課程與教學季刊　2010, 13(1), 頁 173～208

網路同儕互評應用於大學英文寫作課之個案研究

劉顯親

近二十年來，由於體認到寫作雖是個人之活動但目的卻爲表情達意之雙向溝通，傳統英文寫作課程因此常使用同儕互評等溝通性之課堂活動。隨著網路通訊普及與其伴隨之加乘效果，同儕互評活動以嶄新之網路版風貌出現而受到老師重視。然而，目前針對此議題之實證研究仍不多見，不足以了解網路同儕互評對學生線上討論、態度、及作文修改之影響。此個案呈現一群大學生使用網路評閱系統以修改英文作文過程；此系統除具備文件管理及線上聊天功能，也整合中英關鍵字索引及搭配詞兩項檢索工具以提供學生用詞協助。評估學生使用表現含連接詞測驗、一篇作文、及評量問卷；此外，學生學習過程資料（三篇作文）如討論記錄、採納同儕建議程度、以及作文修改情況也納入分析。研究發現此線上同儕互評能輔助學生寫作及單字表現，學生對此網路學習環境滿意度呈中上，對關鍵字索引及搭配詞檢索滿意度略高於其它功能。本文貢獻在於：在大學生英文寫作課上使用網路同儕互評活動情境下，針對學生感受、文本、及寫作過程等三重要面向，提供深入了解。

關鍵字：同儕互評、中英關鍵字索引、搭配詞、連接詞、網路學習環境

作者現職：國立清華大學外國語文系教授

1. Introduction

Peer review (also termed as peer response) has become commonplace in second language (L2) writing classrooms, as the activity promises to foster meaning negotiation and construction, to enable L2 learners to test out their original ideas, to prompt themselves to revise old hypotheses, and to develop new perspectives on the writing (Ferris, 2003; Liu & Hansen, 2002). Some existing literature and pedagogical arguments generally support the advantages of peer review as it has been shown to help student-writers to develop critical thinking, improve writing quality, and enhance writing confidence (e.g., Liu & Hansen, 2002; Nelson & Carson, 1998; Nelson & Murphy, 1992). Over the past twenty years, a great number of peer review studies have yielded useful information; however, answers about specific issues associated with the effects of peer review on L2 writing have not been conclusive and there is clearly a need for further investigation (Ferris, 2003; Hyland & Hyland, 2006).

For instance, students' prior educational experiences and their first language culture may prevent them from providing or adopting peer feedback readily. Carson and Nelson (1996) found that their Chinese students showed reluctance to initiate comments and disliked criticizing peers' work, as they were afraid of losing face under the influence of cultural collectivism. Recently, Miao, Badger, and Zhen (2006) found that their Chinese students provided peer feedback but generally liked teacher feedback more. Due to more opportunities for meaning negotiation, peer feedback led to more successful revisions, perhaps being understood more. They thus argue that when teacher feedback is not readily nor frequently available in the writing class due to the large class size (e.g., in China as the site of their research), peer feedback can be a valuable source as it may foster learner autonomy. They call for further research on possible factors on Chinese students' adoption of peer feedback. Lai and Chung (2005) conducted peer review on thirty-nine senior high students in Taiwan and found that learners of different English levels commented upon and revised their writing differently but their attitudes toward peer review became less distinctive after the activity, both endorsing the benefits of peer review.

The account above suggests that at least students' factors (among others) can vary the value of adopting peer feedback for writing instruction. Hyland and Hyland (2006) caution that we should avoid idealizing the practice of L2 peer response group. Similarly, based on an extensive review, Ferris (2003) points out a number of

issues to consider when evaluating the impact of peer feedback: student revision and writing improvement, student attitudes (such as cultural differences and attendant expectations), and peer interaction. She points up important gaps: "the most critical need for future peer feedback research is for multifeatured, triangulated projects that simultaneously consider peer feedback characteristics and outcomes" (Ferris, 2003, p. 85).

1.1 Moving from Classroom-based Peer Review to Online Peer Review

As Internet technologies become widely used today, peer review has been reinvigorated with the enhancement of electronic communication. With similar advantages of conventional face-to-face peer review, virtual peer response adopts additional strengths of computer technology by allowing students working at any time and at any location with record-keeping of all comments from online discussion and text changes. The record-keeping function facilitates student reflection and (teacher- or self-) monitoring of the idea exchanges and revising actions (Tuzi, 2004). Thus, virtual peer review has the potential to bring significant impact on writing in the workplace, writing pedagogy, online writing centers, and writing-across-the- curriculum (Breuch, 2004), particularly in an era when increasing numbers of people go online for work and study. Adopting the notion "remediation" (Bolter & Grusin, 1999), Breuch (2004) argues that virtual peer review can be regarded as a remediation of face-to-face peer review through technology as it refashions "stark differences between older and newer media" (p. 8). The online mode emphasizes written (than oral) communication and can be shaped differently as a function of time, space and interaction in Internet environments (Bloch, 2004). Depending on their instructional objectives, writing instructors may adopt either asynchronous or synchronous online technologies for different types of peer response. Breuch (2004) suggests that synchronous technologies may be more useful for brainstorming or quick feedback to specific queries, whereas asynchronous technologies may assist substantive, detailed, and summative commentary or evaluation better. These positions require empirical studies to validate although they sound intuitively correct.

Although a large amount of research has been conducted on the efficacy of peer response in the traditional mode with both supportive findings and caveats for L2 writing (e.g., Connor & Asenavage, 1994; Jacobs, Curtis, Braine, & Huang, 1998; Leki, 1990; Lockhart & Ng, 1995; Mangelsdorf & Schlumberger, 1992; Mendonça

& Johnson, 1994; Miao, Badger, & Zhen, 2006; Min, 2006; Villamil & de Guerrero, 1996; Zhang, 1999), only a few studies have dealt with computer-mediated peer response (Ware & Warschauer, 2006). Negative results were found in some earlier empirical studies[1]; however, a different picture with mixed findings is shown recently. Ware and Warschauer (2006) point out that students' familiarity with technology plays a key role in the success of pedagogical integration. Additionally, as most instructional activities are locally influenced, matching of learning goals and media is crucial for successful technology adoption (e.g. Breuch, 2004; Hewett, 2000; Ware & Warschauer, 2006).

Honeycutt (2001) compared online peer response activities conducted between an e-mail context and a synchronous chat setting by seventy-three ESL students. He found that the quality of student revisions using e-mail was better than those using synchronous conferencing, which was partly attributed to its document-related referencing and associated specific comments. Document referencing may allow deeper processing of student texts as accessible concrete text referents.

Four other studies have compared the use of online chat and the oral mode for peer review but found mixed results, which demonstrated the complexity of computer-mediated peer review. Shultz (2000) compared how fifty-four French students revised based on feedback from face-to-face discussion and online real-time discussion. She found that students made local and specific changes in the online mode because they could access the detailed suggestions made in writing. More global changes were made in the oral mode as it may allow more rapid interaction and exploration of the writer's goals and intention. The finding seems compatible with that in Honeycutt (2001) as unlimited text-referencing free from in-class time and space in the online mode, which is missing in the oral mode, may contribute to different revisions. In a case study grounded in naturalistic inquiry of an ESL setting, Hewett (2000) compared group talk for peer revision in face-to-face and synchronous chat modes. Talk in the oral mode focused on global and abstract idea development, whereas online chat facilitated group management and the writing tasks. Revision from the synchronous chat included more frequent direct use of peer ideas, whereas revision from oral talk consisted of more frequent imitative or indirect borrowing of peer ideas, and self-generated idea use. Hewett suggests that different media may influence types of talk and shape the follow-up revision.

Liu and Sadler (2003) compared peer comments and revision by eight ESL learners using either the traditional mode or the chat function in MOO (Multi-user

domain Object-Oriented, a text-based online virtual reality environment). The MOO group with online chat were found to make more comments through discussion, but face-to-face communication was more effective in terms of revision-oriented comments and action revisions made. Students favoured the use of technology as they already did online chats in their daily lives. It was suggested that the use of *Microsoft Word* editing combined with face-to-face interaction may be effective than a mode of using both editing and commenting online. They also pointed out the limitations of synchronous technologies: frequent problematic turn-taking or chaotic multiple comments might impede comprehension or revision. A MOO transcript attached in their appendix shows that the interaction was from at least three students. Too many members, instead of the synchronous mode itself, in their arrangement could cause chaotic flows of online messages. Several scholars recommend that pair work, if the class size allows, be better than groups with a larger size as it allows intensive discussion and easier group management (Hu, 2002; Miao et al., 2006; Villamil & De Guerrero, 1998). Further, extraneous factors such as limited student access to Internet and different settings (using MOO in class time but oral discussion as homework) may contaminate their research design and findings.

