words and graphical icons were used to illustrate the nonverbal signals that were absent in CMC. These features

indicate that synchronous CMC reflects many similar communicative features to informal speeches.

From the discussion above, we know that synchronous CMC is relatively colloquial and full of nonstandard usage. Although these distinctive features vary to a certain extent in different communities, they are considered the marks of group identity (Crystal, 2001).

Turn-taking and meaning negotiation in SCMC

Sotillo (2000) found that the discourse functions of SCMC and face-to-face communication are similar regarding the types and quantities. Lin (2008) found that MSN discussion not only contained many speaker changes and unintentional overlaps but had a high frequency of meaning negotiation as well. Yeh and She (2010) found that students, with training in argumentation skills via synchronous CMC, performed well in an achievement test, a conceptual change test, and a dependent argumentation test. Through negotiation of meaning, namely claim, warrant, backing, and rebuttal in their study, students acquired scientific knowledge during the process of group discussion. The use of online communication collapses the far-reaching IRF (Initiation, Response, and Follow-up) sequence in traditional classrooms. IRF sequence refers to the process in which the teacher initiates students' learning, followed by the student's response to the teacher's elicitation, and the teacher's "follow up" when (s)he evaluates the response (Mahan, 1985). Electronic discussion, in contrast, reduces teachers' interference and enhances collaboration between or among students. The text-based communication may also serve as a "thinking device" (Lotman, 1988; Wertsh & Bivens 1992) to help students reflect over the text of their communication after they collaboratively interweave the electronic discourse.

Many studies have investigated the use of CMC in English classes targeting general English; however, little research has explored the effects of online peer conferencing on the acquisition of genre knowledge. Therefore, the present study attempts to investigate how advanced EAP students may acquire genre knowledge via online discussion. Online discussion on the move structure of research articles (RAs) provides necessary interactions for advanced EAP learners to become aware of the communicative purposes and rhetorical structure of this genre, which in turn may help learners acquire genre knowledge and EAP writing ability. The research questions of the present study are formulated as follows:

1. Can advanced EAP learners acquire genre knowledge by working collaboratively in online peer conferencing?
2. How do advanced EAP learners take turns and negotiate meanings in online peer conferencing?
3. What are advanced EAP learners' attitudes towards online peer conferencing?

Methods

Participants

The participants were 13 graduate students in an MA TESOL program. Since they had to pass a very stringent entrance examination in English to enroll in the master program, they were considered advanced English learners. They ranged in age from 23 to 27 years old and spoke Chinese as their mother tongue. At the time of the study, they were preparing to write their theses, so they took an academic writing course aiming at the organization

and style of theses and research articles as well as pertinent academic writing skills. For the purpose of this study, the 13 students were paired into five dyads plus one group consisting of three students. The textbook used in the course was *Academic writing for graduate students: Essential tasks and skills* by Swales and Feak (2004), supplemented with a course package containing journal articles on the rhetorical structure and language use of the major sections of RAs or chapters of theses.

Instruments

The main instrument employed in the present study was a self-developed online writing system (Kuo, 2008). The system was aimed to provide a supportive writing environment which integrates various writing resources and tools into the immediate writing context. In the present study, Online Discussion of the system was used to collect data for addressing the research questions. Online Discussion was designed for online peer conferencing in order to promote brainstorming and peer interactions before writing. Participants were expected to develop a sense of how to engage in active collaboration. This component of the system is composed of three frames. The upper left frame presents the text selected for online discussion, helping the participants to refer back to the text more easily in the process of discussion; below this frame is the input frame where the participants key in their ideas; the right frame shows the complete conversation of the dyad/group, providing the participants the opportunity to review what they have talked about to facilitate discussion. Another instrument was the questionnaire, based on Gallupe, Bastianutti, and Cooper (1991). Their questionnaire was modified to focus on the perceived ease, effectiveness, and preference of using online discussion for the purpose of learning academic writing. The modified questionnaire consists of ten 5-point Likert scale questions to access students' attitudes towards online discussion.

