THE EFFECT OF COMPUTER-MEDIATED FEEDBACK ON SECOND LANGUAGE READING COMPREHENSION

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ABSTRACT

The purpose of this study is to assess the potential of computer-mediated feedback for improving second language (L2) reading comprehension. To fulfill the purpose of the study, 60 upper-intermediate learners of English were randomly divided into two groups of experimental and control groups. The subjects of the experimental group were asked to read 8 prose passages, which ranged between 280 and 310 words in length, and answer multiple-choice questions after they have read each passage. Participants received immediate feedback in the form of Answer-Until-Correct (AUC) feedback for multiple-choice items. Results indicated the students who received the computer-mediated feedback improved their reading comprehension significantly compared to their peers in the control group who did not receive feedback.

Key words: multiple-choice test, Answer-Until-Correct feedback, L2 reading comprehension.

INTRODUCTION

Feedback is an essential component in the learning and explains the gaps in knowledge and understanding, providing for reflection and development. Feedback at its best is pivotal in the learning and assessment process (Orrell, 2006). Research on how students perceive feedback, and what aspects of feedback are most valued by students, is providing insight into how best to provide feedback to maximize its usefulness in evaluation and in transforming learning (Orsmond et al., 2005).

For feedback to be most effective, it should be appropriate and timely (Ramsden, 1992). In the context of feedback on assessment tasks, this means within a timeframe that allows students to recall their responses and the understanding that informed their decisions. Shute (2008) defined feedback as the information communicated to the learner to modify his or her thinking or behavior for the purpose of improving learning, and then agreed that providing students with timely feedback is important.

Now, with our electronic age, most feedback is converted to digital and online environments. Feedback provided through online assessment programs offers several advantages over the feedback provided by instructors. Specifically, computer-mediated feedback can provide immediate feedback on individual responses regardless of class size or the time at which an

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International Journal on New Trends in Education and Their Implications
January, February, March 2011 Volume: 2 Issue:1 ISSN 1309-6249

assignment is completed, and this feedback can remain unbiased, accurate, and non-judgemental, irrespective of student characteristics or the nature of the response (Mandernach, 2005).

Despite the fact that models and guidelines recommending pedagogically sound practices for incorporating Internet-based materials exist (e.g., Brandl, 2002; Chun & Plass, 2000) major concern is that the number of such examples remains limited. Likewise, guidelines for offering a reading course via the Internet are similarly few. However, evidence exists to support the assumption that integrating reading with computer-mediated support improves ESL students' reading skills (e.g., Chun & Plass, 1996; Williams & Williams, 2000). Accordingly, this study attempts to bridge this gap by examining the impact of computer-mediated feedback on improving reading comprehension among upper-intermediate ESL students.

FEEDBACK IN CALL

Wager and Wager (1985) defined feedback in computer-based instruction as "any message or display that the computer presents to the learner after a response". Two commonly used feedback formats in CALL studies are verification only feedback and elaborative feedback (Kulhavy & Stock, 1989). Verification is the simple judgment of whether an answer is correct or incorrect while elaboration is the informational component providing relevant cues to guide the learner toward a correct answer (Mandernach, 2005).

The verification feedback can be given in the form of knowledge of response (indication of whether the answer was received and accepted by the system), knowledge of results (KR) (information about correctness or incorrectness of the response), or knowledge-of-correct response (KCR) (presenting of the correct answers) feedback.

The elaborative feedback can address the topic and/or the response, discuss the particular errors, provide worked examples or give gentle guidance. In the elaborated feedback (EF) the system presents not only the correct answer, but also additional information – corresponding learning materials, explanations, parts of problem-solutions etc.

Answer-Until-Correct (AUC) is a common form of elaborative feedback which provides students with the correct response by having them continue responding until they select the correct answer. Answer until correct feedback is also known as multiple try feedback (MFT). MFT requires students to make multiple tries at answering the same item if and with the added knowledge that their previous or initial response was incorrect.

PREVIOUS STUDIES

There are a number of studies that investigated the effectiveness of computer-based feedback on L2 acquisition. Nagata (1996), for example, investigated the impact of intelligent computer feedback and paper-based feedback on developing learners' grammatical skill in producing Japanese particles and sentences. The results of the study indicated significant differences in the performance of students who received intelligent computer feedback in comparison to students who received paper-based feedback.

