

Email dialogue journaling: attitudes and impact on L2 reading performance

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With the rapid development of technologies, online learning, especially email dialogue journaling, has been playing an increasingly important role in foreign language learning and teaching in recent years. While many studies have examined the effect of email learning on student learning performance, few have looked into students' attitudes towards email application and its impact on their learning outcomes. Positive user attitudes (high self-efficacy) have been considered critical factors that contribute to the subsequent and successful academic performance. By integrating email for the reading learning process, this study developed an electronic-based peer collaborative environment to explore students' attitudes towards email application in reading classes. Specifically, the relationship between students' self-efficacy and their reading performance was examined. The results demonstrate that most students maintain positive attitudes towards the potential outcomes of email application on reading achievement. Furthermore, the feature of electronic discussion has a greater direct effect on the reading enhancement. Implications of certain designs of email tasks for an enhanced second language reading development are presented.

Keywords: Email dialogue journaling; Electronic collaborative learning; Electronic discussion; Reading development

Introduction

With the rapid development of technologies, computers have been playing an increasingly important role in second language learning and teaching in recent years, especially in the area of reading instruction (Warschauer & Healey, 1998). Generally speaking, computer-mediated communication demonstrates a number of advantages in the enhancement of second language learning. One of the distinctive advantages is that computer-mediated communication provides opportunities to promote interactive language learning and authentic use of the target language (Chun, 1994). Such kind of interactive language learning plays an important role of communicative interaction in second language acquisition (Long & Porter, 1985; Pica *et al.*, 1987). In

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addition, computer-mediated communication, which fosters student empowerment and learner autonomy—i.e. students' control of the process of their own learning (Wenden & Rubin, 1987; Warschauer *et al.*, 1994)—is viewed as especially important for language learning. Furthermore, computer-mediated communication demonstrates the importance of social and collaborative factors in second language learning by promoting student motivation and interest in the social-functional use of the target language, and by providing students with a less threatening environment in which to communicate (Barson *et al.*, 1993; Beauvois & Eledge, 1996; Skinner & Austin, 1999).

Among the various forms of computer-mediated communication in language teaching, email has been so far the most popular and useful tool for foreign language teaching and learning (Levy, 1997; Chaffee-Sorace, 1999). Hoffman (1994) maintained the efficiency of email in providing immediate feedback and allowing students to discuss and communicate directly and cheaply with key pals around the world. In other words, email may replace less obvious communicative situations with more genuine and immediate interactions involving real people (Hackett, 1996; Wang, 1998). As Silvia *et al.* (1996) have proved, putting students in contact with audiences and providing them with authentic reasons for communicating in the target language offers a more satisfying foreign language learning experience.

A significant number of EFL teachers believe that email dialogue journaling and interactive computer-mediated communication with a teacher or other individuals are important for foreign language learning. Email dialogue journaling not only opens a new channel for authentic communication, but also provides a less intimidating situation for language development due to everyday exposure; learners writing to their partners have the opportunity to use English at any time within the environment (Peyton, 2000). Since students do not need to compose a message immediately, such delay reduces students' anxiety. Because the interaction is in a written form, it allows learners to use language in a thoughtful way and provides a smooth connection to other kinds of language development (Kupelian, 2001).

Purpose of the study

Although the potential value of email application could provide a natural context for language development with greater access to peers (Peyton, 2000; Kupelian, 2001), almost no attempts have yet been made to examine students' attitudes towards email application and its impact on their learning outcomes. It is considered that positive user attitudes (high self-efficacy) are critical factors that contribute to the subsequent and successful academic performance. The purpose of this paper is to assess the value of incorporating email dialogue journaling for the enhancement of students' reading performance. It is hypothesized that positive effects of using email dialogue journaling to enhance L2 EFL students' reading performance can be observed.