Tuzi (2004) compared how twenty ESL writers revised, given oral feedback from teachers, writing centers, and friends, as well as asynchronous electronic feedback from their peers. Different from what was found in previous studies (Honeycutt, 2001; Liu & Sadler, 2003; Shultz, 2000), results from text analyses and interviews indicate their students liked oral feedback more perhaps due to prior habitual tendency, but e-feedback stimulated more revisions at the sentence-level, unlike meaning-preserving word-level revisions as influenced by oral feedback (Connor & Asenavage, 1994; Mangelsdorf & Schlumberger, 1992). Tuzi suggests that students' learning styles and clear impact on revision from different modes of feedback should be investigated in the future.

Four other studies examined peer interaction or students' perceptions but without data on student revisions on texts; three of them supported the use of technologies for peer review but one provided cautions. DiGiovanni and Nagaswami (2001) compared effects of synchronous conversation and face-to-face peer review on thirty-two ESL students. Their students felt quite positive toward online peer response, although synchronous online peer review or even the technological platform might entail some limitations, such as insufficient training time for online negotiation or lack of keyboarding skills. Analyses of the negotiation were found to be similar in both of their online group and the face-to-face group. Based on the data

of twelve French-L2 students, Heift and Caws (2000) found that the students collaborated in the synchronous communicative environment, and provided peer feedback in the form of cognitive and social acknowledgements; those who provided the more acknowledgements were not necessarily the more proficient L2 learners. This might suggest that learners' individual differences such as personalities could have an impact on the talk. Wang (2004) observed the effects of online peer feedback using an asynchronous bulletin board on thirty EFL college students. They found that the students provided feedback and felt positive about the computer program. Individual differences such as time on task and students' working styles were found. Ho and Savignon (2007) compared the attitudes of thirty-three EFL college students who used face-to-face peer review and e-mail peer review. They found the students liked the face-to-face mode more as e-mail did not allow verbal communication. Moreover, the time delay in e-mail also caused some students' deliberate procrastination and failure at providing timely feedback. However, they suggest that different software used for peer review is likely to generate different outcomes. Chung and his colleagues (Chiu, 2006; Chung et al., 2007) developed their own web-based peer collaboration system, WE-COOL (Writing & Evaluation – COoperative Online Learning) to address various dimensions of peer review and collaboration issues in senior high contexts of Taiwan. Group rewards were found significant; in spite of several positive findings concerning their experiments, the writing performance of high school learners in their studies require far more efforts, besides CALL enhancement.

As illustrated from the review above on computer-mediated peer review, several factors that influence its success are at issue. Matching of different technologies with goals of writing activities is crucial but the answer for ideal ways of matching is still unclear, given the mixed findings from the literature. Under specific types of communication modes, availability of text-referencing and group size seem to be important for the review process. For instance, can pair work in synchronous chat stimulate orderly talk for peer review? To which extent does online text-referencing facilitate peer review? Last, learner factors such as familiarity with technology and personalities are at play. In a writing context, perhaps students' self-perceptions on their weaknesses in writing may make differences, which are rarely addressed in the review above and warrants more research.

1.2 Pedagogical Needs for Grammatical Accuracy in EFL Contexts: Online Reference Help

Through recent investigation of learner corpora, specific weaknesses such as connectors and collocation in writing were found (Granger & Tyson, 1996; Liu, 2002; Nesselhauf, 2003). Findings from a Chinese-L1 learner corpus of English (Liu, 2002) indicate that verb-noun miscollocations were ranked on the top. The lack of collocational competence may affect writing fluency and prevent learners from producing appropriate native-like language. Similarly, the analysis of an EFL learner corpus (Yeh, Liou & Yu, 2007) points out that many college-level students have a great tendency to "underuse," "overuse," and "misuse" some connectors in their writing, which may disrupt coherence of the written texts and lead to a potential communicative breakdown. Faced with these problems, reference tools targeting text-based accuracy can be helpful for learning. Recently, corpus-based electronic referencing tools such as concordancers or collocation retrieval programs have become sophisticated enough for EFL/ESL learners to obtain diction scaffolds for writing (e.g., Chambers, 2005; Horst, Cobb, & Nicolae, 2005; St. John, 2001). For instance, Chan and Liou (2005) found that concordancer-enhanced instruction can be facilitative for the learning of collocations in gap-filling sentence tasks. Likewise, other EFL studies (e.g., Tseng & Liou, 2006; Yeh, Liou, & Li, 2007; Yeh, Liou, & Yu, 2007) have found the use of concordancing can facilitate the learning of English synonymous adjectives and connectors in writing. Yet it remains to be seen whether concordancers can be helpful for promoting accuracy through online peer review. One of teachers' recurring concerns is the weak language ability of EFL students to help each other in peer response. If those e-referencing tools can be incorporated into an integrated online environment as an additional source of knowledge, both tool-regulated and other-regulated learning (meaning "peer") can be enhanced in order for language learners to move to self-regulated learning (Guerrero & Villamil, 1994; Vygotsky, 1978).

Inherently, peer response is a complex event where the review task, the text, students as readers or writers, peer interaction, and even the teacher's role all interact and influence group dynamics, the review process, and the outcome (Lockhart & Ng, 1995). By inviting the factor of technology use such as online chat and diction tools, computer-mediated peer review requires fuller description with both feedback and outcome (Ferris, 2003) in order to understand what it is like and how language teachers may apply in writing classes. In the present case study, a web-based peer review system was developed with an aim to help EFL college learners to write more accurate and better English essays. Pair work is designed with online chat and two corpus-based diction tools integrated in the system. Use of the

diction tools is to match the instructional goal of strengthening vocabulary abilities with EFL learners' needs. The following research questions guided the study:

(1)What are the students' perceptions of the usefulness of the peer review activities in a web-based synchronous commenting environment?

(2)How is their English performance before and after such online peer reviews influenced, as shown in scores of essays and vocabulary tests?

(3)How do the students conduct collaborative writing as designed in peer reviews, and how does their pair work vary and influence their perceptions?

(a) What types of online negotiation do they engage in?

(b) How do they use the peer's comments for revisions? What are the types of revisions made?

The question set attempts to examine three important dimensions of computer-mediated peer response to uncover its complexity: students' perceptions (student-writers), writing improvement and text revision (text), and their learning-to-write processes (writing process) by exploring how peer interaction influences what the students think as useful. Student-writers, text, and the writing process have been regarded as important major variables in addressing writing research and instruction. This exploratory study is a response to Ferris' call (2003) by examining both peer response characteristics and outcomes through data triangulation.

2. The Study

2.1 Participants, the Platform

Seventeen EFL college freshman students in a public university of an East Asian country participated in the study with Chinese as their first language. All participants aged around eighteen and two of them were male. They all took English as their major field of study. These participants formed an intact class and took the freshmen composition as a required course. Prior teaching experiences with students of a similar level indicated that they need much help with the basic command of English in writing, that is, structures and vocabulary, due to limited writing

experiences in high schools where discrete knowledge and tests were the focus of the instruction. The pedagogical objective of the course thus was to improve students' vocabulary competence and grammatical accuracy without sacrifice of general writing quality. In an eighteen-week course, eight of the weeks were devoted to computer Lab sessions with the remaining time in the classroom. The teacher designed activities in both settings, trained the students how to carry out online peer review, and served as a facilitator when the participants were working in the Lab. She was the assessor of summative evaluation (with a grade and comments) on three writing tasks given to the participants during the project. A writing textbook with exercises and assignments was used in this class.

To facilitate learning of writing for a genuine communicative purpose through online peer response, we designed a platform named as *POWER* (an acronym for Peer Online Writing & Editing Room). *POWER* was developed based on a web-based programming language and a database plus a chat mechanism. The two formed a blogging platform with chatroom and document management functions. The interface for commenting looks similar to the combination of *Microsoft Word* and MOOs (see Figure 1). *POWER* allows students to invite other users to edit their drafts saved in the system (with full annotation features as in *Word*) at the same time when they are in different places via online discussion with the target document on screen for both sides. The left portion of the screen shows the chatroom area for students' negotiation and discussion. The right half presents the entire text to be read or commented/changed by both sides. Text referencing allows unlimited access to drafts and revisions at any place and time, and the texts and their changes serve as concrete referents for online discussion. Content of students' chat can be recorded for the teacher to observe individual participation as well as for learners to regulate their learning process after each online session. Further, *POWER* incorporates two web-based diction tools which are shown to be pedagogically useful[2]: a Chinese-English bilingual concordancer, *TotalRecall*, and a collocation retrieval program, *Tango.* With *Tango,* students can locate sentence examples or the appropriate collocate(s) which goes with the key word (e.g. *achieve* the ambition, *destroy* my confidence). The two programs provide example sentences for keyword search by providing an additional knowledge source in peer reviews.

