# The Effects of Computer-Mediated Communication by a Course Management System (MOODLE) On English Reading Achievement and Perceptions

**Pei-Chin Hsieh and Chang-Ho Ji**
Tzuhui University of Technology, Taiwan
La Sierra University, USA

 **Abstract**
This study compared the effects of three instructional methods—synchronous online communication, asynchronous online communication, and traditional grammar translation method—in English reading comprehension. A quasi-experimental research design included pre and post reading comprehension tests for all three groups and a post perception survey for the experimental groups. After the treatment, synchronous and asynchronous online communication users outperformed those in the independent study group. Yet, no significant difference was found in reading scores between synchronous and asynchronous communication groups. Findings from the post perceptions survey of the experimental groups displayed no statistically significant differences between them.

**Keywords**: Computer-Mediated Communication, MOODLE, EFL, Reading Achievement

## Introduction

The internet is a collection device of gateways and networks that support people to communicate and interactive with one another (Cunnings, Butler, & Kraut, 2002). It provides a networked environment to gather people and students of diverse cultural backgrounds for connecting, sharing, participating, and studying, allowing the computer to become a communication device that changes the way students and teachers communicate (Pennington, 2003). Accordingly, Forsyth (1998) contended that the internet has transformed the means of traditional instruction and has become a supplemental tool to support current instruction and learning.

Thereby, computer-mediated communication (CMC) has long been thought of as a critical means to recognize interactivity in virtual teaching and learning surroundings. CMC creates a learning approach involving student-centered interaction that helps learners to engage in a climate of negotiation as well as generate socio-cultural awareness and promote cognitive development (Zhao & Lai, 2008). Wild and Braid (1996) also contended that online-based activities through communication encourage learners to cooperate to complete tasks instead of competing as communicative activities in virtual settings motivate learners to increase the frequency of interaction and collaborative activities with others.

## CMC and Language Learning

CMC has also become the critical component and process in language learning (Mercer, Fernandez, Dawes, Wegerif, & Sams, 2003). The processes of CMC encourage cognitive activities that facilitate learner acquisition of language knowledge through interactive talk and scaffolding (Zhao & Lai, 2008).

According to Kidate (2000), CMC offers a positive learning environment because it has the characteristics of linguistic support and interaction to cultivate second language acquisition in L2 learners. In the process of CMC, learners interact to exchange ideas and share information. In the theory of language acquisition, learners can produce target language output after acquiring sufficient input. Therefore, the virtual learning community can help learners acquire a target language through a sequence of input stimuli from others, scaffolding that helps them to improve their own language competency and opportunity to progress gradually in order to generate output performance. A CMC setting, Johnson (2008) stated, allows learners to monitor individual performance through text-based online interaction for self-correcting. Thus, online communication can enhance the motivation to participate and reduce the anxiety (Kidate, 2000) that often comes from the affective domain in language acquisition.

In this context, the potential benefit of CMC on English learning is easily conceivable. For example, according to Davis and Thiede (2000), employing authentic communication via written English in CMC is popular in the writing research field. Computer networks affect a multicultural environment in which English learners can do both creative and interactive writing. In an online environment, learners employ text-based forms to interact with partners and, through peer-response activities, enhance their writing development (Shudooh, 2003). Language learners can contact people worldwide through the Internet. Users from different areas use English to

communicate with one another and support learners studying via various people who have different cultural backgrounds (Pennington, 2004; Shudooh, 2003). An online environment motivates learners to use the target language to write using active thinking instead of memory and to think about major points in the content (Brain, 2008). Others' feedback in the online setting also helps learners construct written English through revising drafts and following suggestions (Walled, 2006). This activity generates confidence and interest in writing effectively more than the traditional class does (Shudooh, 2003).

For writing, CMC can generate a climate that is non-threatening because virtual settings allow learners to spend more time preparing content and considering responses carefully before they compose reflections. Therefore, CMC supports learners in constructing language learning while reducing psychological barriers. In addition, appropriate employment of CMC can reportedly promote English writing in the areas of grammar (Salaberry, 2001), pragmatics, and communicative competence (Zhao & Lai, 2008). Learners interact in computer-mediated communication that facilitates their acquisition of certain syntax and linguistic structures from others.

**Synchronous vs. Asynchronous**
The above discussion stresses the positive effects of computer-mediated discussion delivered by course management systems (CMSs) in promoting English writing skills (Shudooh, 2003; Walled, 2006). The present paper extends to this line of writing research, exploring the effects of computer-mediated discussion on English reading as presented in a course management system.

As for writing, authentic interaction through CMC is likely to generate meaningful English reading experiences. Students spend time in a virtual setting engaged with English reading tasks and contexts that motivate them to develop depth of cognition for comprehension. Online discussion requires learners to share ideas with friends, an activity that fosters reading skills to a higher degree than solitary reading activities do (Postlethwaite & Ross, 1992).