In developing and implementing email dialogue journaling, a number of questions need to be addressed: how should EFL teachers make best use of new online opportunities to maximize language learning while also helping students to develop

computer-based communication and reading skills? What strategies for communicating and networking should students be taught? What kinds of online projects could be collaboratively carried out to accomplish the expected objectives? How could teachers encourage students to present their ideas effectively using email dialogue journaling beyond the confinements of the classroom? To address these questions, the conceptual framework of dialogue journals, online learning and self-efficacy towards email collaborative learning and reading development are presented in this study.

Literature review

Rationale of using a dialogue journal

Before examining the effectiveness of email dialogue journaling and reading development, it is useful to briefly discuss the traditional, conceptual framework of dialogue journals. A dialogue journal is a daily written communication between two persons (Wang, 1998). In the traditional classroom setting, the teacher and the student are the two partners of this dialogue. Stanton (1980) has indicated that the goal of using dialogue journals is to provide a forum for student and teacher to interact in a private setting that eliminates any concern about censorship or evaluation. Such interaction would focus less on concise language structure, but rather on the interaction's content and the thinking underlying the conversation. In 1964, Reed first originated the idea of dialogue journals as a means of promoting authentic, genuine communication between herself and her 6th-grade students. Reed incorporated these journals to better understand the students' needs, to improve classroom discipline, and further involve students in personalized reading and writing activities (Stanton *et al.*, 1987). In the process of the activity, the teacher asked questions, introduced new topics and answered questions. Such an interaction engaged students in reading and writing about topics of their interest and provided students with support and feedback in a less embarrassing or intimidating environment. Since its first discovery as a classroom practice, dialogue journaling has been widely used in EFL classrooms to help students develop their language skills. Numerous researches have since shown that dialogue journaling is an effective way to improve EFL student's second language learning (Gutstein, 1983; Jones, 1988; Reyes, 1991).

Email learning

Today, the communication medium used for dialogue journaling has been replaced by widely available computers; as a consequence, telecommunications have created new opportunities to take dialogue journal writing one step further through the use of email. Email dialogue journaling is similar to dialogue journaling, yet in the latter case, communication occurs via electronic mail instead of through a paper journal (Moore, 1991). Email and other forms of computer-mediated communication have been used for a variety of purposes in second language classes. A study by Warchauer (1996) tested the claim by comparing equality of student participation for two modes:

face-to-face discussion and electronic discussion in the second language classroom. The findings demonstrate a tendency towards more equal participation in the computer mode; shy students were less afraid to participate than in face-to-face discussions. They preferred email to other more intimidating modes of interpersonal communication and interaction.

Another study by Wang (1998) compared dialogue journals within two groups of EFL students. One group used paper and pencil, and the other transmitted information via email. Findings of the study show that a variety of factors exert a positive influence on the participants' attitudes toward email. Limited knowledge about the email system prevents some students from taking full advantage of email as a communication tool. Comparisons of email journals and paper journals reveal that email created a different writing mode than that of paper and pencil. More specifically, Wang found that the email group expressed a stronger desire to communicate with one another, to ask and answers more questions and used a greater variety of language functions than the paper-and-pencil group.

Other studies have indicated that email users tend to ask more questions and seek more information in email writing. Rice and Case (1983) studied the patterns of email communication among email users in a university. They found that the highest uses of email were to exchange information (100%), ask questions (95%), discuss opinions and keep in contact (84%). Grabowski *et al.* (1990) conducted another study on the use of email among graduate students; they revealed that exchanging information (100%) and discussing ideas (63%) comprised the most frequent reasons of using email.

Email dialogue journaling not only translates from one communication to another, but also involves a new way of collaboration in several ways (Shetzer & Warschauer, 2000). Based on Warschauer (1997), such collaboration allows for more in-depth analysis and critical reflection. It also allows students to initiate communication with one another outside the classroom. Several activities have been undertaken to assess the goal of email collaboration. For example, Lloret (1995) distributed tapes of Spanish music for her classes. The students worked on transcribing the songs and posting them to a class discussion list. Other students then wrote to the list to offer their comments or suggestions, or help with the transcribing. The effect was significant in achieving email collaborative learning outside the classroom.