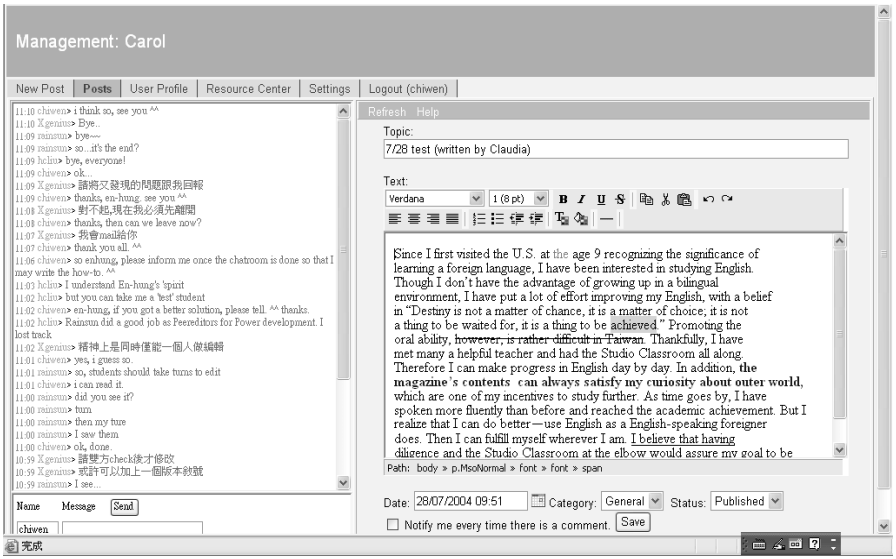

Figure 1 The interface of POWER

2.2 Research Instruments and Procedure

Research instruments included a thirty-minute timed writing task, a twenty-item vocabulary test, and two questionnaires. The vocabulary test was designed in a gap-filling format on adverbial connectors and verb-noun collocations. Items in the test used before the project were re-ordered as the posttest version with content checked by two professors in the field of English teaching. Students' perceptions about the online peer review process were elicited through a twelve-item Background Questionnaire and a twenty-four-item Evaluation Questionnaire. The purpose of the Evaluation Questionnaire was to elicit the participants' perceptions about the overall effectiveness of the online environment and peer response sessions. Most of the items were designed in a five-point Likert scale. To understand in more depth of what was happening in each session, the learning process data of eight learners in four pairs were gathered. The four dyads were somewhat randomly selected with a minor consideration of representativeness in terms of gender distribution (2 males out of 15 females in the original group, and 1 male/7 female in the chosen sub-group). The data included students' drafts, revised versions, and the discussion logs from the three online sessions.

The course context and data collection procedures are as follows. In the first three weeks of the semester, the participants met in the classroom with the instructor working on the orientation and teaching of sentence strategies and rhetorical conventions for academic writing. In the fourth week, the first timed essay task, the first vocabulary test, and the Background Questionnaire were given for the participants to complete. Then, a peer response training session for sixty minutes was provided in a computer laboratory by the researcher which introduced the students about the functions of the system, the strengths of process writing and peer response, and the ways to conduct an effective peer review. We then helped the participants practice peer response on *POWER* in the lab. Then the participants moved onto the formal peer response stage for the first two writing cycles in a computer lab in class. In the third cycle, students carried out the peer response activity as a take-home assignment either in the dormitory or in the computer center on campus or wherever with Internet access. In the beginning of each writing cycle, students were told the topic of the essay a week ahead, and then they were asked to compose a draft on either *POWER* or with other word-processing software. The seventeen participants grouped in pairs (based on the advice in Miao et al., 2006) except one in triple were carrying out a peer response session of forty to fifty minutes online in a computer lab together or at any location to carry out peer review with a prompts sheet. The peer review prompts sheet suggests to the students they may examine the essay concerning the content/ideas, organization, language use/vocabulary, and overall effectiveness. One member assumed the role of the reader-reviewer first commenting on the other's draft; later, they switched the roles and commented on another draft. The participants were encouraged to make good use of the referencing tools for diction particularly concerning the usage of collocations and connectors. At the end of every session, the students were told to revise their drafts according to the feedback from their peer at home, and hand in their revised drafts to the instructor next class. The above steps were duplicated twice in the following weeks. The three writing prompts were "a special festival/holiday", "an ideal ____(a person)", and "my life at the college". After the three writing cycles, the Evaluation Questionnaire, the vocabulary test, and the writing task were distributed to the participants to complete. The writing topics for the two tasks were "an unforgettable experience" and "the person I admire most". The entire period of the project lasted for eight weeks.

Additionally, we investigated the process data in order to shed light on possible causes for the changes in performance during peer reviews. Such data included

students' online discussion logs, drafts, and revised versions. Due to the large volume of the logs from the seventeen participants, only those of four pairs were sampled. The eight students were Mike, Janet, Cindy, Debby, Rita, Kate, Vicky and Celina (pseudo names). There were twenty-four pieces of discussion logs in total. To analyze the data on various levels, several coding schemes used by scholars in the literature were surveyed and tried out; those presented in this study were found to have a better fit. Coding of these data was conducted by one of the researchers, whereas the other spot-checked about ten percent out of the total data for consistency.

2. 3 Results

To address the research questions, findings are presented below, followed by general discussion.

2.3.1 Students' Perceptions on the Peer Review Process

From learners' responses to the Background Questionnaire given prior to peer reviews, we found that a very high percentage of the learners (94.7%) used computers with Internet access frequently either in their dorms (89.4 %) or in the computer center on campus (10.5%), indicating that with enough computer literacy, the students were ready for *POWER*. Regarding the learners' English writing experiences, they reported that their weaknesses were mostly in organization (63.2%) and word use (57%). The second weakness explicitly points to a student need and supports the design of incorporating diction tools in the study to assist their vocabulary use.

To answer the first question, responses to items in the Evaluation Questionnaire were analyzed. In Table 1, the results of the Evaluation Questionnaire indicate that almost all the participants understood the importance of revision after the online peer reviews (mean average 4.8 out of a total 5.0 coded as "strongly agree"). 94.1% of the students (Mean=4.6) will revise their writing for improvement in the future after the peer review experiences. A slightly lower mean was found for overall improvement of writing after peer reviews (Mean=4.0). In addition to peer feedback and traditional resources such as translators and dictionaries, all the learners had utilized *TotalRecall* and *Tango* (Mean=5.0, also confirmed by the researchers' observations). They found *POWER* a useful assistant to facilitate their revising process (Mean=4.0). Specifically, the usefulness of *POWER* on various aspects of writing shows a moderate but wide-range distribution: grammar (52.2%), word use

(52.2%), mechanics (47.1%), content (35.3%), and organization (17%). Although in the Background Questionnaire the students indicated they were weakest in organization, only 17.7% of them thought online peer review was helpful for organization. Word use was ranked as the second major weakness, and *POWER* was regarded slightly more helpful: 52.2% of them agreed. Concerning the two diction tools, the students showed slightly more satisfaction. With parallel translations of texts in *TotalRecall*, the participants indicate that they could understand the meaning and the usage of a new word (Mean=4.2), and in *Tango*, they could learn about verb-noun collocations (Mean=4.2). They approved that the bilingual concoradancer *TotalRecall* was an effective assistant for learning connectors (Mean=3.8) and new words (Mean=3.8); *Tango,* for learning of collocations (Mean=3.9). Furthermore, all except one participant expressed their motivation and willingness to utilize the two tools for writing in the future. The reasons[3] for this particular learner were (a) disruption in the process due to lookups of the two tools, (b) *Tango* having too many output sentences to allow full processing, and (c) having problems inducing patterns. Although the participants showed moderate satisfaction with the online environment, it seems the two diction tools were helpful as all of them had used the tools and found the environment more helpful with word use (4.2).