Research conducted by Persky and Pollack (2008) also found significant differences in performance (test scores) between students who received Elaborative computer-based feedback in the form Answer-Until-Correct for their errors in comparison to the students who did not received feedback. However, Clariana' (2000) study in contrast to Nagata (1996) and,

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Persky and Pollack (2008), found no significant learning effect for students who received Elaborative computer-mediated feedback on their errors. Nevertheless, Ferris (2003) explains how indirect feedback, or Elaborative feedback from a CALL perspective, is generally thought to be conducive to long-term student development; it forces students to think about their own errors and self-correction, thereby leading to: " ... increased student engagement and attention to forms and problems" (p. 52).

ANSWER-UNTIL-CORRECT METHODOLOGY

To gain a picture of readers' understanding of a text researchers and instructors measures comprehension after the reading is complete, and some of the most widely used comprehension assessment measures are multiple choice questions, written recalls, close tests, sentence completion, and open ended questions. The most common comprehension test is multiple-choice questions (Brantmeier, 2003).

While most multiple-choice testing requires test takers to select one answer and move on to the next question, the answer-until-correct method forces learners to select answer choices until the correct answer is chosen. A positive aspect of this method is that the last answer the learner makes is the correct one and the ability to continue through the instruction may function as reinforcement. Also, the learner may engage in more effortful thinking before the first response because it avoids the item being re-presented and delaying progress through the program.

THE PRESENT STUDY

The present study is an attempt to investigate the effect of computer-mediated feedback on the reading performance of L2 students. The results of this study will be of crucial importance in ESL teaching by equipping teachers and students with computer-mediated feedback knowledge to promote learning process.
The research was designed to answer the following question:
RQ: What is the effect of computer-mediated feedback on the reading performance of l2 learners?

Experimental Design
Participants

The study was conducted in a foreign language education department at an Iran university. Sixty upper-intermediate students (60 females) participated in the study. They volunteered to participate in this study.   The participants were randomly assigned either to the experimental group or to the control group. Each group consisted of 30 subjects. They ranged in age from 18 to 20.

Procedure

One week before the study, an Oxford Placement Test was administered to the volunteers. This test was administered to the 98 ESL learners to indicate their English proficiency level of which 60 upper-intermediate ESL students were selected and divided into two groups (i.e., experimental group, n= 30 and control group, n= 30). A thirty minute session was held prior to the main research to familiarize the experimental group with the process of taking computer-based tests and receiving feedback. The treatment sessions were held twice a week.

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During the treatment sessions, the participants in the experimental group were required to read 8 passages which were selected from GRE, TOEFL, and SAT study guides. Microsoft Word was used to display information about the reading level of the reading passage. Readability of the passage was administered in order to be able to determine the appropriate readability of the passage for the upper-intermediate level. The readabilities within the ranges of 30-49 were considered as appropriate for the participants on the basis of the readability level of their English book.

Each passage consisted of 280–310 words of text organized into four paragraphs. Four facts were identified in each passage (one fact per paragraph) to serve as the to-be-tested information. For testing purposes, each fact was transformed into a question and correct response and three plausible incorrect responses were developed to serve as multiple-choice lures. The "eGrade On-Line Assessment System" was used to present all the materials and collect responses. Participants received immediate feedback in the form of answer-until-correct feedback for multiple-choice items. After 4 treatment sessions, for investigating the effect of computer-mediated feedback on the comprehension of the texts during treatment sessions, all students were given 15 minutes to complete a final comprehension test .

Immediately after the administration of the final test, a background questionnaire was administered to gather demographic information about the subjects. The questionnaire also had a section asking the subjects to rate the usefulness of computer-mediated feedback. Within 2 days after the administration, semi-structured interviews of 6–8 min were conducted with the subjects . The goal was to gather supplementary data about their experience with computer-based tests and receiving feedback. The researcher asked for clarification and elaboration when the subjects responded with short answers or nods.

Computer-mediated Feedback: Participants received immediate computer-mediated feedback in the form of AUC feedback for multiple-choice items. The AUC feedback treatment provided for an incorrect answer, "No, try again" and for the correct answer, "That's correct". This feedback was displayed at the bottom of the screen. After the third try, the learner was told "Right" if correct or "Wrong" if incorrect, and then the student was shown the correct answer by means of an arrow.

RESULTS AND DISCUSSION

Results obtained by participants in the final test were compared for the both experimental and control groups in order to determine the effect of computer feedback on reading comprehension outcomes. The final test scores, the means and standard deviations of the experimental and control groups were calculated and a t-test was used to test the significance of the difference between the performance averages of the groups.

Table 1
Means and Standard Deviation Obtained in Final Tests

	groups	N	Mean	Standard. Deviation	Std. Error Mean
Score	Group 1	30	7.73	1.50	.27
	Group 2	30	6.26	1.59	.29

Table 1. shows group statistics. From this we can see that $\bar{X}$ = 7.73 and SD = 1.50 (experimental group), and $\bar{X}$ = 6.26 and SD = 1.59 (control group).