Attitudes and self-efficacy in email uses

Another study (Yu & Yu, 2002) has investigated the impact of incorporating email into a classroom setting on students' academic achievements and attitudes within two groups of students: the email diffusion group and the non-email diffusion group. Results showed that there was a statistically significant difference in their academic performances. The obtained results provide empirical evidence supporting the hypothesis that email as a medium for classroom connection enhances student performance. However, no statistically significant difference was found in student attitudes towards computers.

To date, much of the instrument development has focused on the effect of email application on students' learning performance, neglecting the important construct of self-efficacy. Self-efficacy refers to personal judgements of performance capabilities in a given domain of activity. Students participate in classroom activities with various attitudes and prior experiences, which affect their initial sense of self-efficacy for learning (Schunk, 1985). Kinziek *et al.* (1994) highlight the importance of attitudes as important learning characteristics and precursors of self-efficacy; students who have a low sense of efficacy for acquiring cognitive skills may attempt to avoid tasks, whereas those who judge themselves more efficacious would participate more readily. Schunk's (1981) study further suggested that self-efficacy can be predictive of subsequent academic performance.

To investigate whether students' sense of efficacy towards email exchanges may affect their reading performance, this study designed an electronic-based peer collaborative environment to explore students' attitudes towards email application. Two main questions were addressed: (1) what are students' attitudes towards using email dialogue journaling in a reading class?; and (2) what are the relationship and effect between students' self-efficacy and reading performance?

Methodology

Subjects

The subjects in this study were 40 non-traditional EFL freshmen enrolled in an intermediate reading class at one university in Taiwan. The subjects included 19 males and 21 females, ranging from 23 to 50 years in age, with a mean age of 32. A pre-research questionnaire was administered during the first week of the class to gather information about the subjects' backgrounds. Results from the questionnaire showed that all of the subjects had experienced formal instruction in English for an average of six years by the time they came to study at the university. In their self-assessment, 40% of the subjects ranked their reading ability in English as fair, writing ability in English as fair (43%) and their typing ability as good (30%). Also, 65% of the subjects reported having used word processing previously, and most of them (75%) had used email for personal communication purposes and 86% of them stated that it was their first experience of joining an electronic discussion for formal, academic purposes. Overall, apart from a very few exceptions, this group of subjects had a certain level of computer skills and knowledge, so requiring them to write via email did not cause any problem.

Learning contexts

A process-oriented approach was implemented in the reading course at the institution where the present study was conducted. The objective of the reading course was to help students to understand the content and develop reading and study skills needed to succeed in their studies or in their jobs. In the reading class, students were engaged

in practising a variety of reading skills/strategies, such as previewing vocabulary, predicting reading content, identifying main ideas, skimming for main ideas, scanning for information, making inferences, etc. Besides, the course emphasized the reading of various topics of materials, such as education, city life, business, jobs, lifestyles around the world, global trade, medicine, language and communication, etc. In class, students were encouraged to share their ideas through oral discussions. To further facilitate such a sharing process outside the class, students were told to participate in the email project as part of the course requirements. Students were informed that the specific goal of such activity was to provide an avenue for them to gain greater understanding of different reading materials through peer collaboration via electronic communication. A class mailing-list was then set up in the first week of class. Students had to choose a peer by themselves to post their opinions and comments in writing via email on the assigned article.

Procedure

Students were required to read the assigned material in advance and then individually write down two paragraphs as summaries and personal comments on the selected article. The original plan of the study was to assign three different articles to students to participate in the email tasks. However, after completing the first task with an article on 'Global trade', most students reported verbally to the instructor, who was also the researcher, complaining that they did not have time to join the email project since most of them had jobs during daytime. As a result, only one task had been completed.

After completing the writing task outside class, students sent it to their peer via email, so that students could read one another's writing on-line and give one another feedback and corrections of their writing. All the interactions with their peers—from discussing the article to writing the final draft and anything in between—had been done electronically. Finally, students were requested to hand in their assignments to the instructor electronically at least one day ahead of the next class meeting. To monitor the whole writing process of the week, the instructor received copies of all their correspondences. Students were not only graded on the final product, but also on the process of writing and how well they followed the instructions.