Besides, the present study goes one step further to compare the effects of two types of CMC on English reading comprehension: asynchronous and synchronous communication (Sotillo, 2000). Asynchronous communication is a delayed synchronous communication in that messages may not be conveyed from senders to receivers immediately (Blake, 2000). Meanwhile, synchronous communication is immediate online interaction. It requires individuals to meet online at the same time and require sufficient visual and/or audio equipment.

Asynchronous text-based communication such as e-mail and discussion boards can facilitate meaningful reading in hypertext. There are advantages of using e-mail in language learning. It offers a "wonderful sense of audience (Blake, 2000, p. 34)" In addition, language learners may be more willing to risk communicating and, through writing scripts, avoid the terror and risk of face-to-face communication (Warschauer, 1995). Frequent e-mail is also known to lead to writing improvement (Davis & Thiede, 2000) because it offers time for learners to consider lexical and syntactical usage and complexity. Asynchronous CMC can also promote vocabulary growth and reading skills, (Li, 2000) and develop intercultural communicative competence (Levy & Stockwell, 2006).

Dissimilar to asynchronous CMC, learners' English proficiency needs to reach certain levels for synchronous communication to generate meaningful interaction (Im & Lee, 2004). The written and spoken forms of synchronous communication involve some of the same features as oral discourse to negotiate meaning (Levy & Stockwell, 2006). As a result, "discourse as the social construction of reality sees texts as communicative units which are embedded in social and cultural practices" (Paltridge, 2006, p.9). The features that are found in face-to-face communication are clarification requests, comprehension checks, compensatory strategies, confirmation checks, self-correction, and word invention (Blake, 2000). CMC's online social climate promotes and motivates learners to more advanced thinking and communication. Synchronous CMC also provides immediate feedback and more efficiency than asynchronous communication and is not restricted by time or space.

Similarly, real-time chat, in view of Braine (2008) and Donaldson and Haggstrom (2006), promotes the development of higher thinking skills in learners through collaborative writing activities. Synchronous chat makes writing necessary and, as a virtual communicative setting, has the potential to produce a motivating, supportive, and anxiety-free climate. In real-time chat, learners can experience various language usages and learn much from online partners that experience reciprocal results via this real communication (Braine, 2008).

Based on this array of research, the present study

compares the effectiveness of asynchronous and synchronous CMC on EFL students' reading comprehension using one free course management system (Moodle). As stated above, asynchronous and synchronous CMC have different functions and purposes in the online learning environment. Asynchronous communication requires EFL learners to process delayed interaction but provides them sufficient time to consider syntax and lexical usage before producing text-based language output. On the other hand, synchronous communication is an immediate language interaction that may present less accuracy than asynchronous communication. However, synchronous communication can increase learners' motivation more than asynchronous communication can (Levy & Stockwell, 2006; Skehan, 1998). No research has taken place comparing the effects of asynchronous and synchronous CMC on the reading achievement of EFL learners.

**Methodology**
The samples in this study were members of three classes chosen from Taiwanese EFL students at a college in southern of Taiwan. The 138 participants in this study were divided into three groups. Students in the first group ($n = 46$) were provided the instrument of computer-mediated asynchronous discussion on Moodle and collaborative discussion reading contexts with partners. Students in the second group ($n = 45$) were given the instrument of computer-mediated synchronous discussion on Moodle to work with others on assigned reading materials. In the third group, students ($n = 47$) were assigned traditionally used independent study in reading tasks.

This research was conducted during the fall semester of 2008 at the designated College. The experimental research procedures were as follows. Firstly, all three groups were given a mock TOEIC reading comprehension pre-test. All class content was designed to follow the same lesson plans for all three groups: teaching schedule, materials, and climate in the classrooms were standardized to meet research expectations. Yet, the first and second groups were additionally trained in the regulations and strategies needed to use Moodle for computer-mediated synchronous and asynchronous discussion at the school's computer lab. The experiment was conducted for twelve weeks. During the period, the researchers assigned different strategies, synchronous communication, asynchronous communication, and independent study, for each group's after-class study. The two experimental groups, synchronous and asynchronous communication, were required to use computer-mediated discussion on Moodle. The third group was given the traditional independent reading assignments and teaching strategies. Lastly, all three groups took the same mock TOEIC reading comprehension test at the end of the twelve weeks of instruction.

The first and second groups took a comprehensive survey reflecting on their perceptions concerning computer-mediated discussion and Moodle as a learning platform in their learning experience. The control group having been assigned no computer-mediated communication was not given the perception survey.