Task and procedure

Online peer conferencing was conducted in class after the rhetorical structure of introductions in RAs was taught based on Swales and Feak (2004). The discussion task required the participants to practice analyzing the rhetorical structure of the Introduction section of a research article uploaded and shown in the upper left frame of the system, as mentioned earlier. The article was taken from a prestigious journal in the participants' discipline. The participants were divided into dyads and one group of three. They discussed online to identify the move structure of the text exemplar. The online discussion started as any participant of the dyad/group made the first submission of input and lasted 20 minutes. After the task, the participants were given the questionnaire inquiring their perceptions of using Online Discussion.

Data collection and data analysis

Data collected included the online discussion text and the questionnaire. The questionnaire contains ten 5-point Likert scale questions. Each question was analyzed by means of its mean score and standard deviation so that we could understand the students' inclination to the use of online peer conferencing. Cronbach's alpha was used to examine the reliability of the questions in the questionnaire. Principal component analysis (PCA) with varimax

rotation was used to analyze the factors related to the students' attitudes towards online peer conferencing. The discussion texts of the dyads or group were automatically saved in the database of the online writing system. The data of the participants' online discussion were analyzed to examine the interaction process in which the students were expected to acquire genre knowledge and to find how they took turns and negotiated meanings in online conferencing. The Rainbow Method (Baker et al., 2002, as cited in Laurinen and Marttunen, 2007) and collaborative and non-collaborative speech acts (Laurinen and Marttunen, 2007) were used for analysis. The two methods had been used in Laurinen and Marttunen's analysis (2007) of students' argumentative interaction. Given the nature of argumentation in the given task, we believed that it was proper to employ the same framework for analysis.

The Rainbow Method. The Rainbow Method was proposed by Baker et al. (2002, as cited in Laurinen and Marttunen, 2007). It was used to analyze argumentative interactions between students. The method consists of seven categories as follows:

1. Explore and deepen: interactions involving counterarguments, argumentative relations and meanings, and any discursive or conceptual deepening of arguments
2. Argumentation: arguments and counterarguments directly related to the task for the purpose of arguing or counter-arguing with others
3. Opinions: opinions stated, requested, or clarified with respect to the topic of the task
4. Task management: management of the progression of the argumentative task
5. Interaction management: interactions managing the communication between discussants
6. Social relations: interactions managing the students' social relations
7. Outside activity: interactions not related to the topic of the given task

Collaborative and non-collaborative speech acts. Further analysis of the participants' speech acts was based on Laurinen and Marttunen's framework (2007) which includes eight categories. The first six categories are collaborative speech acts and the last two are non-collaborative, as explained below:

1. Questions, requests for clarifications and provocative claims: questions and statements presented when one member of the dyad wants to obtain more information about the topic
2. Answering direct questions and responding to issues presented by the interlocutor: counterarguments rebutting the opinion of one's interlocutor, or elaborations of the topic in question, clarifications, and explications
3. Maintaining collaborative discussion: statements indicating that the students monitor their interlocutor's attention and control the flow of discussion with short indirect or direct suggestions
4. Extending thoughts presented by the interlocutor: efforts to further extend and develop the interlocutor's ideas
5. Recapitulations and summaries: statements recapitulating and summarizing previous discussions and conclusions
6. Short positive feedback: acknowledgement showing one is listening to one's interlocutor and has understood the speech turns presented previously
7. Continuing one's own ideas: ignorance of the other speaker's preceding utterance and continuation of one's own ideas

8. Unconnected comments and attempts to change the topic: change of the discussion topic

For all the categories, the frequencies in total and for each person and standard deviation were examined to give a picture of how the participants interacted or collaborated with each other during the online discussion.