Measurement instruments and data analyses

Calibration of comprehension performance. To investigate students' reading comprehension, Glenberg and Epstein's *Calibration of comprehension performance—reading after testing* (Lin, *et al.*, 2001)—was applied to evaluate how well students understood the reading materials in general. Specifically, five criteria to judge textual understanding were used: (1) confidence in answering questions correctly, (2) easiness of texts, (3) interest quotient of texts, (4) understanding of texts and (5) certainty of answering all the questions correctly (see Appendix 1). The scale ranged from 1 (very poor) to 7 (very good). Students completed a self-assessed questionnaire twice, before (pre-email) and after (post-email) dialogue journaling. They were asked to rate (on a scale

of 1–7) how well they could answer the questions given by the text (Confidence ratings), how easy they found the text (Easiness ratings), how interesting they found the text (Interest quotient ratings), how well they understood the text (Understanding ratings) and how certain they were that they answered all the questions about the text correctly (Certainty ratings).

Specifically, students' calibration of comprehension performance was calculated by computing a one-sample *t*-test technique to compare each measurement scale between pre-email and post-email. Mean and standard deviation, measured by Confidence, Easiness, Interest quotient, Understanding and Certainty scales, were computed to examine their mean differences before and after email dialogue journaling. In addition, the internal consistency of the reliability value was computed.

Survey. A semi-standardized questionnaire consisting of four questions was administered to the students to assess their perception of the effectiveness of the computer electronic integration. The survey was particularly relevant to the interpretation of attitudes and problems of using email dialogue journaling in the reading class. Using an open-ended follow-up format, students were asked (1) whether they liked the process of using email dialogue journaling in the reading class, and why or why not; (2) whether writing emails and getting feedback from their peer had affected their attitude towards reading, and in what way; (3) whether they had improved their reading comprehension via email collaborative dialogue journaling, and why or why not; and (4) whether they had encountered any problems in the process of using email dialogue journaling, and in what way.

To further examine students' attitudes and perceptions of competence (self-efficacy) related to their confidence in doing the email activity, this study hypothesized and employed two features of online communication—i.e. electronic discussion and correction (see Appendix 2). A simultaneous regression was applied to analyse which feature was likely (significant) to cause students' reading enhancement. The features of 'discussion' and 'correction' were designed to be two independent variables, and 'confidence' was the dependent variable. Another treatment was to examine the correlation between 'confidence' (independent variable) and 'reading enhancement' (dependent variable). It is hypothesized that there should be greater direct effects of 'discussion' on 'confidence' and 'reading enhancement' as compared with the effect of 'correction'. The hypothesis path diagram is presented in Figure 1.

Results

Research question 1: What are students' attitudes towards email exchanges in the reading class?

According to the participants' perceptions of email exchanges for the reader, 44% of the subjects pointed out that they liked such an email task because it could ensure their finishing reading the article earlier. One participant stated:

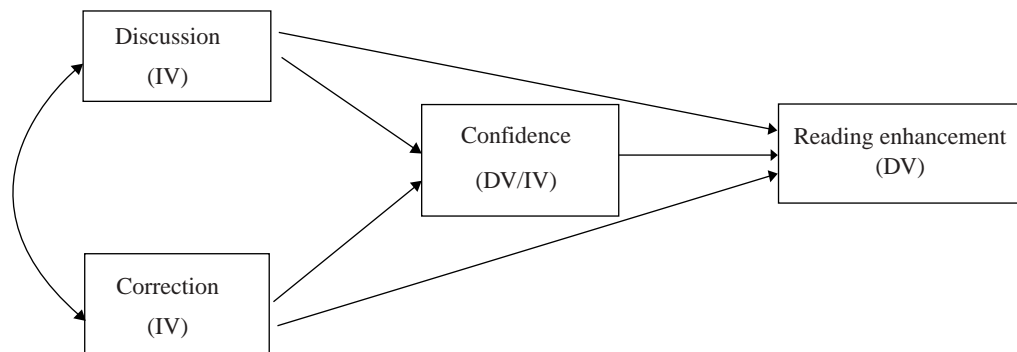


Figure 1. The hypothesis path diagram of discussion, correction, confidence, and reading enhancement.

