English Language Teaching; Vol. 5, No. 12; 2012
ISSN 1916-4742 E-ISSN 1916-4750
Published by Canadian Center of Science and Education

The Effect of Gloss Type and Mode on Iranian EFL Learners' Reading Comprehension

Karim Sadeghi[1] & Negar Ahmadi[2]

[1] School of Literature and Humanities, Urmia University, Iran

Correspondence: Karim Sadeghi, English Language Department, Urmia University, Urmia 165, Iran. E-mail: k.sadeghi@urmia.ac.ir

Received: August 24, 2012 Accepted: September 15, 2012 Online Published: October 23, 2012

doi:10.5539/elt.v5n12p100 URL: http://dx.doi.org/10.5539/elt.v5n12p100

Abstract

This study investigated the effects of three kinds of gloss conditions that is traditional non-CALL marginal gloss, computer-based audio gloss, and computer-based extended audio gloss, on reading comprehension of Iranian EFL learners. To this end, three experimental and one control groups, each comprising 15 participants, took part in this study. In order to ensure that the participants were from the right proficiency level, KET (Key Language Test) was used to select upper-intermediate proficiency learners. Participants in each group read two passages under one of the three mentioned conditions, with no gloss offered for control group. They all completed one pretest, one reading session, and one post-test. The data were analyzed using t-tests and one-way ANOVA. Statistical analyses of the results revealed that extended audio gloss group, who were provided with the voice of a speaker to read the meaning of the target word, as well as one example sentence, significantly outperformed the other groups. The results of this study provide some insights for teachers and administrators to review their curricula, approaches, and educational tools, and to consider the possibility of incorporating CALL technology into their teaching.

Keywords: audio gloss, extended gloss, gloss types, multimedia gloss, reading comprehension

1. Introduction

1.1 Statement of the Problem

Reading is a basic and complementary skill in language learning. Second language students need to learn to read for communication and to read greater and greater quantities of authentic materials (Chastain, 1988). Reading is undoubtedly one of the important factors which should be regarded seriously while learning a foreign language. Since EFL (English as a Foreign Language) learners live in a context in which English is not spoken, reading is the main source of language input for most of them.

Good reading texts are models for writing. Reading also has a positive effect on students' vocabulary knowledge, on their spelling and on their writing (Harmer, 2007). Moreover, reading is considered an important skill especially for academic success. Among all the four skills in English (i.e., speaking, writing, listening, and reading), reading is a top priority in the English curricula at schools and universities in most countries.

Indeed, the reading goal is to heighten comprehension. As it has been rightly pointed out by Harmer (2007), the meaning, that is, the message of the text, is important in reading. Because of the importance of this skill, there are naturally many ways to improve the ways the students read and comprehend a passage (Khalaji & Vafaeeseresht, 2012). They have changed the classroom activities hoping to improve the reading comprehension. Many factors play a role in FL (Foreign Language) reading comprehension. The most important ones are L1 (First Language) literacy, top-down and bottom-up strategies, background knowledge, various reading skills (e.g. summarizing, identifying the main idea, distinguishing between facts and opinions), and vocabulary knowledge (Egbert, 2005). Vocabulary, however, plays the most important role in reading comprehension.

It is a widely held belief that a greater variety of lexical items and in particular lower frequency words often appear in written language. Such words can present stumbling blocks to learners (Brown, 2001). Since learners may face some problems in reading, there should be different reading text enhancement for improving vocabulary learning and understanding of text.

Nation (2009) observed that not all texts for extensive reading need to be simplified texts as there are other ways of helping with vocabulary load of extensive reading. These include glossing, computer- assisted reading, and elaborating. The term gloss refers to an explanation or a definition of words written on margins in reading passages that helps learners readily work out the meanings of the words (Shiki, 2008). While, the use of a glossary may be beneficial in this regard, it is not appreciated in course books.