Conversation analysis. Turn-taking and meaning negotiation were analyzed by means of Coulthard's framework (1977). The framework of turn-taking includes how speakers obtain, keep, and yield the floor. The current speaker may yield the floor by creating an adjacency pair, such as greetings, closings, questions, etc. If s/he wants to keep the current floor, s/he may use connectors (i.e. *but* and *however*) and subordinators (i.e. *if* and *since*) to show the incompletion of the utterance. As for the potential next speaker, s/he can obtain the floor by judging the point of possible completion of the utterance. One of the strategies s/he may use is to determine the grammatical completion of the utterance. The analysis of meaning negotiation focuses on how interlocutors manage to understand their partners' words and the role that emoticons play in comprehending the online discussion discourse. The ways of meaning negotiation may include explicitly asking for clarification, repeating the confusing part in texts, asking the interlocutor to explain more or to give examples, and using vocalization to show puzzlement.

Results

Argumentative interactions in online discussion

Table 1 shows the frequencies of the seven categories in the Rainbow Method, the average production of each participant, and the standard deviation in the students' online peer conferencing. *Opinions* occurred most frequently whereas *Explore and deepen* had a very low frequency, only higher than *Social relations*. This suggests that the participants were actively engaged in the discussion but did not discuss in depth. For example, in identifying a move in the text, most students merely indicated where they thought the move is located without discussing the rhetorical function of the move in the specific context or specific phraseology that is characteristic of the move. During the 20-minute online discussion, each student expressed his/her opinion around 25 times, reflecting their active involvement in online discussion.

Table 1: Analysis of argumentative interactions in the online discussion

Category	Frequency	Average	Standard Deviation
Explore and deepen	17	1.31	1.32
Argumentation	37	2.85	3.31
Opinions	163	12.54	12.83
Task management	42	3.23	3.35
Interaction management	38	2.92	4.19
Social relations	15	1.15	0.99
Outside activity	21	1.62	3.07
Total	333	25.62	

Argumentation, however, has a frequency far lower than *Opinion*s. This suggests that students frequently expressed their own opinions rather than argued or counter-argued with their peers when doing the move analysis task via online discussion. On average, each student used *Argumentation* not more than three times in the whole online discussion process.

Interaction management and *Task management*, as shown in Table 1, had similar frequencies. These two categories reflect efforts to facilitate interactions between the discussants and to smooth the progression of the online discussion, both of which help structuring the discussion discourse. *Social relations* and *Outside activity* rarely occurred in the online discussion, with the former occurring only approximately one time per person. Since the move analysis task was constrained by time, students might focus more on completing the task rather than managing social relations. The low frequency of *Outside activity* suggests that the participants could control and concentrate their discussion on the target task.

The analysis of collaborative and non-collaborative speech acts further uncovers the process of online interactions. Table 2 presents the occurrences of students' various speech acts. The proportion of collaborative versus non-collaborative speech acts was approximately 80% to 20%, showing intensive collaboration among students.

Table 2: Speech acts of collaboration and non-collaboration

Category	Frequency		Average	Standard Deviation
Questions, requests for clarification and provocative claims	79	(25%)	6.08	7.42
Answering direct questions and responding to issues presented by the interlocutor	70	(23%)	5.38	5.33
Maintaining collaborative discussion	30	(10%)	2.31	3.77
Extending thoughts presented by the interlocutor	17	(5%)	1.31	1.32
Recapitulations and summaries	9	(3%)	0.69	1.38
Short positive feedback	45	(15%)	3.46	3.95
Subtotal	250	(81%)		
Continuing one's own ideas	35	(11%)	2.69	3.57
Unconnected comments and attempts to change the topic	25	(8%)	1.92	1.61
Subtotal	60	(19%)		
Total	310	(100%)		