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January, February, March 2011 Volume: 2 Issue:1 ISSN 1309-6249

Table 2
Independent Samples T-Test in final tests

Score		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference
	Equal variances not assumed	3.09	.95	3.66	58	.001	1.46	.40
	Equal variances assumed			3.66	57.81	.001	2.46	.40

The results of the t-test, provided in table 2, revealed the difference between groups was statistically significant at the significance level of .05. Since the two-tailed significance value of .001 is less than alpha = .05, there is a significant difference between the two groups. This difference is graphically indicated in Figure 1.
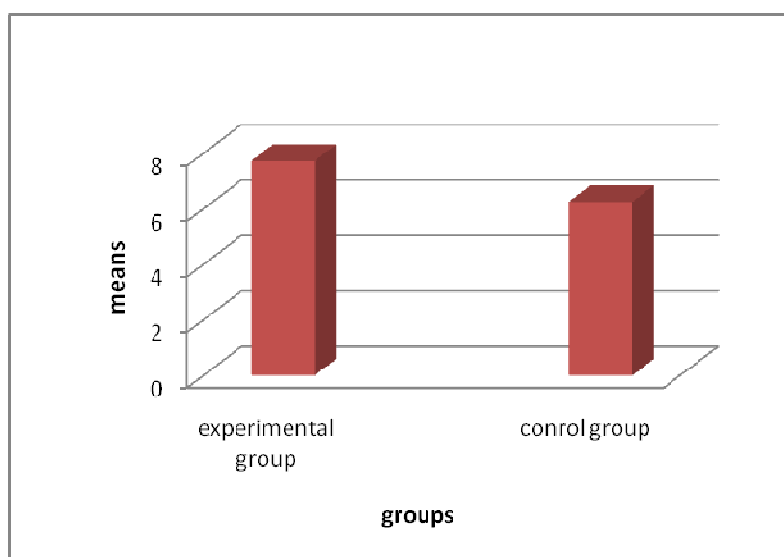

Figure 1: Comparison of means obtained in final tests by two groups

In sum, the quantitative analysis of the results in this research showed that the students who received the computer-mediated feedback improved their L2 reading comprehension significantly compared to students who did not received any feedback. The results of the study confirmed previous research conducted by several researchers that providing computer-mediated feedback has a positive effect on the performance of students (e.g. Nagata, 1996; Persky & Pollack, 2008).

The findings of the study also suggest that feedback can be valuable tool for supporting student learning when used properly. Research stresses the need to provide timely and appropriate feedback that can help a student improve reading comprehension. A computer, which allows instructors to provide immediate feedback in a variety of ways may be used to future enhance instructor's ability to provide useful and timely feedback to students.

The qualitative analysis of data also suggested that the students preferred the immediate feedback format, and that they preferred it over almost every other testing method to which they had been exposed previously. The two main reasons cited for this preference was the immediate knowledge of success or failure and the ability to make multiple attempts to ascertain the correct answer. The students also indicated that the format of the examination forced them to rethink some problems and therefore increased their comprehension of topics for which they did not demonstrate initial mastery, that is, corrected any misinformation.

CONCLUSION

To conclude, the results of the study indicated that the group who received the computer-mediated feedback in the form of AUC feedback improved their reading comprehension significantly compared to the students in the control group who did not receive any feedback. The results also indicated that providing timely and appropriate feedback   was effective in student's L2 reading comprehension. Furthermore, through the study it became evident that the students preferred AUC method because it allows students to re-work or re-think their mistakes, potentially resulting in deeper earning.

Limitations and Suggestions for Further Research

This study poses several limitations; thus, the findings should be considered with caution. First, the target population of the study consisted of upper-intermediate level language learners of English. This study should be replicated in other learning contexts with students from different proficiency levels to generalize findings to a larger target population and to different learning environments. Second, this study controlled for gender. A similar study could investigate the effect of computer-mediated feedback on L2 reading comprehension of male students. Third, the study only considered of one type of computer-mediated feedback (AUC) and not other types of computer-based feedback. It is suggested that similar studies be conducted with other types of computer- mediated feedback. Finally, the present study was conducted with a small sample size and short duration of the experiment. Future studies are needed to replicate this study with larger sample size sand longer periods of time.

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International Journal on New Trends in Education and Their Implications
January, February, March 2011 Volume: 2 Issue:1 ISSN 1309-6249

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REFERENCES

Brandly, K. K. (1995). Strong and weak students' preferences for error feedback option and responses. *The Modern Language Journal*, *79*, 194–211.