Although, there are some studies on the effects of different conditions of gloss on reading comprehension (e.g., Al-Seghayer, 2001; Rott & Williams, 2003; Ariew & Ercetin, 2004; Bowles, 2004; Ko, 2005; Sakar & Ercetin, 2005; Akbulut, 2008; Shalmani & Sabet, 2010; AbuSeileek, 2011, etc.), very little is known about the effects of audio gloss and extended audio gloss. This study was accordingly an attempt to delve more into the issue of glossing in reading. Accordingly, reading comprehension enhanced with three conditions of gloss (i.e., non-CALL marginal gloss, audio gloss, and extended audio gloss) were investigated in this project. Marginal gloss provides information about the glossed word in the margin of the same page. An audio gloss often uses the voice of a native speaker to read the word, or to read a sample sentence containing the target word, or to read the meaning of the target word (Marzban, 2011). Extended audio gloss employs audio gloss plus L2 English example sentence.

1.2 The Significance of Research in this Area

ESL and EFL students are a population who need special attention in reading development, especially those who wish to pursue academic work in their second language (Taghavi & Sadeghi, 2008). When learners confront an unfamiliar word in the text they read, they may choose the wrong meaning from dictionary, or have an erroneous guess. This means that, in a language, words can mean more than one thing. With so many available meanings for one word, gloss can help the learner to determine which of them is being referred to. Thus, it is a way of making meaning absolutely clear and a way of enhancing reading comprehension.

This study aimed to investigate what kinds of gloss were more beneficial for learners. It is expected that the findings can shed light on reading comprehension. What a good teacher should do is to help students facilitate reading comprehension by making use of the glosses. It also provides information for Computer Assisted Language Learning (i.e., CALL) reading comprehension materials designers in choosing the appropriate combination of different kinds of glosses in facilitating reading comprehension. Moreover, teachers and dictionary designers may benefit from the findings of the study.

Many studies have been done on the effects of glosses on reading comprehension. Compared to other research studies on gloss, this study looks at audio-glass, the literature on which is very scant. There is also a new gloss type defined for this study (extended gloss) which is totally new to gloss research area. The important role that glossary play in reading comprehension, and the problems that Iranian EFL learners have with reading highlight the significance of the present study.

Thus, by focusing on different forms of the glosses, this research attempted to provide a more detailed description of the influence of glosses on reading comprehension. Given the observation that research in this field is very limited in Iran, it can become a reference for Iranian researchers to carry out further studies.

1.3 Review of the Related Literature

Nation (2009) believed that glosses may improve comprehension of the text, although the research on this is not conclusive. Some studies have examined the effects of textual glossing on reading comprehension (e.g. Ko, 2005; Cheng & Good, 2009).Cheng and Good (2009) carried out a study on the effects of 3 kinds of glosses—first-language (L1) Chinese glosses plus second-language (L2) English example sentences, L1 in-text glosses, and L1 marginal glosses—in comparison with a no-gloss condition in reading an English passage. Unexpectedly, reading comprehension did not improve significantly.

Currently, the use of technology is becoming more and more prevalent around the world. It has also found its way into classrooms. Multimedia facilitates the applications of computers in foreign language education by providing audio-visual presentations and interactions tailored to the needs and interests of different individuals or groups of learners (Rezaee and Sharbafshoar, 2011). Some studies (Lomicka, 1998; Al-Seghayer, 2001; Rott& Williams, 2003; Ariew&Ercetin, 2004; Bowles, 2004; Ko, 2005; Sakar&Ercetin, 2005; Akbulut, 2008; AbuSeileek, 2011; Marzban, 2011; Park & Kim, 2011; Tabatabaei& Shams, 2011; Zandieh&Jafarigohar, 2012) have confirmed the contributions of multimedia glosses to reading comprehension.

Lomicka (1998) explored the way multimedia annotations might have affected the level of comprehension. The participants were 12 college students in a second-semester French course. Learners were asked to read a text under one of three conditions: full-gloss condition, limited-gloss condition, and no-gloss condition. The

experiment showed that computerized reading with full glossing led to a deeper understanding of the reading passage.

Marzban (2011), in a study, investigated the effects of audio/video annotation on reading comprehension of EFL learners. To carry out the research, he chose 68 pre-intermediate level students who were randomly divided into multimedia- and paper-based conditions. Their age range was between13 to18. Two reading texts were chosen to be administered. In multimedia group, during reading and answering the questions, the participants clicked the words to access available glosses, either audio (pronunciation) or videos. The other group received the same text in paper. A multiple-choice reading comprehension test was used to assess the learners' reading comprehension. The results of independent sample *t*-test indicated that the multimedia group outperformed the other group.