With respect to individual speech acts, *Questions, requests for clarifications and provocative claims* and *Answering direct questions and responding to issues presented by the interlocutor* occurred most frequently, accounting for nearly 50% of the occurrences of all speech acts. However, *Recapitulations and summaries* and *Extending thoughts presented by the interlocutor* had low frequencies, 3% and 5%, respectively. The results show that the participants tended to collaborate with each other by directly responding to their interlocutors but did not explore and deepen the discussion by extending others' thoughts. On the way to achieve learning goals, the participants devoted themselves to maintaining the discussion and giving short positive feedback. However, they seldom recapitulated and summarized the discussion. This is probably due to the time constraint of the discussion. On the other hand, the two non-collaborative speech acts, *Continuing one's own ideas* and *Unconnected*

comments and attempts to change the topic, had moderately high frequencies, constituting 11% and 8%, respectively. Time lag and the lack of facial cues might make the participants focus on expressing their own ideas and neglecting their partners' comments. They often anxiously expressed their ideas or delivered new information to their partners without waiting patiently for their partners' comments. For instance,

> [Argument] A: but doesn't that part reviews what has been done before and indicates the gap? The subject of "...detailed analysis" is "different types of academic work"
>
> [Attempt to change the topic] B: I think the second paragraph to the tenth paragraph is doing literature review on **CARS** model

In the above example, while student A was still arguing about the moves in paragraph one, student B started abruptly to discuss the moves in paragraph two without responding to student A's question and without indicating the wish to change the topic as well.

Strategies of turn-taking and meaning negotiation

Turn-taking in the online discussion seldom showed overlaps; instead, good collaboration was found. For example, the current speaker signaled the wish to make speaker change by creating part of an adjacency pair, and his/her partner found the point of possible completion of the current utterance when a grammatically complete sentence was used by the current speaker. This seems to indicate that the interlocutors were familiar with online chat and knew how to make use of it in a productive way. An adjacency pair may consist of asking a question and answering it, or greeting and response to the greeting. Examples are given as follows:

> [Asking a question] A: Can you infer the gap from other words or lines?
> [Answering the question] B: Yes. It is on page 27.
>
> [Greeting] A: Hello, how are you today?
> [Response to the greeting] B: So so.

Most dyads did not end the discussion by producing closings. This is probably because the students did not pay attention to the passing of time, so that they could not formally close the discussion when the time was up. However, most of them greeted each other at the very beginning, which was a signal to show friendliness to their partner and to start the discussion.

Meaning negotiation caused by unclear utterances was rare in the online discussion. Its low frequency may be attributed to students' advanced language proficiency and the frequent use of task management and interaction management. Examples of task management and meaning negotiation are shown below:

> [Task management]
> A: Do you think the four lines refer to the gap for the study?
> B: Maybe we can move on to the next few lines and then decide the range of indicating the gap.
> A: Good idea!

[Meaning negotiation]
A: Can you infer the gap from other words or lines?
B: Wait a sex.
A: Sex?
B: Sec.

In the second example above, the confusion was actually caused by misspelling, equivalent to tongue slip occurring in face-to-face communication. Meaning clarification was conducted by repeating the confusing part. Moreover, the use of emoticons helped students express their feelings and emotions in the online discussion, such as @@ (dizziness), ^_^ (smile), and = = (unhappiness). For example,

A: Sorry, I can't find the move in this paragraph = =.
B: No problem. Let me see ^_^.