Table 1 Students' perceptions about conducting peer response on POWER

Items	**Mean**	**Rank**
4. In addition to peer feedback, when revising English essays, I used *Totalrecall* and *Tango*.	5.0	1
3. After the online peer response sessions, I understand the importance of revision in English writing.	4.8	2
1. After the online peer response experiences, I will revise my English writing in the future.	4.6	3
18. With parallel translation of texts in *Totalrecall*, I understand the meaning and the usage of a new word better.	4.2	4
23. With parallel translation of texts in *Tango*, I understand the meaning and the usage of a collocation better.	4.2	4
2. After revisions, I feel my English writing generally improves.	4.0	6
7. I feel conducting peer response on *POWER* helps me a lot with the revision of my writing.	4.0	6
5. I like conducting peer response on *POWER*.	3.9	8
22. I feel *Tango* helps me use appropriate collocations in English writing.	3.9	8
6. I think the peer response sessions on *POWER* successful.	3.8	10
16. I feel *Totalrecall* helps me with word use in English writing.	3.8	10

Table 1 Students' perceptions about conducting peer response on POWER (continued)

17. I feel *Totalrecall* helps me use appropriate connectors in English writing.	3.8	10
19. I know clearly about the search functions of *Totalrecall*.	3.7	13
24. I know clearly about the search functions of *Tango*.	3.7	13
12. After conducting peer response on *POWER*, I like English writing.	3.5	15
8. I think the peer response sessions on *POWER* enhance my overall English writing ability.	3.4	16
9. After conducting peer response on *POWER*, I have greater confidence in English writing.	3.2	17
10. I think through the peer response sessions on *POWER*, my English writing apprehension lessens.	3.2	17
Mean	3.93	
11. Conducting peer response on *POWER* helps me most with English writing in content: 35.3% organization: 17.7% grammar: 52.2% word use: 52.2% mechanics: 47.1% (students were allowed to choose more than one choices) Other:_____		
13. Which do you prefer, conducting peer response on *POWER* in class with LANs or after class for distant learning? In class: 52.9% After class: 47.1%		
14. If possible, I would like to use *POWER* to conduct peer response for revision in the future. Yes: 100.0% No: 0.0% Reasons _____		

Note: 5--Strongly Agree 4:Agree 3:Neutral 2:Disagree 1:Strongly Disagree

For the effects on writing confidence and apprehension, the ratings were not high: increase of confidence (Mean= 3.2) and decrease of apprehension (Mean= 3.2). A more encouraging finding is that if possible, all learners would like to utilize *POWER* for peer response and revision in the future[3]. Slightly over half of them (52.9%) preferred conducting peer response on *POWER* in class with LANs than the use after class for distance learning (47.1%). Overall, the average mean was 3.93, close to the "agree" category (4.00).

2.3.2 Changes in Students' Performance in the Tests and Writing

To examine the influence of online peer response augmented by two concordancers on vocabulary and general writing quality, assessment of the learners at two time points was conducted with a vocabulary test and a writing task. These are to respond to the second question. Each correct item in the tests was given five points and the full scores were 100 points. Because the sample size was only seventeen, a non-parametric statistic test, the Wilcoxon signed ranks test was chosen to examine whether there were any statistically significant differences between the

pretest and the posttest scores. A significant difference was found on comparisons of the total scores, as well as part scores of connectors and collocations (all p's < 0.05). It indicated that the online peer response sessions may facilitate the increase of the students' overall knowledge in connectors and collocations in gap-filling tests.

To evaluate students' performance as elicited in free production, two raters who were graduate students in the MA-TEFL program, graded essays written in the pretest and posttest periods, based on the criteria of the ESL Composition Profile (Jacobs et al., 1981) with an inter-rater reliability 0.91. The rating yielded total scores and sub-scores concerning content, organization, vocabulary, language use, and mechanics. Comparisons of all the students' essay scores were made by the same statistic test as shown in Table 2. Significant differences were found concerning the subcategories of content and vocabulary, and the total scores. We also scrutinized error frequency concerning adverbial connectors and verb-noun collocations in the essays. The outcome indicated that learners' error rates in connective usage dropped from 5.3 per unit (500 words as a unit) to 2.0 per unit after the project. Likewise, learners' collocational errors rates decreased from 2.2 per unit to 1.4 per unit. Such a result also corresponded to the ratings based on the Profile regarding the increases of vocabulary sub-scores and total scores (overall writing quality) after *POWER* sessions.

Table 2 Comparison of scores between essays written before and after the project

		N	Mean Rank	Sum of Ranks	Z scores	Sig. (2-tailed)
Content2 – Content1	**Negative Ranks**	5[a]	6.70	33.50	-2.048	.041*
	Positive Ranks	12[b]	9.96	119.50		
	Ties	0[c]				
	Total	17				
Organization2 – Organization1	**Negative Ranks**	5[d]	8.80	44.00	-.913	.361
	Positive Ranks	10[e]	7.60	76.00		
	Ties	2[f]				
	Total	17				
Vocabulary2 – Vocabulary1	**Negative Ranks**	3[g]	5.67	17.00	-2.015	.044*
	Positive Ranks	10[h]	7.40	74.00		
	Ties	4[i]				
	Total	17				
Language Use2 – Language Use1	**Negative Ranks**	5[j]	7.10	35.50	-1.400	.161
	Positive Ranks	10[k]	8.45	84.50		
	Ties	2[l]				
	Total	17				
Mechanics2 – Mechanics1	**Negative Ranks**	4[m]	5.88	23.50	-.884	.377
	Positive Ranks	7[n]	6.07	42.50		
	Ties	6[o]				
	Total	17				
Total2- Total1	**Negative Ranks**	3[p]	8.17	24.50	-2.019	.044*
	Positive Ranks	12[q]	7.96	95.50		
	Ties	2[r]				
	Total	17				

Note 1: *Sig. p<0.5
Note 2:
a. Content2 < Content1 b. Contetn2 > Content1 c. Content2 = Contetn1
d. Organization2 < Organization1 e. Organization2 > Organization1
f. Organization2 = Organization1 g. Vocabulary2 < Vocabulary1
h. Vocabulary2 > Vocbulary1 h. Vocabulary2 = Vocabulary1
i. Language Use2 < Language Use1 j. Language Use2 > Language Use1
k. Language Use2 = Language Use1 l. Mechanics2 < Mechnics1
m. Mechanics2 > Mechanics1 n. Mechanics2 = Mechanics1
o. Total2 < Total1 p. Total2 > Total1 q. Total2 = Total1

2.3.3 Negotiation of Meaning in the Online Discussion

To answer research question 3(a), all discussion logs were analyzed from two perspectives: content of talk and function of talk. First, the twenty-four pieces of discussion logs were divided into idea units[4] (Chafe, 1980), a unit roughly equivalent to a clause. In classifying the content of the talk, the coding scheme in Mulder and Swaak (2002) was adopted and revised (see Appendix A for details). The scheme was originally used for observing the processes of shared understanding in an online group learning context. It was found that the scheme fit our data analyses as one genre of online discourse. Table 3 displays the distribution of 1043 idea units across five content categories: procedural, social, technical, task-related, and off-task talks. It was found that students concentrated a lot on their writing task at hand, and focused on discussing issues related to writing since 68.5% of the online talk was task-related topics. Of these task-related utterances, the highest percentage was devoted to form-related talk (25.5%). This indicated that grammatical accuracy may be what the students were concerned about most. If the discussion on others was excluded, altogether 53.6% (sum of content/form-related talk and evaluative talk) of them were text-related comments. The learners produced little talk regarding technical issues (5.8%), which suggests that *POWER* could be user-friendly and stable enough.

Table 3 Distribution of content of talk during online peer response

Categories \ Pairs		Pair A	Pair B	Pair C	Pair D	Total	Percentage
1.	**Procedural**	22	22	19	41	104	10%
2.	**Social**	30 (9.5%)	32 (14%)	27 (13%)	48 (16.4%)	137	13.1%
3.	**Technical**	8	15	1	36	60	5.8%
4.	**Task-related**	247	155	156	156	714	68.5 %
	a. Content-related	33 (13.4%)	27 (17.4%)	97 (62.2%)	33 (21.2%)	190	18.2%
	b. Form-related	128 (51.8%)	77 (49.7%)	8 (5.1%)	53 (34%)	266	25.5%
	c. Evaluative	39	34	26	4	103	9.9%
	d. Others	47	17	25	66	155	14.9%
5.	**Off-Task**	8	4	5	11	28	2.7%
Total		315	228	208	292	1043	100%

In the second stage, the idea units in the task category (only that 68.5%, 714 idea units) were further analyzed according to their functions in order to understand what they did with their online discussion. Mendonça and Johnson's scheme (1994) was adopted and modified to analyze this portion (see Appendix C for details). Four major types of negotiation patterns occurred during online peer response: questions, explanations, restatements, and suggestions with their frequencies shown in Table 4. The results indicated that generally students were able to apply different language functions in online peer response sessions. In particular, most students were willing to share their experiences and knowledge with their partners as 66.7% of task-related talk was on explanations of opinions and information in order to negotiate the meaning and accomplish the review task.