Although the results of these studies differ as to precisely which types of multimedia annotations are best for reading comprehension, they all suggest their positive impact. Research conducted on exploring the effect exerted by different kinds of glosses, especially audio gloss, on reading comprehension is also scarce. As it was stated in the previous section, in those few studies about audio gloss, the pronunciation of target words, instead of definition of them, is provided to the readers. But, gloss, by definition, refers to meaning of an unfamiliar word somewhere near the text. Lastly, there is a new gloss type defined for this study (extended gloss) which is totally new to gloss research area. In this kind of gloss, the reader has access to audio gloss coupled with L2 English example.

1.4 Research Questions

This study aimed to answer the following research questions:

Does exposure to non-CALL marginal L2 gloss affect Iranian upper-intermediate EFL learners' reading comprehension?

1. Does exposure to audio gloss affect Iranian upper-intermediate EFL learners' reading comprehension?
2. Does exposure to extended audio gloss affect Iranian upper-intermediate EFL learners' reading comprehension?
3. Are there any differences between exposures to non-CALL marginal gloss, audio gloss, and extended audio gloss on Iranian upper-intermediate EFL learners' reading comprehension?

2. Methods

2.1 Design of the Study

The independent variable in this study was the treatment conditions (i.e., non-CALL marginal gloss, audio gloss, extended audio gloss, and no gloss), and reading comprehension was the dependent variables, while gender was regarded as the control variable. This study used an intact pre-test/post-test quasi-experimental design. Since randomization of individuals was not feasible in the current study, the engaged four intact classes were arbitrarily assigned to three experimental and one control groups. Two of the treatment groups received software for reading section; one of them had access to paper-based marginal gloss; and the control group received traditional reading instruction with no gloss. The outcomes of the reading comprehension test of four groups were compared to determine whether there were significant differences between the performances of the already mentioned groups.

2.2 Participants

To accomplish the objectives of the study, 60 male EFL learners at upper-intermediate proficiency level, within the age range of 17-21, took part in the study. They were learning English as a foreign language at ACECR language institute (Jahad-e-Daneshgahi) in Urmia, Iran. In order to ensure that the participants were from the right proficiency level, KET (Key English Test) was utilized to select upper-intermediate proficiency learners. The analysis of the obtained data from the proficiency test revealed the mean score of 62.32, 62.10, 61.82, and 62 for the first, second, third, and fourth groups, respectively. After the analysis of the obtained data from the proficiency test, four of the participants got low scores in comparison to others and consequently, they were excluded from the study. The rest of the participants enjoyed similar proficiency level and were therefore eligible to serve as the participants of the study. The participants were also assessed based on their knowledge of the target words in the study. Unfamiliarity with the final pool of 10 target words in each text constituted the second criterion for participant selection.

The participants were semi randomly assigned into 4 groups: non-CALL marginal gloss group (i.e., Group1), audio gloss group (i.e., Group 2), extended audio gloss group (i.e., Group 3), and control group (i.e., Group 4). Thus, the performances of 60 participants in three experimental and one control group, each comprising15

learners, were compared.

2.3 Instruments

Six instruments were used in this study as explained below.

2.3.1 Proficiency Test

To guarantee participants' homogeneity in terms of their language proficiency, the Key English Test (KET) was employed. This instrument was used as a reliable and valid test for the selection of 60 participants out of 64 learners. The KR-21reliability of the test was found to be 0.81.

2.3.2 Background Information Questionnaire

The second data elicitation tool was a questionnaire to elicit some demographic information about the participants' age, educational background, and computer literacy. The information coming from the last part was needed for Groups 2 and 3; because, the participants of these two groups needed to work with computer in class.

2.3.3 Multiple-choice Reading Comprehension Test

The third instrument was a teacher-made test of reading comprehension used as a post-test.It comprised 10 multiple-choice questions about each text. The testwas piloted with 17 upper-intermediate EFL learners from the same language institute. For each item, the participants had to select the correct word from among 4 choices. The KR-21reliability of the reading comprehension test was found to be 0.81. Two specialists in language teaching and testing were asked to review the tests. There was a general consensus among them concerning the content validity of the test. Hence, the test enjoyed a good degree of reliability and validity. Also, test administration required 30 to 45 minutes for each text.