I didn't use to read the assigned article in advance. However, when I know that my partner is waiting for me to give her some feedback, that kind of incentive motivates me to finish reading the article as early as possible, as well as study it as hard as possible.

Besides, because students could get their peer's opinions and discuss with each other and learn different viewpoints, such brainstorming could enhance the development of their reading comprehension. In addition, another participant said:

By exchanging information, I have more opportunities to practise typing and enhance my computer knowledge.

However, 49% disliked email dialogue journaling because they felt such a task took up too much time since most of them had jobs in the daytime. Poor typing skills, unfamiliarity with the computer and computer non-availability were other complaints. Besides, some stated that they could not accept their peer's criticisms because they did not regard themselves as qualified enough to point out errors or suggests corrections. A few of them were concerned that their corrections reflected their inability to express themselves well in the English language.

With regard to the issue of whether writing emails and getting feedback from their peers had affected their attitude towards reading, 56% of the subjects maintained positive attitudes towards email dialogue journaling with respect to reading improvement. One participant expressed:

Since I can discuss; receive feedback; learn grammar and vocabulary; and get more information from my peer, I get more fun in reading; I consider this way of learning more authentic.

With peers waiting for the discussions, they also pushed themselves harder to read the text earlier, which had improved their reading comprehension. However, 36% of the subjects had an opposite viewpoint; one stated:

My peer's English is poor, so I can't get useful feedback because I don't trust my peer's suggestions; it will negatively influence my writing.

Besides, most subjects claimed that when exchanging information with each other, it really took too much time to get answers. Therefore, they claimed that such

assignments should be done by handwriting instead of computer email journaling since the end-result would be the same.

In answer to the question of whether they had improved their reading comprehension via email collaborative dialogue journaling, 67% of the subjects gave positive comments because, through discussions and collaborative learning, they could read the text repeatedly, thus improving their reading comprehension. To the contrary, 33% had negative viewpoints; they thought that they could understand the text without discussions. One participant stated:

Since I spend too much time in learning how to use computers, I doubt whether I can get the same effect without doing an email project.

Again, because of their peer's poor English, they preferred their teacher's instructions in explaining the text.

In answer to the question of whether they had encountered any problems in the process of using email dialogue journaling, 8% of the subjects mentioned that if computers or servers were out of order, they could not finish their assignment on time; 18% encountered the problem of their peer's non- or late responses; 21% stated that they did not have time to do the task because they had jobs, and therefore they preferred face-to-face discussions; and 23% had poor typing skills, inadequate computer knowledge or no computer available.

Research question 2. What is the relationship between students' self-efficacy and reading performance?

As for the investigation of the five measurement scales, see above, for calibration of comprehension performance, the results in Table 1 show that the mean for the Confidence scale is 3.98 (SD = 1.66, SEM = 0.26). The mean increases to 4.88 (SD = 1.52, SEM = 0.24) after doing the process of email dialogue journaling. Regarding the Easiness scale, the mean before doing the email dialogue journaling is 4.05 (SD = 1.43, SEM = 0.23) and it is 4.73 (SD = 1.40, SEM = 0.22) after it. For the Interest quotient scale, the mean for pre-email is 4.23 (SD = 1.66, SEM = 0.26), and the mean for post-email is 4.63 (SD = 1.43, SEM = 0.23). For the Understanding scale, the mean for pre-email is 4.45 (SD = 1.62, SEM = 0.26), and the mean for post-email is 5.23 (SD = 1.51, SEM = 0.24). For the Certainty scale, the mean for pre-email is 3.85 (SD = 1.53, SEM = 0.24), and the mean for post-email is 4.92 (SD = 1.64, SEM = 0.26). Although the *p*-values are small (near-zero), thus indicating that it could be pointless to carry out such *t*-tests, it is still of importance that the scores of post-email are all higher than those in the pre-email.