The perception questionnaire was comprised of six subscales. The first section tapped learners' perceptions of computer-mediated synchronous or asynchronous discussion in reading study related to reading proficiency influence, collaboration and interaction, and general perceptions in computer-mediated communication. Next, learners' enjoyment and motivation in computer-mediated synchronous or asynchronous discussion were assessed. Finally, learners' perceptions of Moodle in relation to the online discussion process made up the third section. The questions were adopted from four difference resources and redrafted before employment (Wu & Hiltz, 2004; Shudooh, 2003). A four-point Likert-type scale was applied to rank each question: strongly disagree = 1, disagree = 2, agree = 3, and strongly agree = 4. Students mark one of these to represent their perceptions for each item.

Regarding variables, TOEIC reading comprehension scores in the post-test were used as the dependent variable. The TOEIC pretest of reading ability was used as the covariate to adjust the scores. For the predictors, the three different instructional methods consisted of the primary predictor variable. In addition, the samples' demographics information was also collected: gender, age, years of English learning, age when English learning started, and individual computer skills.

**Results**
To explore the differences in pre and posttest TOEIC reading scores, one-way ANOVA analysis was first adopted. The results showed no significant differences in pretest scores. The data revealed language proficiency of the three groups before the experiment: synchronous online communication (*M*

= 50.43), asynchronous communication ($M$ = 46.89), and independent study by grammar translation ($M$ = 45.53). Based on these results, the three groups had similar reading proficiency before the quasi-experimental research.

Next, the researchers employed analysis of covariance to determine the differences in post reading scores among the three groups using TOEIC reading scores as covariates. Once the effect of reading pretest scores was controlled, a significant group difference, $F$ (2, 134) = 6.395, $p$ < .05, was found in subjects' reading posttest scores. The results display achievement differences for those using various learning models: synchronous communication ($M$ = 73.61), asynchronous communication ($M$ = 68.33), and independent study by grammar translation ($M$ = 57.94). The findings demonstrate that the subjects in synchronous communication performed better on the reading section of TOEIC than did the control group. The asynchronous communication group also performed better than independent study ones. Yet, there was no statistically significant difference between the synchronous and asynchronous online groups.

The researchers next employed multiple analysis of covariance to estimate the differences of the synchronous and synchronous communication group on the six subscales of computer-mediated discussion. The results showed the multivariate main effect for both synchronous and asynchronous groups on all six attitudes' subscales—reading proficiency influence, collaboration and interaction, general perceptions, and the enjoyment in CMC and motivation in CMC, and employment of Moodle in the reading study process, Wilks lambda = .83, $F$(1, 89) = 2.86, $p$ < .05.

Finally, multiple regression analysis was used in that reading posttest scores was regressed to six perceptual subscales to estimate the implication of perceptions on reading posttest scores. The results showed that the model significantly predicted TOEIC reading posttest scores, $F$ (13, 77) = 26.78, $p$ < .001. $R^2$ for the model was 0.79, and adjusted $R^2$ was 0.76.

For parameters, learners' reading pretest scores accounted for 32% of variance in learners' posttest scores and had effect on the predication. Hence, subjects who had higher reading pretest scores outperformed others on reading posttest scores. Further, the direction of gender indicates that females performed better than males in reading, explained 31% of total variance in learners' reading posttest scores. Additionally, the direction of subjects' age, meaning sophomores outperformed freshmen in

posttest scores, accounted for 25% of total variance in posttest scores. Besides, regarding the direction of individual computer skills, participants who had above average computer skills performed better in posttest scores than who were weaker, that predicting 24% of total variance in reading posttest scores.

Concerning predictors, three variables predicted TOEIC reading comprehension posttest scores to a statistically significant level. Collaboration and interaction in computer-mediated discussion predicted 45 percent of total variance in the reading posttest. Participants' perceptions in CMC explained 32 percent of total variance in reading posttest scores. Similarly, learners' perceptions toward Moodle in the learning process accounted for 31 percent of total variance in reading posttest scores. In conclusion, this finding demonstrates that subjects who had more positive attitudes toward collaboration/interaction, general perceptions, and Moodle use in the process of computer-medicated communication tended to get higher TOEIC reading posttest scores.

**Conclusion**

Based on the previous discussion, some specific, noteworthy results were found in this research. In this study, synchronous and asynchronous online communication improved reading posttest scores better than traditional English learning methods. Yet, no significant differences existed between synchronous and asynchronous groups in relation to their effects on English reading comprehension. Both modes of communication seem to be equally effective in increasing reading comprehension and achievement.

In addition, this study reveals that participants in the synchronous communication group had no better perceptions of CMC than those in the asynchronous communication group. Yet, both groups showed similar positive perspectives toward two of the subscale domains, collaboration in CMC and effects of CMC, both of which proved effective in supporting improvement in reading posttest scores. Further, the present study displays evidence that the course management system, Moodle, provided the tools to sustain online communication and carry out learning goals. Participants' positive perceptions of Moodle were significantly related to enhance reading comprehension posttest scores.