2.3.4 Target Words Test

In selecting the target words, three steps were taken to ensure that words were unfamiliar to participants. First, the teacher selected 14 marked words which were believed by her as unknown to participants. Then, a pilot study was conducted to identify the unknown words. Ten words among the 14 marked ones were identified as unfamiliar by the participants. A list of words of target wordswas also given to the participants and the teacher asked them to mark those that they knew. Those words that were unknown for the majority of participants were regarded as unknown target words. The glossed words appeared in bold during treatment; thus, the participants' attentions were drawn to the target words.

2.3.5 Reading Texts

The selection of English reading texts as well as the selection of target words was crucial to ensure validity of the experiment. Two reading texts, of narrative nature and of about 300 words each, from Summit 1Bby Saslow and Ascherwere (2006) selected for the experiment. They were titled "Protecting our natural inheritance" and "Compulsive shopping: the real cost". The participants would study these reading texts the next term. Each text contained 10 unknown words.

2.3.6 The Program

The main instrument of the study was presenting two unseen passages with three different types of glosses. In the first experimental group, the participants had access to paper-based L2 marginal glosses. The left section of the screen was used for reading the text and the right section was used for glossing. In the second one, the participants were provided with audio gloss, using CALL technology. In the third experimental group, they had access to audio gloss as well as L2 English examples. The control group received the same texts in traditional way, that is paper-based, with no glosses. They were not allowed to use their dictionaries while reading the texts. Moreover, the teacher did not provide the meaning of the words for the participants. In this study, the focus of gloss was on L2 definition of the words.

2.4 Procedure

The first step in the process of conducting the research was that the teacher explained what the learners in each group were supposed to do during the tasks. She made sure that they understood the instruction by making use of modeling.

The next step was the administration of KET as the homogenizing tool. It was administered to 64 upper-intermediate EFL learners who constituted three intact classes. Due to the lack of the time, the proficiency test was administered in three sessions: reading and writing in a single session, listening and speaking in two different sessions. In order to ensure the reliability of the test scores for the speaking part, another teacher was asked to provide his own scores for each participant and hence the inter-rater reliability was checked. Since four

of the learners got very low scores on proficiency test, they were regarded as outliers and their performance was not taken into account in the analysis of the final data. Then, a semi-randomization procedure was used and four intact classes were randomly assigned to three experimental groups and one control group, each consisting 15 participants.

After proficiency test, the participants were surveyed about age, years of using the computer, and years of studying English. Afterwards, the pre-test was administered to the participants to measure their prior knowledge about the target words. Test administration required 15 minutes for the pre-test of vocabulary. When the pre-test was checked, it was found that they did not know the meaning of any of the words as they appeared in context. Two weeks later, the participants read two short, unseen passages. They read the same pieces of text but with different gloss condition for each group: paper-based L2 marginal gloss, audio gloss, and extended audio gloss. The control group received the same passages in traditional way, that is, paper-based, with no gloss. Then, they were required to answer one multiple choice reading comprehension question. During reading in the post-test, the participants, in audio and extended audio gloss groups, clicked the words to access available glosses. Also, test administration required 30 to 45 minutes for reading comprehension.

2.5 Data Analysis

The data, in this study, were analyzed using SPSS version17 (Statistical Package for Social Sciences) software. On the basis of the aforementioned research questions, the data were analyzed using one-way ANOVA for text comprehension in immediate post-tests for research questions 4. In order to understand whether three aforementioned gloss conditions were more effective than traditional reading condition, that is to answer research questions 1, 2, and 3, three separate independent samples *t*-tests were used.

3. Results

In this section, the relevant data analysis is presented based on which the above questions of the study are given answers.

3.1The Results of Proficiency Test

To ensure the homogeneity of the participants in all groups, the Key English Test (KET) was employed. To compare the performance of the participants in the intact classes, a one way ANOVA was run. The first table presents the descriptive for these intact classes.

Table 1. Descriptive statistics for the pre-test proficiency test

	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
first class	15	62.32	7.78	1.91	42	73
second class	15	62.10	7.00	1.28	43	76
third class	18	60.82	5.00	1.32	31	65
fourth class	16	61.74	6.05	1.50	64	80
Total	64	61.74	6.45	.88	31	76

To check the homogeneity of variances, the significance value is checked and since it is 0.47 which is greater than 0.05, the assumption is not violated (Table 2).