The other research results from students' perceived self-efficacy (20 questions related to students' confidence in doing the email project) demonstrate that the alpha value (reliability) is 0.743 for the factor of 'discussion' and 0.798 for the factor of 'correction.' To analyse which factor is likely to cause students' reading comprehension enhancement, the correlation coefficient between 'discussion' and 'correction' is 0.343, which is significant at the 0.05 level. The direct effect of 'discussion'

Table 1. A one-sample *t*-Test analysis for the five measurement scales before and after the email process

Measurement scale	Mean	<i>N</i>	SD	Std error mean	<i>t</i>	df	Sig. (2-tailed)
Confidence							
Pre-email	3.9750	40	1.6562	0.2619	15.18	39	0.00
Post-email	4.8750	40	1.5223	0.2407	20.25	39	0.00
Easiness							
Pre-email	4.0500	40	1.4313	0.2263	17.90	39	0.00
Post-email	4.7250	40	1.3957	0.2207	21.41	39	0.00
Interest quotient							
Pre-email	4.2250	40	1.6562	0.2619	16.13	39	0.00
Post-email	4.6250	40	1.4266	0.2256	20.50	39	0.00
Understanding							
Pre-email	4.4500	40	1.6164	0.2556	17.41	39	0.00
Post-email	5.2250	40	1.5104	0.2388	21.88	39	0.00
Certainty							
Pre-email	3.8500	40	1.5284	0.2417	15.93	39	0.00
Post-email	4.9250	40	1.6391	0.2592	19.00	39	0.00

Confidencescale=>Icouldanswerthelistofquestionsaboutthetext:verypoorly(1)toverywell(7).

Easiness scale = > I found the text: very difficult (1) to very easy (7).

Interesting quotient scale = > I found the text: very uninteresting (1) to very interesting (7).

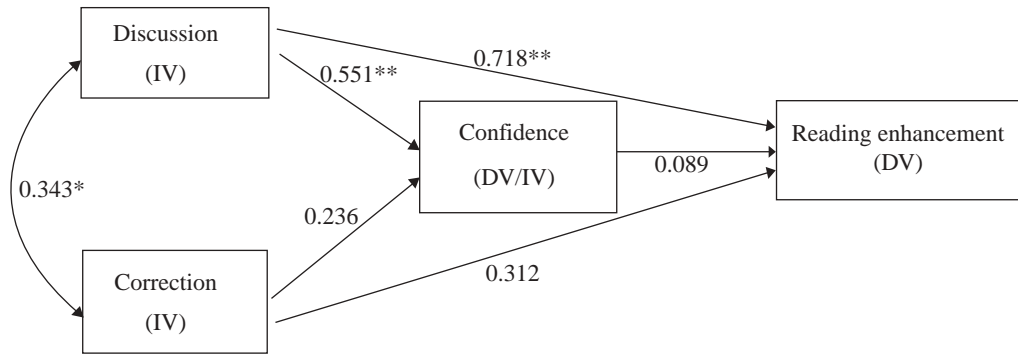
Understanding the scale = > I could understanding the text: very badly (1) to very well (7).

Certaintyscale=>IamcertainthatIansweredallthequestionscorrectly:veryuncertain(1)toverycertain(7).

on 'reading enhancement' as given by the path coefficient is 0.718 (significant at the 0.01 level), while the total of indirect effect is 0.049 (insignificant at the 0.05 level). The path coefficient between 'discussion' and 'confidence' is 0.551 (significant at the 0.01 level). The direct effect of 'correction' on 'reading enhancement' is 0.312 (insignificant at the 0.05 level), while the total of indirect effect is 0.021 (insignificant at the 0.05 level). The path coefficient between 'correction' and 'confidence' is 0.236 (insignificant at the 0.05 level). The 'confidence' scale has a small direct effect on 'reading enhancement', as shown by the path coefficient of 0.089 (insignificant at the 0.05 level). The new path diagram is presented in Figure 2.