In sum, the findings are supported by previous research in the effects of computer-mediated communication. These studies demonstrated that computer-mediated communication can become an

effective tool to facilitate the processes of reading skills building and comprehension development. Further, the course management system (CMS) Moodle can be a constructive tool to support the learning process as can other CMSs with functions similar to those of Moodle.

**References**

[1] G. Braine, "Teaching Second and Foreign Language Writing on LANs," In S. Fotos and C. M. Browne (eds.), *New Perspectives on CALL for Second Language Classrooms,* Mahwah: Lawrence Erlbaum, pp. 93-108, 2008.

[2] J. N. Cunnings, B. Butler, and R. Kraut, "The Quality of Online Social Relationship," *Association for Computing Machinery. Communications of the ACM, p.* 103, 2002.

[3] B. Davis and R. Thiede, "Writing into Change: Style Shifting in Asynchronous Electronic Discourse," In M. Warschauer and R. Kern (eds.), *Newtork-based Language Learning*, Lisse: Swets & Zeitlinger, pp. 13-27, 2000.

[4] R. P. Donaldson and M. A. Haggstrom, *Changing Language Education through CALL.* New York: Routledge, 2006.

[5] I. Forsyth, *Teaching and Learning Materials and the Internet*. Sterling, VA: Stylus, 1998.

[6] Y. Im and O. Lee, "Pedagogical implications of Online Discussion for Preservice Teacher Training*,"* *Journal of Research on Technology in Education,* pp. 155-170, 2004.

[7] G. Johnson, "The Relative Learning Benefits of Synchronous and Asynchronous Text-based Discussion," *British Journal of Educational Technology,* pp. 166-169, 2008.

[8] K. Kitade, "L2 Learners' Discourse and SLA Theories in CMC," *Computer Assisted Language Learning*, pp. 143–166, 2000.

[9] M. Levy and G. Stockwell, *Call Dimensions: Options and Issues in Computer Assisted Language Learning.* Mahwah: Erlbaum, 2006.

[10] Y. Li, "Linguistic Characteristics of ESL Writing in Task-based E-mail Activities*," System*, pp. 229-245, 2000.

[11] N. Mercer, R. Dawes, R. Wegerif, and C. Sams, "Reasoning as a Scientist: Ways of Helping Children to Use Language to Learn Science," *British Educational Research Journal*, pp. 367-385, 2003.

[12] B. Paltridge, *Discourse Analysis: Introduction*. London: Continuum, 2006.

[13] M. C. Pennington, "The Impact of the Computer in Second Language Writing," In B. Kroll (ed.), *Exploring the Dynamics of Second Language Writing*, New York: Cambridge University, pp. 287-310, 2004.

[14] T. N. Postlethwaite, and K. N. Ross, *Effective Schools in Reading: Implications for Educational Planners. An Exploratory Study,* Hague: International Association for the Evaluation of Educational Achievement, 1992.

[15] M. R. Salaberry, "The Use of Technology for Second Language Learning and Teaching," *The Modern Language Journal,* pp. 39-56, 2001.

[16] Y. M. Shudooh, "Application of Computers in Developmental Writing Classes," Doctoral Dissertation, University of Cincinnati (UMI No. 3093396), 2003.

[17] P. Skehan, *A Cognitive Approach to Language Learning*. Oxford, England: Oxford University Press, 1998.

[18] S. M. Sotillo, "Discourse Functions & Syntactic Complexity in Synchronous and Asynchronous Communication," *Language Learning and Technology,* pp. 82-119, 2000.

[19] M. Warschauer, *E-mail for English Teaching: Bringing the Internet and Computer Learning Networks into the Language Classroom.* Alexandria: TESOL, 1995.

[20] A. G. Walled, "College ESL Students' Attitudes and Beliefs about Computer-assisted Writing Class," Doctoral dissertation, Indiana University of Pennsylvania (UMI NO. 3215779), 2006.

[21] M. Wild and P. Braid, "Children's Talk in Cooperative Groups," *Journal of Computer Assisted Learning,* pp. 216-231, 1996.

[22] D. Wu and S. R. Hiltz, "Predicting Learning from Asynchronous Online Discussions," *Journal of Asynchronous Learning Networks*, pp. 139-152, 2004.

[23] Y. Zhao and C. Lai, "Technology and Second Language Learning: Promises and Problems. In L. L. Parker (ed.), *Technology-mediated Learning Environments for Young English Learners: Connections in and out of School,* New York: Erlbaum, pp. 167-206, 2008.