Brantmeier, C. (2003). Technology and second language reading at the university level: Informed instructors' perceptions. *The Reading Matrix: An International Online Journal*, *3,* 50–74.

Chun, D. M., & Plass, J. L. (1996). Facilitating reading comprehension with multimedia System, 24, 503– 519.

Chun, D. M., & Plass, J. L. (2000). Networked multimedia environments for second language acquisition. In M. Warschauer and R. Kern (Eds.), Network-based language teaching: Concepts and practice (pp.151–170). New York: Cambridge University Press.

Clariana, R. B. (2000). Feedback in computer-assisted learning. NET g University of Limerick Lecture Series. Retrieved September 24, 2010, from http://www.personal.psu.edu/faculty/r/b/rbc4/NETg.htm

DiBattista, D., Mitterer, J.O., & Gosse, L. (2004). Acceptance by Undergraduates of the Immediate Feedback Assessment Technique for Multiple-Choice Testing. *Teaching in Higher Education*, *9,* 17–28.

Ferris, R. D. (2003). Response to student writing: Implications from second language students. Mahwah, NJ: Lawrence Erlbaum Associates.

Hong, W. (1997). Multimedia computer-assisted reading in business Chinese. Foreign Language Annals, 30, 335–344.

Kulhavy, R. W., & Stock, W. A. (1989). Feedback in written instruction: The place of response certitude. *Educational Psychology Review*, *1*, 279–308.

Mandernach, B. J. (2005). Relative effectiveness of computer-based and human feedback for enhancing student learning. *Journal of Educators Online, 2*, 1–12.

Orrell, J. (2006). Feedback on learning achievement: rhetoric and reality. *Teaching in Higher Education, 11,* 441–456.

Orsmond, P., Merry, S., & Reiling, K. (2005). Biology Students' Utilization of Tutors' Formative Feedback: A Qualitative Interview Study. *Assessment and Evaluation in Higher Education, 30,* 369–386.

Persky, A.M. & Pollack, G.M. (2008). Using answer-until-correct examinations to provide immediate feedback to students in a pharmacokinetics course. American Journal of Pharmaceutical Education, *72,* 1–7.

Ramsden, P. (1992). *Learning to teach in higher education.* London: Routledge.

Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research, 78,* 153–189.

Wager, W. and Wager, S. (1985). Presenting questions, processing responses, and providing feedback in CAI. *J. Instructional Development*, *8,* 2–8.

Williams, H. S., & Williams, P. N. (2000). Integrating reading and computers: An approach to improve ESL students reading skills. Reading Improvement, 37, 98–100.

Computer-assisted language learning (CALL) is an approach to language teaching and learning and the best way to learning in the future. Computer-assisted language Learning (CALL) is an approach to teaching and learning in which the computer and computer-based resources such as the Internet are used to present, reinforce and assess material to be learned. It usually includes a substantial interactive element. It also includes the search for and the investigation of applications in language teaching and ELLs' reading comprehension can be influenced by their vocabulary knowledge, word recognition skills, understanding of text structure, oral English language proficiency, and cultural background differences (Klinger & Geisler, 2008; Francis et al., 2006). Vocabulary knowledge has been shown to be highly related to ELLs' reading comprehension ability (Klinger, et al., 2006). DiCecco and Gleason (2002) examined the effect of graphic organizers on the learning of relational knowledge from social studies texts for 24 students with LD in middle school. Computer-mediated glosses had an overall medium effect on second language reading comprehension and a large effect on incidental vocabulary learning. Mean effect sizes varied from medium to large depending upon the level of instruction, text type, and assessment tasks. Several attempts to synthesize studies investigating the effects of glossing on vocabulary learning from reading have already been made in earlier meta-analyses (Abraham, 2008;Vahedi et al., 2016;Yun, 2011; see also Taylor, 2006Taylor, , 2009Taylor, , 2013Taylor, , and 2014 for effects of glossing on reading comprehension). computer based instruction, problem solving, critical thinking, language. A b s t r a C t. 1. What are the effects of the reading comprehension software intervention on the reading ability of students? 2. Will increased performance with reading comprehension have a collateral effect on students scoring higher with math word problems? 3. Is it possible for reading comprehension skills to be transferred to other academic areas, specifically in mathematics? The intervention for this research aimed to improve reading comprehension by targeting language structures and modeling. The computer-based instructional program selected for this study cultivated progress in critical thinking and reading comprehension skills that would likely transfer to other academic areas.