Table 4 Type and frequency of negotiations found in online peer response

	Frequency of Occurrence	
Type of Negotiation	*n*	*%*
1. Question		
Request for explanation	95	13.3
Request for suggestion	32	
4.5		
2. Explanation		**66.7**
Opinion	428	60
Information	48	6.7
3. Restatement	16	2.2
4. Suggestion	95	13.3
Total	714	100

2.3.4 Types of Revisions

To address research question 3(b), all the four pairs' first drafts (written before online review) and their corresponding revised versions after receiving feedback from their peers were analyzed. The analysis procedures followed Mendonça and Johnson's categorization (1994) so as to identify whether and the extent to which revisions were made as influenced by the given feedback. Three combined labels were devised to code types of incidents in students' revised texts: (a) Revised based on Peer Response (R/PR), (b) Not Revised in spite of Peer Response given (NR/PR), and (c) Revised but not based on Peer Response (R/NPR). With variation of the revising actions, the results showed that the learners mostly made changes on their essays by adopting their peers' feedback as evidenced in 72.7% under the R/PR category in Figure 2 (NP/PR, 14.1%, and R/NPR, 13.2%). The nature of the changes made on drafts was further analyzed based on the classification in Sze (2002) (see Appendix B for the coding scheme) in which changes were categorized into five levels ranging from surface changes to content changes. Those at the first three levels were considered as lower-level changes, namely, surface changes or mechanics, lexical changes, and phrasing changes. The fourth and fifth levels (structural and content changes) were related to changes in organization and content. As shown in Figure 3, the sum of the percentage of the first three levels (86%) in frequency exceeded by far that of the structural (4% within or across paragraphs) and content levels (10%). The results pointed out that though students accepted online peer feedback at different levels in order to revise their drafts, rather than having structural and content-based changes, most of them made local modifications in their revisions: surface level (33%), lexical level (28%), and phrase level (25%).

Figure 2 Proportions of three types of revising actions taken by students

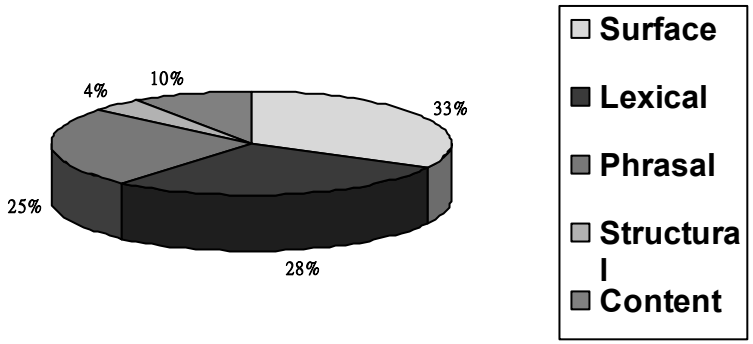

Figure 3 Proportions of levels of revisions from peer feedback

2.3.5 Pair Differences: Interactions and Perceptions

Ferris (2003) maintains that with the complexity of social interaction in peer reviews, attendant expectations should be investigated. To explore why the four pairs had different interaction patterns and how each pair thought their specific patterns affected the effectiveness of peer reviews is our focus through data triangulation. This can serve as one window to show pair differences in the learning-to-write process. The findings respond to the last research question as a whole. Across the board in Table 3, contrasts from two major categories (social and task-related) are noted. Within the main category of task-related talk, while Pair C talked more on content-related issues, the other three pairs talked more on form-related issues. Pair D, the only pair using Chinese (L1) occasionally for discussion, generated the most social talk, unlike the other three pairs. Pair A with members of Janet and Mark generated 51.8% form-related talk, which was the highest percentage among those of the four pairs. The two participants could be very much concerned about accuracy for writing quality, and devoted a great amount of talk addressing form-related issues in their drafts. Not surprisingly, Janet and Mike noted in the Evaluation Questionnaire that the online peer response project improved their writing concerning word use, grammar, and mechanics.

Pair B, composed of Debby and Cindy, was a more unbalanced dyad (than the other three pairs) in which one student was far more proficient in English than the other. In fact, Debby in Pair B was the best student among the chosen eight, based

on test and writing scores assessed prior to peer reviews. By contrast, her partner, Cindy, was less proficient and indicated in the Background Questionnaire that she had greatest difficulty in grammar and word use for writing English essays. The results of their discussion logs show that Cindy spent the most of her task-related talk on form-related issues (66.3%, the highest among the eight participants; talk of this category in Pair B is close to that of Pair A, 49.7% vs. 51.8%, higher than those of Pair C and Pair D). After online peer reviews, Cindy reported in the questionnaire that peer feedback assisted her most regarding grammar and word use. It is likely that both Debby's feedback and information Cindy obtained from the two concordancers filled the gap of the weaker learner's knowledge about English writing.

The students in *Pair C* (composed of Rita and Kate) seemed to have troubles putting down ideas during their drafting period partly due to their more limited English writing experiences in high schools. In the Background Questionnaire, Rita and Kate pointed out that they were most seriously troubled with generating ideas for writing, which the other three pairs did not emphasize. Thus, even with the completion of their first drafts, most of their online talk in peer reviews was centered on idea brainstorming and content development (62.2% in the content-based category, the highest of the four pairs), substantiating the first drafts or "reinventing the wheel" by drastically changing the entire organization and ideas. The peer comments were useful, for both members adopted many of them for revisions (Rita, 68.4% and Kate, 100%). Because their peer feedback was mainly on content issues, most of the revisions made in the second drafts resulted in macro-text-based changes (Connor & Asenavage, 1994) in which the writer changed the direction or the main ideas of the drafts. The following excerpt shows how the pair negotiated ideas for content development.

11:42 Rita> Well, I think you can write more characteristics about an ideal mate.

11:43 Kate> yeh that's wot i think so

11:44 Rita> For example, should he an optimistic person?

11:44 Kate> oh yeah~i didn't think of that~

11:44 Rita> or diligent?

11:45 Kate> yeh~there r so many i could write but i missed

11:45 Rita> That's fine.

11:45 Kate> thx 4 tellin' me [shorthand for “thanks for”]

11:46 Rita> And I think you miss an most important thing.

11:46 Kate> yeh?

11:47 Rita> What interests should he have? And should the interests be the same with yours?

11:48 Kate> yeh~~~~that's so important

11:48 Kate> i'm only focusin' in how he looks!

11:48 Kate> hahaha

11:48 Rita> ha~

11:49 Kate> focus on i mean

11:4 9Rita> I know.

Rita as the reader inspired Kate, the writer, to add ideas to her essay, and Kate seemed to agree to her opinion. The following excerpts of two drafts show how Kate modified the writing according to the feedback.

First draft

My ideal mate is also required to have a kind heart. And I always observe this through how he interacts with people. Some men would be nice to you, but some of them would be really rude to other people. For example, they will say something sweet to you and the next minute he would shout at a naughty little boy. If I notice that, I would know that actually he is not a good person to rely on, he is just somebody who wants to date me, and that makes me feel terrible.

Revised draft

My ideal mate is also required to have a kind heart…[same text omitted] If I notice that, I would know that actually he is not a good person to rely on, he is just somebody who wants to date me, and that makes me feel terrible. *Also, my ideal mate does not need to have the same interests with me though it would be better if he does. I think he could have his own interests so that I can learn something else that I do not know from him, and it will make the relationship more interesting.* [elaboration of the draft by incorporating peer’s suggestions]

Clearly, Rita’s suggestion helped Kate figure out that there was

something missing in her essay. Kate then expanded the paragraph by including the suggestion whether taking similar interests was a requirement in an ideal mate. The responses of Rita and Kate in the Evaluation Questionnaire pointed out that after *POWER* sessions, they improved most in content of their writing. Clearly, online peer response may enrich the content, not just grammar or vocabulary, of writing as students shared experiences and ideas with each other by providing meaning-based suggestions for revision.

Vicky and Celina, members in Pair D, indicated different weaknesses in writing in the Background Questionnaire. Vicky did not have a good command on the grammar when she composed in English; in contrast, Celina identified her weaknesses in content and word use. The percentage of their content-related talk was ranked the second. However, their social talk was ranked the first (16%) among the four pairs, and they used much social greeting during online peer response. Further, Vicky and Celina were the only pair that sometimes used their first language, Chinese, for communication. After *POWER* sessions, in the Evaluation Questionnaire both Vicky and Celina reported they liked online peer response and thought that the activity helped them a lot with the revisions. Vicky even said that conducting peer response on *POWER* was like talking with friends through MSN (*Microsoft Messenger*)—it was fun and relaxing. Apparently, the comfort with synchronous technologies and perhaps sociable personalities would encourage the pair to make best use of the synchronous technology, transfer its original social functions to other domains, and harness online peer feedback to augment their learning-to-write process. Celina noted that online peer feedback assisted her most regarding content and word use, matched with her self-perceptions of writing weaknesses.