Attitudes towards online discussion

Cronbach's alpha of the questionnaire is .74. It shows that the questionnaire is moderately reliable. Principal component analysis (PCA) was then conducted. The central idea of principal component analysis (PCA) is to reduce the dimensionality of a data set consisting of a large number of interrelated variables, while retaining as much as possible of the variation present in the data set (Jolliffe, 2002). Table 3 presents the results of PCA. It revealed that three factors contribute to most of the variance in students' attitudes towards the use of online discussion. Factor 1 explains Questions 8, 2, 4, 7, 3, and 6. In other words, six variables, as represented by the six questions including the perceived ease of understanding others' ideas, negotiating meaning, and discussing in depth, and the effectiveness of discussing the moves and steps, raising consciousness, and learning to write Introduction, are related to each other. In the same manner, factor 2 identified can explain Questions 5 and 9. The finding means that the perceived ease of discussing in English online is related to the fondness for using online peer conferencing. Questions 1 and 10 can be well explained by factor 3. The finding means that the perceived ease of expressing ideas online is related to the preference of online discussion to face-to-face discussion on a writing task. Questions 1, 3, and 6 are complex variables because each of them has two loadings that score above .40. These questions thus need either revising or discarding. According to the concepts underpinning the variables (that is, the questions), factor 1 can be named online discussion and genre knowledge, factor 2 can be named online discussion and academic writing, and factor 3 can be named medium of communication and idea expression. Among the three factors, factor 1 accounts for most of the variance (48.2%) of the students' attitudes towards online discussion, while factor 3 explains least of the variance (13.2%). The three factors together can explain 79% of the total variance, leaving 21% as the unique variance. In other words, there are other factors which are specific to individual questions and explain the students' attitudes towards online discussion.

Table 3: Principal component analysis of the questionnaire of attitudes

Variables	**Rotated PCA Eigenvalues ≥ 1.00**			h^2
	Factor 1	**Factor 2**	**Factor 3**	
Question 8	**0.932***	0.220	0.005	0.918
Question 2	**0.899***	0.000	0.018	0.808
Question 4	**0.814***	0.316	0.009	0.763
Question 7	**0.677***	–0.155	–0.010	0.483
Question 3	**0.662***	0.605*	0.020	0.805
Question 6	**0.613***	0.573*	0.081	0.711
Question 9	–0.267	**0.882***	0.058	0.853
Question 5	0.273	**0.850***	–0.092	0.806
Question 10	0.268	0.171	**0.896***	0.904
Question 1	0.482*	0.354	**–0.711***	0.863
Proportion of variance	0.482	0.176	0.132	0.790

* = Loadings over .40; bold-face type = highest loading for each variable.

Table 4 shows the mean score and standard deviation of each item. It is interesting to note that Question 7 (How effective was the online discussion to raise your consciousness of the moves and steps in Introduction?) has the highest mean score while Question 6 (How effective was the online discussion to discuss the moves and steps in Introduction?) has the lowest. This suggests that the students perceived that online discussion may be more effective in raising their consciousness of the move structure of the Introduction section than as a medium to discuss moves and steps. There are some possible reasons for this result. Discussing with peers forced the students to review and apply the acquired knowledge about moves and steps to the analysis task, reinforcing their genre knowledge. Therefore, students thought online discussion was effective to raise their consciousness of moves and steps. However, the move analysis that the students were required to do was itself challenging, involving real-time academic reading and the genre knowledge they just learned. Therefore, they might encounter difficulty discussing the related concepts online. The fact that Question 5 (How easy did you feel it was to discuss an issue in English in the online discussion?) has a much higher mean score than Question 4 (How easy did you feel it was to discuss a question in depth in the online discussion?) reveals that discussing a question in depth online should be much more difficult than carrying on a general discussion online, even for advanced **EAP** students. Since Question 3 (How easy did you feel it was to negotiate meaning in the online discussion?) also has a much higher mean score than Question 4, it seems meaning negotiation in online discussion was not perceived so difficult as discussing a question in depth by these students. Concerning other aspects of online discussion, students felt it easier to understand others' ideas (Question 2) than express their own ideas (Question 1). Furthermore, the students' attitudes towards the use of online discussion as a pre-writing activity were on the positive side (Question 9). They might think that it can facilitate the learning of writing Introduction (Question 8). Nevertheless, the mean score for Question 10 is not high, suggesting that the students did not strongly prefer online discussion to face-to-face discussion on a writing task.