Discussion

This study examines the process of email dialogue journaling in relation to students' reading performance. Based on students' self-reports towards email uses, most of them express that it is quite useful to exchange information and discuss ideas with their peers. Such findings support the previous research results (Rice & Case, 1983; Grabowski



*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

Figure 2. The new path diagram of discussion, correction, confidence and reading enhancement.

et al., 1990). That is, most students reveal that exchanging information and discussing ideas are most useful because discussion can be easily supported by the online communication function (Warschauer & Healey, 1998). As noted by Yu and Yu (2002), through fostering a sense of online communication that facilitates collaboration and personal discussion, 'social construction of knowledge among audiences at different locations at different times is realized in the electronic world' (p. 122). However, some students keep negative attitudes about participating in the email activity. The major reason is that they don't have time to do the task; instead, they prefer face-to-face discussions. Such result is different from Warchauer's (1996) study: students who are especially shy would be afraid to participate in the face-to-face discussion; they would prefer email as a way of interpersonal communication and interaction.

To estimate to what extent students' self-reports support the results of the survey, this study investigated (1) mean differences for confidence, easiness, interest quotient, understanding and certainty scales before and after doing the email process; and (2) the degree to which factors including discussion, correction and confidence contribute to students' reading enhancement.

First, to investigate the mean differences of Confidence, Easiness, Interest quotient, Understanding and Certainty scales after doing the process of email dialogue journaling, the results show that students' attitudes towards the five measurements after participating in the email activity are slightly better on average than those before the email activity. It is important for us to highlight that there is a growth for each scale after participating in the email task. Even though the *p*-values are very small for all of those measurements, such *t*-test results may point out that Lin *et al.*'s (2001) view about calibration of comprehension may not be very useful. In other words, based on the *t*-test results, the method of calibration of comprehension performance does little to help us understand whether participation in the email project supports reading development.

Second, within the postulated causal model for assessing self-efficacy, there is some evidence from the path analysis to support the assertion that the effect of electronic

discussion may directly affect students' confidence and reading enhancement because both of them are at the significant level. Electronic discussion especially has a greater direct effect on the reading development. Besides, because those two indirect effects are not significant, this result shows that the effect of electronic discussion and correction on reading development is not mediated by students' confidence. Also, there is a small direct effect of students' confidence on their reading enhancement. On the other hand, the effect of electronic correction is not significant to affect students' confidence and reading development.

According to the above research results, only the students' positive attitudes towards electronic discussion via email affect their learning and reading performance. In other words, because students have positive attitudes towards using email as a tool for learning, such attitudes will enhance their motivation and confidence to acquire knowledge. These findings fit into the literature (Schunk, 1981), which points out that positive attitudes towards self-efficacy may influence the level of learning, and such self-efficacy can also be predictive of subsequent academic performance.

Implications

This study demonstrates that incorporating email into a reading class may positively influence student reading achievement. The findings of this study have implications for the manner in which students enhance their reading performance by designing effective email dialogue journaling tasks. First, the results of electronic correction for the purpose of cooperative learning demonstrate the insignificant effect on reading enhancement, suggesting that the majority of the students consider such activity to be ineffective. The student surveys lend support that some peers' English is too poor to give any comments, so most students may not have the confidence in trusting the suggestions of peers. Although it is not wise to generalize from a one-shot study, its results may give a direction for teachers who would like to use electronic correction in reading classes. That is, since most students feel such practice is not useful, its use should be reduced. Instead, corrections by teachers should be considered appropriate for frequent use in class.

Second, based on self-reports, some students encounter virus problems, a lack of computer knowledge, and limited accessibility to computer hardware and networks. These reasons tend to cause unnecessary anxiety, nervousness, stress or tension. Although the unique feature of electronic communication appeals to some students, it is not appropriate to conclude that email is the tool that should be used by every student in dialogue journaling. Instead, email should be a handy tool for students who are interested in using computers.