The sampled four pairs benefited from the peer response activity differently, given their various proficiency levels, technology familiarity, personalities, or perceptions about their own writing weaknesses. During peer reviews, three pairs show a dominant focus on form-related issues with the exception of one pair on idea generation. The students' focus of their own writing weaknesses seems to direct what was discussed online and even their revision strategies. Why they talked more on either content or form of the drafts seems to come from self perceptions of the students' own writing weaknesses; in turn, how they interacted via online talk on content or form matched with how they believed computer-mediated peer reviews to

be effective, serving either content- or form-based revisions. Their customization of technology to suit their learning-to-write purposes during collaborative writing could become an important step toward learner autonomy.

2.4 Discussion

In this study, factors of three important dimensions influencing effects of computer-mediated peer review are addressed: student-writers, their texts, and the learning-to-write processes. First, the students' overall reactions toward the online peer response activity were moderately positive, based on the questionnaire responses (Mean=3.93 out of 5.00). The original design of meeting in the Lab was for the instructor to facilitate the review process by giving technical help, when necessary; however, our learners preferred carrying out peer review at home with more time on task (nearly half-half for either location). Moreover, the students rated the items on confidence and apprehension the lowest. As only one type of teaching activity in a course, that eight-week long online peer review cannot lead to reduction of writing apprehension, increase of writing confidence, or improvement of overall writing performance is probably reasonable; longer-term intervention is needed. The two factors may explain why they were only moderately satisfied with peer reviews on *POWER*. It is however confirmed that the group showed enhanced awareness of the importance of revisions, and willingness to revise writing and keep using *POWER* in the future after the peer review experiences, and affirmed the helpfulness of carrying out peer response with diction tools (rating higher than the grand total, 3.93). Although only one out of the seventeen participants had problem with the concordancers, specific training may still be needed for students who could not make appropriate use of the corpus-based diction tools.

For the text dimension, we tapped into how the student-writers produced differently before and after peer review, and how they modified their drafts after obtaining peer feedback. Before and after peer review, the students were assessed by a test (targeting connectors and collocations) and a writing task. Comparisons of the test scores and rating of the writing (regarding content, vocabulary, and total scores) indicated significant differences after peer reviews, together with reduced error rates. Without a control group, it is, however, difficult to attribute the gains to the practice of the three rounds of online peer review alone. It is likely that the effects may come from a combination of online peer reviews, the instructor's classroom writing instruction, and English input in other courses while the participants were involved in the project. Still, it seems the experiences of obtaining feedback via online talk,

additional knowledge from the two concordancers, and revision with reflection of own writing through others' eyes may be facilitative for the changes with higher accuracy rates between the two time points. With the assistance of peer feedback through *POWER* and lookups from the two concordancers, students may be equipped with better ideas, more precise word usage, and collocational patterns for composing, which in turn, may result in better writing.

As for whether the students adopted the peer feedback to revise their drafts, the answer is positive: 72.7% with the majority of revisions made on the lower-level changes (86%). Similarly, the students had a tendency to discuss about form-related issues treating online peer response as a trouble-shooting activity (Villamil & de Guerrero, 1996). Two concerns could be raised. Earlier research on classroom-based peer response pointed out one drawback of relying on peer review in that L2 or EFL students may not have the adequate knowledge or skills to comment on more important problems in drafts such as those concerning content and organization (Leki, 1990; Liu & Sadler, 2003). However, correction of lower-level errors can also result in written texts with better quality (Polio, 2001). This hypothesis was supported by our findings. The comparison of the participants' writing at two time points indicated an increase in vocabulary, and also in rating of overall writing quality (see Table 2) with lower error rates of connectors and verb-noun collocations on their writing. With scaffolding via online peer response, learners could produce essays of higher accuracy, which in turn, might also lead to better writing quality. Another concern is whether such online peer review facilitates revisions on organization issues of writing, as our students in their Background Questionnaire mentioned that their most serious weakness in writing was organization (63.2%). But during online peer reviews, the issue seemed to be ignored. Either the learners of this proficiency level were weak with organization strategies to detect their peer's problems in the drafts, or the interface only allowing half of the screen to show student writing impedes reading of larger chunks of texts at a time, which makes problem detection of organization more challenging. In previous studies, text-referencing available online was regarded useful for peer review (Honeycutt, 2001; Schultz, 2000), which was one feature we designed in *POWER*. But it is likely that our EFL learners, due to their developing L2 memory, could be "text-bound", focusing on what is visible on screen such as local changes on words, phrases, and output of example sentences from the two diction tools (a similar case in foreign language students of Schultz, 2000). This prevents them to think globally on organization and re-arrangement of several ideas to achieve coherence within or

across paragraphs. Whether these are true needs future inquiry.

In the learning-to-write process of carrying out peer commenting, the learners were found to constantly engage in constructive negotiation with on-task talk (68.5%) and various language functions in order to improve their drafts concerning either language form or the content. Such use of online peer review corresponds to those of previous studies in that students concentrated on the writing task at hand, dealt with a variety of topics, and applied different types of language functions for negotiation, inclusive of questioning, explaining, suggestions and restating (DiGiovanni & Nagaswami, 2001). The result confirms to Mendonça and Johnson's claim (1994) that peer response allows L2 learners to exercise their thinking as opposed to passively receiving information from the writing instructor. Unlike the Chinese learners in Carson and Nelson (1996), our learners were willing to provide comments on their peers' writing. Perhaps group solidarity which is more easily formed in a culturally homogenous group leads toward students' willingness to take advice from their peers (suggested in Miao et al., 2006). Further, text-related comments (53.6%), not impression comments as suggested by Liu and Hansen (2002), were evident in this study. Kinds of software may make a difference (Ho & Savignon, 2007). In MOO (used by Liu & Hansen, 2002), few text annotation features are available, but in *POWER*, the editor allows full annotations like those in *Microsoft Word*, making the target spots concrete for online discussion and revision. Due to the learners' different perceptions of writing weaknesses, pair work during the peer reviews was found to vary from each other. Six of the eight participants were concerned with form-related issues and made lower-level revisions on their drafts. The role played by online peer feedback influenced the four pairs' perceptions about kinds of usefulness the participants attributed to: for either form- or content-based help. Although the literature assigns different roles for synchronous technologies to play (Breuch, 2004; Hewett, 2000), it seems that different learners, given the same online environment in this study, would customize them to meet their own demands of obtaining needed feedback and revising texts accordingly, as illustrated in content-based or form-based talk and correspondent revisions. If this is true, it is an important step toward learner autonomy in such a web-based collaborative writing environment.

3. Conclusion

The present study addresses the issue of computer-mediated peer review by EFL learners through investigation of student writing, peer interaction, and students' perceptions. First, the learners demonstrate positive changes in writing performance both locally and globally: an increase in the vocabulary test and the rating of essays (regarding sub-scores of content and vocabulary, and total scores). Second, during the online review process the learners were found to be able to cooperate with their peers mainly with task-related talk. Comments from peers were valued highly and adopted mostly to polish their drafts on form-based changes. It seems that some learners would customize the technology to meet their different demands of obtaining needed feedback and revising texts accordingly with content- or form-related concerns. Last, the learners expressed moderate satisfaction with the web-based platform for peer review, but slightly higher satisfaction with the two diction tools for concordance and collocation lookups.

The design of the current study has some limitations. It did not include a control group so that the gains at two time points cannot be compared. Moreover, the sample size is small and makes it difficult to allow generalization of the findings to other population. Further research may recruit more participants in a computer-mediated peer review project by examining learners' self-perception on writing or software features. To facilitate the pedagogical process of online peer response, elaborate training sessions in the lab are needed to familiarize learners with the functions of the online commenting platform such as *POWER,* and the diction tools. Useful strategies in conducting online peer response should be made explicit with practice sessions as guidance to the peer collaboration project (Min, 2006). If learners are comfortable with the synchronous technology after enough training in class, peer review can be conducted out of the class to ensure better learner satisfaction by providing ample time. Records of online interaction and the texts can assist reflective, and meaning-based communication, facilitated by unlimited access. These records offer time and opportunities for students to monitor their linguistic output and also to ponder over suggestions and explanations from their peers. Additionally, these discussion logs offer teachers the convenience to track learners' accountability and check their problems in writing.