Table 4: Analysis of the questionnaire of attitudes

Question	Mean Score	Standard Deviation
1	3.17	0.83
2	3.50	1.17
3	3.25	0.97
4	2.67	1.23
5	3.58	1.08
6	2.58	1.00
7	3.75	1.06
8	3.25	0.97
9	3.33	0.98
10	2.83	1.19

Discussion and conclusion

The results of this study show that in online discussion, the advanced **EAP** students are able to express ideas and arguments related to the topic and develop strategies to facilitate interactions and smoothen the progression of discussion. In addition, they are highly collaborative in managing the task by directly responding to their partner's questions and requests. This is consistent with Chun (1994), who found that students in **SCMC** are involved in the discussion by asking questions and giving feedback to their peers. The ability of giving feedback is considered one of the benefits that students can get by communicating via **CMC** (Chun, 1994).

The fact that the participants in this study have few overlaps during the discussion also suggests that the online discussion of the advanced students is similar to face-to-face interaction (Black, *et al.*, 1983) and that misunderstanding and confusion about the other's utterances are reduced. This result is different from our previous study (Lin, 2008) in which overlaps occurred quite often and non-interactive discourse threads were created in non-English major undergraduates' online discussion. One of the possible reasons to account for such differences may be the discrepancy between the English language proficiency of the participants in the two studies. This implies that peer conferencing online in which teachers seldom interfere may be more suitable to students with higher language proficiency. Additionally, the goal-oriented nature of the task in this study may contribute to fewer overlaps and negotiation of meaning in online discussion. Therefore, pedagogically, the design of the task for online discussion can be crucial to its effectiveness.

It is also observed that the participants in this study seem to follow closely the electronic etiquette by scarcely interrupting the other interlocutor's utterances. They are able to convey their thoughts with more accurate words and phrases and describe their ideas more clearly, so that fewer misunderstandings of meanings are caused. These results are consistent with the results of the survey which show that the advanced students feel it easy to discuss in English.

Although the present study is limited in terms of its small sample size, the findings are meaningful in several ways. They show that collaborative learning is more likely to be successful with students who have high-level language proficiency since they can precisely express their thoughts and understand their interlocutor's words without much difficulty.

They do not have to make much effort and spend much time in meaning negotiation during the discussion; as a result, they can focus more on the topic or task. Moreover, most students agree that online discussion is an effective way to raise their awareness of the moves of a genre. Nevertheless, even advanced students may find it difficult to discuss a question in depth in the online situation. Therefore, the pedagogical implication is that teachers may need to find effective ways to enable students to discuss a topic in depth, such as by providing topic-related information, types of argumentation, or strategies for meaning negotiation. Moreover, online discussion is a good tool to boost collaborative learning. As a pre-writing activity, it may help students raise their consciousness of the generic structure of a genre. Therefore, **EAP** teachers can design consciousness-raising tasks for online discussion so as to give students the opportunity to acquire specific **EAP** knowledge. In the argumentative interaction, there is little evidence that subjects engaged in explore and deepen as well as recapitulations and summaries, so before the pre-writing activity, the teacher can train students in how to develop their argumentation based on the categories. For future research, given that all the factors did not explain well why online discussion raises students' consciousness, it would be of interest to know what other factors contribute to it. A more qualitative approach can be taken; for example, we can interview students or use think-aloud protocols to explore both the process and effects of different types of online interactions. A combination of quantitative and qualitative approaches might yield very interesting and highly relevant results on this topic.

Finally, with increasing popularity of online discussion in education, this study explores online peer conferencing as a type of pre-writing activity for learning the rhetorical structure of research articles. The results show the collaborative and non-collaborative speech acts of the advanced **EAP** students and their strategies of turn taking and meaning negotiation in online discussion; the questionnaire survey also reveals students' attitudes towards online discussion.