Finally, students' attitudes towards electronic discussion (i.e. self-efficacy) have greater direct and positive effects (with $\beta = 0.718$, significant at the 0.01 level) on students' confidence and reading development, suggesting that the feature of electronic discussion via computer-mediated communication is quite effective for students to increase their reading performance. It means that attitudes towards electronic discussion are significant (with the p -results being small) contributors to prediction

of confidence for reading development. The student surveys also support that after discussing ideas and sharing information, students can better understand the text.

Although the findings of the study are largely positive, several limitations should be noted here. First, the subjects of this study were 40 non-traditional EFL students who had jobs during the daytime. The findings are limited to subjects with a profile similar to those participating in this email project. In interpreting the results, we should also bear in mind that the subjects' previous academic backgrounds and ages were varied, which might have affected their reading performance. Second, since the subjects only worked on one task, the limited time and writing assignment for doing the email project was probably not enough to allow for significant improvement. Third, to obtain a more complete picture of the effect of electronic mail on L2 reading performance, a control group (paper-and-pencil group) and an experimental group (electronic group) should be designed properly to analyse their performance differences. In future research, it is suggested that the experiment with two groups should be carried out over more than one task. Consideration of individual learner differences, such as attitude, gender, previous academic background and how such variables may affect the use of an email approach, could lead to future research in foreign language classes.

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Appendices

Appendix 1. Self-assessment to evaluate how well the assigned reading material is understood in general.

Before email dialogue journaling

1. I could answer the list of questions given from the text (Confidence ratings):
Very poorly ... Very well
1 2 3 4 5 6 7
2. I found the text (Easiness ratings):
Very difficult ... Very easy
1 2 3 4 5 6 7
3. I found the text (Interest ratings):
very uninteresting ... Very interesting
1 2 3 4 5 6 7
4. I could understand the text (Understanding ratings):
Very badly ... Very well
1 2 3 4 5 6 7
5. I am certain that I answered all the questions correctly (Certainty ratings):
Very uncertain ... Very certain
1 2 3 4 5 6 7

After email dialogue journaling

1. I could answer the list of questions given from the text (Confidence ratings):
Very poorly ... Very well
1 2 3 4 5 6 7
2. I found the text (Easiness ratings):
Very difficult ... Very easy
1 2 3 4 5 6 7
3. I found the text (Interest ratings):
Very uninteresting ... Very interesting
1 2 3 4 5 6 7
4. I could understand the text (Understanding ratings):
Very badly ... Very well
1 2 3 4 5 6 7
5. I am certain that I answered all the questions correctly (Certainty ratings):
Very uncertain ... Very certain
1 2 3 4 5 6 7

Appendix 2. Self-assessment questionnaire to evaluate confidence about the features of electronic discussion and correction to reading enhancement
Please write down the number from scale 1 (Strongly disagree) to 7 (Strongly agree)

Electronic discussion

1. I think it's useful to discuss with my peer by the process of email dialogue journaling.
2. I learn different viewpoints from my peer by the process of email dialogue journaling.
3. I can understand the article by myself without discussions with my peer.
4. When I know my peer is waiting for my discussion by email, I'll read the article harder for better understanding.
5. For better understanding, I prefer my teacher's instructions.
6. I prefer face-to-face discussions with my peer to the process of email dialogue journaling.
7. I feel confident in understanding the article better after discussing with my peer.
8. My peer can't help me understand the article better after discussion.
9. The more I discuss the article with my peer, the more confident I will be.
10. I think it wastes me too much time to discuss with my peer by the process of email dialogue journaling.

Electronic correction

11. I can't accept my peer's corrections because his/her English is worse than mine.
12. My peer's corrections and suggestions are very useful.
13. I trust my peer's corrections and suggestions.
14. I prefer the teacher's corrections to my peer's.
15. I have problems in correcting my peer's mistakes.
16. If I can't correct my peer's mistakes, I'll check the dictionary.
17. I get nothing from my peer's corrections and suggestions.
18. I feel confident when I correct my peer's mistakes.
19. I can't correct my peer's mistakes because of my poor English ability.
20. When I read my peer's writing from email, I know more about the correct usage of grammar and vocabulary.