Now that computer technology paves the way for new forms of interaction, online peer response becomes technologically feasible to enhance learners' English ability of writing, reading, communicating, and even critical thinking. Thus, with full preparation and careful instructional design, online peer response can be an alternative for EFL composition teachers to guide their learners for collaborative

writing and to facilitate learner autonomy of learning to write, free from the classroom constraint.

NOTES:

1. Although the treatment of a 1997 EFL study by Braine (2001) was repeated over three semesters, students' hands-on experience with LANs was limited to about three weeks per semester. Like Van der Geest and Remmers (1994), he suggested that although they had negative findings about online peer reviews, technology seemed to be omnipresent and thus teaching students to use it sensibly was recommended.

2. The four EFL studies all used *Totalrecall* on their learners and found positive results (Chan & Liou, 2005; Tseng & Liou, 2005; Yeh, Liou, & Li, 2007; Yeh, Liou, & Yu, 2007). Yeh, Liou, and Li (2007) additionally utilized *Tango* for material preparation.

3. Although some items were designed with dichotomous choices, reasons were provided for learners to choose.

4. According to Chafe (1980), idea units referred to segments of discourse which were consonant with the speakers' focus of attention. The data of online chat in this study look similar to conversation data; thus, the widely accepted idea unit was adopted.

Acknowledgements: The paper is funded by National Science Council projects under NSC 96-2411-H007-033-MY3 and NSC93-2524-S007-001.

References

Bloch, J. (2004). Second language cyber rhetoric: A study of Chinese L2 writers in an online usenet group. *Language Learning & Technology, 8*(3), 66-82.

Bolter, J. D., & Grusin, R. (1999). *Remediation: Understanding new media.* Cambridge, MA: MIT Press.

Braine, G. (2001). A study of English as a Foreign Language (EFL) writers on a Local-Area Network (LAN) and in traditional classes. *Computer and Composition, 18*, 275-292.

Breuch, L. K. (2004). *Virtual peer review: Teaching and learning about writing in online environments*. Albany, NY: State University of New York Press.

Carson, J., & Nelson, G. (1996). Chinese students' perceptions of ESL peer response group interaction. *Journal of Second Language Writing*, *5*(1), 1-19.

Chafe, W. L. (1980). *The pear stories: Cognitive, cultural, and linguistic aspects of narrative production*. Norwood, NJ: Ablex.

Chambers, A. (2005). Integrating corpus consultation in language studies**.** *Language Learning & Technology, 9*(2), 111-125. Retrieved August 14, 2005, from http://llt.msu.edu/vol9num2/chambers/default.html

Chan, T. P., & Liou, H. C. (2005). Effects of web-based concordancing instruction on EFL students' learning of verb-noun collocations. *Computer Assisted Language Learning, 18*(3)*,* 231-250.

Chiu, C. Y. (2006). *The effects of cooperative evaluation and group rewards with Writing Evaluation-Cooperative Online Learning (WE-COOL) system on senior high students' English writing achievement and attitudes.* Unpublished doctoral dissertation, National Chia-yi University, Chia-yi, Taiwan.

Connor, U. M., & Asenavage, K. (1994). Peer response groups in ESL writing classes: How much impact on revision? *Journal of Second Language Writing, 3*(3), 257-276.

Chung, S. C., Chiu, C. Y., & Chiang, F. C. (2007). *The effects of cooperative evaluation and group rewards within the WE-COOL system on senior high students' English argumentative writing achievement and attitudes.* (NSC 95-2520-S-415-001). Taipei: Taiwan National Science Council.

DiGiovanni, E., & Nagaswami, G. (2001). Online peer review: An alternative to face-to-face? *ELT Journal*, *53*(3), 263-272.

Faigley, L. L., & Witte, S. (1981). Analyzing revision. *College Composition and Communication*, *32*, 400-414.

Ferris, D. R. (2003). *Response to student writing*. Mahwah, NJ: Lawrence Erlbaum Associates.

Granger, S., & Tyson, S. (1996). Connector usage in the English essay writing of native and non-native EFL speakers of English. *World Englishes, 15*, 17-27.

Guerrero, M., & Villamil, O. (1994). Social-cognitive dimensions of interaction in L2 peer revision. *The Modern Language Journal, 78,* 484-496.

Heift, T., & Caws, C. (2000). Peer feedback in synchronous writing environments: A case study in French. *Educational Technology & Society*, *3*(3), 208-214. Retrieved April 23, 2005, from http://ifets.ieee.org/periodical/vol_3_2000/c01.html

Hewett, B. L. (2000). Characteristics of interactive oral and computer-mediated peer group talk and its influence on revision. *Computers and Composition, 17*, 265-288.

Ho, M. C., & Savignon, S. J. (2007). Face-to-face and computer-mediated peer review in EFL writing. *CALICO Journal, 24*(2), 269-290.

Honeycutt, L. (2001). Comparing E-mail and synchronous conferencing in online peer response. *Written Communication*, *18*(1), 26-60.

Horst, M., Cobb, T., & Nicolae, I. (2005). Expanding academic vocabulary with an interactive on-line database**.** *Language Learning & Technology, 9*(2), 90-110. Retrieved August 14, 2005, from http://llt.msu.edu/vol9num2/horst/default.html

Hu, G. (2002). Potential cultural resistance to pedagogical imports: The case of communicative language teaching in China. *Language, Culture and Curriculum, 15*(2), 93-105.

Hyland, K., & Hyland, F. (2006). Contexts and issues in feedback on L2 writing: An introduction. In K. Hyland & F. Hyland (Eds.), *Feedback in second language writing* (pp. 1-19). Cambridge, UK: Cambridge University Press.

Jacobs, G., Curtis, A. Braine, G., & Huang, S. Y. (1998). Feedback on student writing: Taking the middle path. *Journal of Second Language Writing*, *7*(3), 307-317.

Jacobs, H., Zingraf, S. A., Wormuth, D. R., Hartfiel, V. F., & Hughey, J. B. (1981). *Testing ESL Composition.* Rowley, MA: Newbury House.

Lai, Y. H., & Chung, R. F. (2005). Effects of peer revision on Taiwanese senior high school students' English writing. *Taiwan Journal of TESOL*, *2*(1), 63-96.

Leki, I. (1990). Potential problems with peer responding in ESL writing classes. *CATESOL Journal*, *3*, 5-7.

Liu, J., & Hansen, J. G. (2002). *Peer response in second language classroom*. Ann Arbor, MI: University of Michigan Press.

Liu, J., & Sadler, R. W. (2003). The effect and affect of peer review in electronic versus traditional modes on L2 writing. *Journal of English for Academic Purposes, 2,* 193-227.

Liu, L. E. (2002). *A corpus-based lexical semantic investigation of verb-noun miscollocations in Taiwan learners' English*. Unpublished master's thesis, Tamkang University, Taipei, Taiwan.

Lockhart, C., & Ng, P. (1995). Analyzing talk in ESL peer response groups: Stances, functions, and content. *Language Learning, 45*, 605-655.

Mangelsdorf, K., & Schlumberger, A. (1992). ESL student response stances in a peer-review task. *Journal of Second Language Writing*, *1*(3), 235-254.

Mendonça, C., & Johnson, K. (1994). Peer review negotiations: Revision activities in ESL writing instruction. *TESOL Quarterly*, *28*(4), 745-769.

Miao, Y., Badger, R., & Zhen, Y. (2006). A comparative study of peer and teacher feedback in a Chinese EFL writing class. *Journal of Second Language Writing, 15*, 179-200.

Min, H. T. (2006). The effects of trained peer review on EFL students' revision types and writing quality. *Journal of Second Language Writing, 15*, 118-141.

Mulder I., & Swaak, J. (2002). Assessing group learning and shared understanding in technology-mediated interaction. *Educational Technology & Society*, *5*(1), 35-47. Retrieved April 23, 2005, from http://ifets.ieee.org/periodical/vol_1_2002/mulder.html

Nelson, G. L., & Carson, J. G. (1998). ESL students' perceptions of effectiveness in peer response groups. *Journal of Second Language Writing*, *7*(2), 113-131.

Nelson, G. L., & Murphy, J. M. (1992). An L2 writing group: Task and social dimensions. *Journal of Second Language Writing*, *1*(3), 171-193.

Nesselhauf, N. (2003). The use of collocations by advanced learners of English and some implications for teaching. *Applied Linguistics*, *24*, 223-242.