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Appendix A

Online writing system

Figure 1. A screen-shot of the online writing website

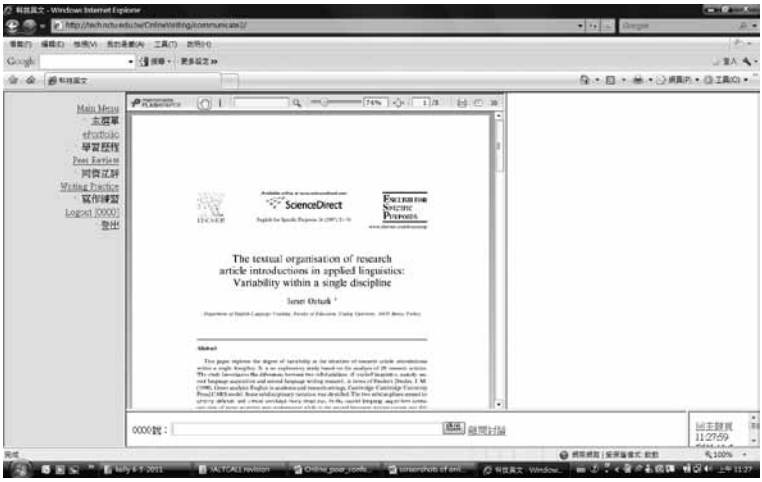

Figure 2. A screen-shot of the online discussion interface

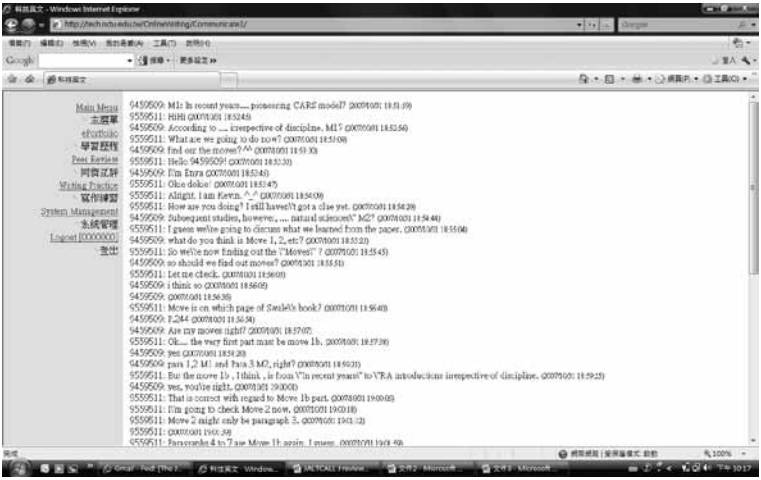

Figure 3. A screen shot of the discussion data of a dyad of participants

Appendix B

Questionnaire

Question	1	2	3	4	5
How easy did you feel it was to express ideas in the online discussion? 1=not easy at all, 5=very easy					
How easy did you feel it was to understand the ideas your partner expressed in the online discussion? 1=not easy at all, 5=very easy					
How easy did you feel it was to negotiate meaning in the online discussion? 1=not easy at all, 5=very easy					
How easy did you feel it was to discuss a question in depth in the online discussion? 1=not easy at all, 5=very easy					
How easy did you feel it was to discuss an issue in English in the online discussion? 1=not easy at all, 5=very easy					
How effective was the online discussion to discuss the moves and steps in Introduction? 1=not effective at all, 5=very effective					
How effective was the online discussion to raise your consciousness of the moves and steps in Introduction? 1=not effective at all, 5=very effective					

Question	1	2	3	4	5
How effective was the online discussion to help you learn how to write Introduction? 1=not effective at all, 5=very effective					
Do you like to use online discussion as peer conferencing before you write an assignment? 1=not at all, 5=very much					
Do you prefer online discussion to face-to-face discussion on a writing task? 1=not at all, 5=very much					

Author biodata

Jung-Ts Lin is currently a PhD student in the Department of Second Language Studies at the University of Hawaii. Her research interest focuses on the incorporation of technology into language learning.

Chih-Hua Kuo is a retired professor from the Institute of TESOL at National Chiao Tung University, Taiwan. She has published research articles in *English for Specific Purposes, IEEE Transactions on Professional Communication, RELC Journal*, etc. Her primary research interests include EST/EAP, discourse analysis, and corpus-based studies.