Polio, C. (2001). Research methodology in second language writing research: the case of the text-based studies. In T. Silva & P. K. Matsuda (Eds.), *On second language writing* (pp. 91-115). Mahwah, NJ: Lawrence Erlbaum Associates.

Shultz, J. M. (2000). Computers and collaborative writing in the foreign language curriculum. In M. Warschauer & R. Kern (Eds.), *Network-based language learning: Concepts and practice* (pp. 121-150). Cambridge, UK: Cambridge University Press.

St. John, E. (2001). A case for using a parallel corpus and concordancer for beginners of a foreign language. *Language Learning & Technology, 5*, 185-203.

Sze, C. (2002). A case study of the revision process of a reluctant ESL student writer. *TESL Canada Journal*, *19*(2), 21-36.

Tseng, Y. C., & Liou, H. C. (2006). The effects of online conjunction materials on college EFL students' writing. *System*, *34*(2), 270-283.

Tuzi, F. (2004). The impact of e-feedback on the revisions of L2 writers in an academic writing course. *Computers and Composition, 21*, 217-235.

Van der Geest, T., & Remmers, T. (1994). The computer as means of communication for peer-review groups. *Computers and Composition, 11*, 237-250.

Villamil, O., & de Guerrero, M. (1996). Peer revision in the L2 classroom: social-cognitive activities, mediating strategies, and aspects of social behavior. *Journal of Second Language Writing*, *5*(1), 51-75.

Villamil, O. S., & De Guerrero, M. (1998). Assessing the impact of peer revision on L2 writing. *Applied Linguistics, 19*(4), 491-514.

Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Wang, M. J. (2004). A study on online peer feedback. *English Teaching and Learning*, *29*(2), 63-77.

Ware, P. D., & Warschauer, M. (2006). Electronic feedback and second language writing. In K. Hyland & F. Hyland (Eds.), *Feedback in second language writing* (pp. 105-122). Cambridge, UK: Cambridge University Press.

Yeh, Y., Liou, H. C., & Li, Y. H. (2007). Online synonym materials and concordancing for EFL college writing. *Computer Assisted Language Learning*, *20*(2), 131-152.

Yeh, Y., Liou, H. C., & Yu, Y. T. (2007). The influence of computerized feedback and bilingual concordancing on EFL students' writing. *English Teaching and Learning, 31*(1), 117-160.

Zhang, S. (1999). Thoughts on some recent evidence concerning the affective advantage of peer feedback. *Journal of Second Language Writing, 8*(3), 321-326.

Appendix A: The Coding Scheme for Revisions

1. **Surface changes (Mechanics)**
   a. punctuation
   b. spelling
   c. capitalization
   d. pluralization
   e. word form corrections other than pluralizations (e.g., subject-verb agreement, verb tense changes)
   f. substitution
2. **Lexical changes**
   a. stylistic substation (e.g., several for a few)
   b. addition or deletion of a single word
3. **Phrasal changes**
   a. syntactic---meaning-preserving rewording, including adding or deleting words (e.g., to avoid a awkward construction)
   b. structural---meaning-preserving sentences restructuring (e.g., *When we went outside* for *Having gone outside*)
4. **Structural changes**
   a. organization (within paragraphs ; within essay)
   b. paragraphing (moving whole paragraphs; creating new paragraphs from existing ones)
5. **Content changes**
   a. addition of new material (e.g., new subject matter or ideas---as distinct from simply adding new words to tighten a phrase or sentence to develop the subject or clarify points)
   b. deleting material (e.g., deleting subject matter or ideas---as distinct from simply deleting words to make a phrase or sentence tighter)
   c. altering an idea, argument, etc. (e.g., changing from pro to con an issue; shifting focus form description to narration)

Note. Adapted from Sze (2002, pp. 35-36) [originally from Faigley and Witte (1981)]

Appendix B: The Coding Scheme for Content of Talk

Categorization of Content		Definition	Example
1	**Procedural**	Utterances referring to task management	"現在開始看文章"/ "let's start =)"/ "do we have to go to my room?"
2	**Social**	Utterances for greeting or leave-taking	"Good morning!"/ "So....let's call it a day~~see you~~~"
3	**Technical**	Utterances related to uses or functions of *POWER*	"按一下refresh應該就看的到了吧"/ "你有看自(字)的顏色有改媽(嗎)"/ "那你要save 我才能看到喔"
4	**Task-related**	Utterances that involved the writing task at hand	
	a. **Content-based**	Utterances about the content (meaning-focused) of the writing task	"But I think that the features about an ideal friend should be added, too."
	b. **Form-based**	Utterances about the form (grammar-focused) of the writing task	"o-oh! You misused the " not only....., but also..." sentence pattern."
	c. **Evaluative**	Utterances that evaluate the writing on the whole	"I really like your writing, particularly the smooth flow and captivating story."
	d. **Others**	Utterances relevant to writing but not specifically to the writing task itself	"老師說阿 寫作時最好有本英英字典"/ "I'm glad that you should have such a good observation!"
5.	**Off-task**	Utterances irrelevant to the task	"我發現只有我門(們)打中文"/ "Could you wait for another 5 minutes?"

Appendix C: The Coding Scheme for Functions of Talk

Coding Categories	Definitions	Examples
1. *Questions*		
a. Request for explanation	Reviewers try to get further explanations of what writers have said or what is not clear to them in the essays (e.g., an unknown term, an idea). This request can be either an explicit question or a statement saying that something is unclear.	"I don't know…What experiment procedure you will discuss? This one of this one?" (reviewer generated) (RG*) or "I didn't understand very well this word."(RG)
b. Comprehension check	Writers ask reviews if they have understood the meaning of a term or idea in the essay. Also, writers and reviewers ask each other if they have understood what has been said.	"Do you know what is parent involvement?" (writer generated) (WG**) or "But tell me first what you understood." (WG)
2. *Explanations*		
a. Explanation of an unclear point in the text	Writers explain the meaning of a term or idea that is not clear to reviewers.	"Oh. Yeah…the procedures about this…yeah…about experiment I have done." (RG)
b. Explanation of opinion	Reviewers or writers explain why they think a given term or idea is not clear and should not be used in the essay.	"OK. And then here you…here for this transition word my is not …very good, because in my conception *in addition* means…you have done project before…and that is important, and this is less important than before subject, so in addition I will have to do something. For example, I want to do this…" (RG)
c. Explanation of the content	Writers explain the subject or the content of their essay to reviewers, that is, what their essay is about.	"My paper is about three reasons of the international…three reasons of the collapse of the international economy order."(WG)
3. *Restatements*	Reviewers or writers restate (summarize or rephrase) what has been written or said to show understanding or reread sections of the essays.	"Ah. I…understand that …that should use both solutions, not problems but solutions." (RG)
4. *Suggestions*	Reviewers or writers suggest ways to change the words, content, and organization of essays.	"Yeah. Maybe…eh…… *furthermore*, *moreover,* or…" (RG)

Note. Adapted from Mendonça & Johnson (1994, p. 769)

*RG = utterance the Reviewer Generates. **WG = utterance the Writer Generates.

專論

A Case Study of Web-based Peer Review for College English Writing

Hsien-Chin Liou

As writing is increasingly recognized by more scholars as a social activity, peer review as a classroom activity has yielded a great amount of research findings. Recently, peer review has been reinvigorated with the enhancement of electronic communication. However, limited studies have been conducted concerning the impact of computer-mediated peer review on the nature of negotiation in the process, students' attitudes, and textual revision. This case study documents the review process of a group of college English learners who used a web-based review platform on three writing tasks. Besides the functions of document management and synchronous chat, the website integrates a Chinese-English concordancer and a collocation program for diction help. The learners went through three cycles of drafting, peer review and revising in pair-work. Evaluation of the group performance included (1) a vocabulary test and a writing task before and after the three cycles of peer reviews, (2) an evaluation questionnaire given after the reviews, and (3) the students' learning process data during the reviews. Results indicate better performance after three rounds of peer reviews. It seems that the experiences of obtaining feedback via online talk, additional knowledge from the two referencing tools for diction, and revision with reflection of the students' own writing through others' eyes may be facilitative for more accurate word use in collocations and connectors, and better writing quality. During the peer review process, some learners would customize the technology to meet their different demands of obtaining needed feedback and revising texts accordingly with content- or form-related concerns. Last, the learners expressed moderate satisfaction with the web-based platform for peer review, but rated the referencing tools more highly than other online functions. The study makes contribution to our better understanding of student-writers, text, and the process in computer-mediated environments.

Keywords: peer review, concordancer, collocation, connectors, web-based learning environment

Hsien-Chin Liou, Professor, Department of Foreign Languages and Literature, National Tsing Hua University