Table 2. Test of homogeneity of variances for pre-test

Levene Statistic	df1	df2	Sig.
.99	2	44	.47

Since the assumption of the homogeneity of variances is not violated, in the next step, it is checked that whether there is any significant difference between the present groups or not. As it is demonstrated in Table 3, there is no significant difference at the $p < .05$ level in pre-test scores for the four intact classes: $F (2, 44) = .27$, $p = .72$. This result demonstrates that groups are of equal language proficiency at the beginning of the study.

Table 3. ANOVA for pre-test scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.16	2	10.50	.27	.72
Within Groups	1910.39	44	33.33		
Total	1935.55	46			

However, the box plot shows that four of the participants got low scores in comparison to others. These participants were excluded from the study as outliers (Figure 1).

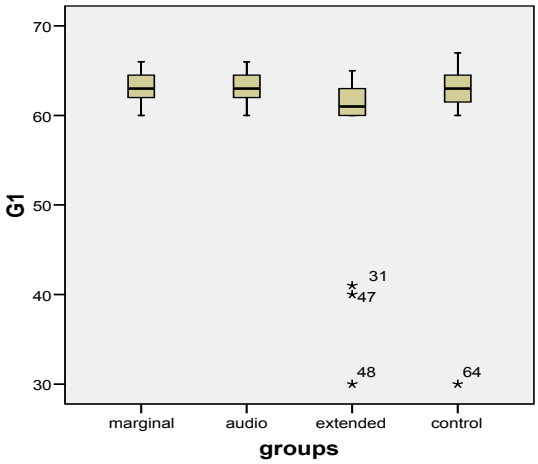

Figure 1. Box plot for Pre-test

3.2 Marginal Gloss Group's Performance on Immediate Post-test of Reading

The first question of the study concerned investigating whether exposure to non-CALL marginal L2 gloss affects Iranian upper-intermediate EFL learners' reading comprehension. To clarify the effect of non-CALL marginal L2 gloss on reading comprehension of the participants, an independent t-test was conducted on reading comprehension post-test scores. Table 4 indicates the means and standard deviations for marginal gloss group and control group in post-test. As the comparison of the means across groups shows, Group 1 (M = 6.47) performed better than Group 4 (*M*= 5.27).

Table 4. Descriptive statistics for marginal gloss and control groups' scores in post-test of reading

	Glosstype	Mean	Std. Deviation	Std. Error Mean
posttest of vocabulary retention	marginal gloss	6.47	.990	.256
	no gloss	5.27	1.43	.37

The results of independent samples t-test, as illustrated in Table 5 , shows that there was a significant difference between the scores of the participants who had access to marginal gloss and those who did not; t (28) = 2.66, p = .013 .

Table 5. Independent samples t-test on marginal gloss and control groups' scores in post-test of reading

	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
Post-test of reading Equal variances assumed	.894	.353	2.662	28	.013	1.200	.451
Equal variances not assumed			2.662	24.847	.013	1.200	.451

Therefore, in response to the first research question that was seeking the effect of using marginal gloss on upper-intermediate EFL learners' reading comprehension, we can conclude that using marginal gloss has a significant effect on reading comprehension scores.

3.3 Audio Gloss Group's Performance on Immediate Post-test of Reading

The second question of the study concerned investigating whether exposure to audio gloss affects Iranian upper-intermediate EFL learners' reading comprehension. To clarify the effect of the aforementioned gloss on the participants' reading comprehension, an independent t-test was run on reading comprehension post-test scores. Table 6 indicates the means and standard deviations for audio gloss group and control group in the post-test. As the comparisons of the means across groups shows, Group 2 (M = 6.73) performed better than Group 4 (M = 5.27).

Table 6. Descriptive statistics for audio gloss group and control group scores in post-test of reading

	glosstype	Mean	Std. Deviation	Std. Error Mean
post test of reading comprehension	audio gloss	6.73	.884	.228
	no gloss	5.27	1.438	.371

The results of independent samples t-test, as illustrated in Table 7 , shows that there was a significant difference between the scores of the participants who had access to audio gloss and those who did not; t (28) = 3.36, p = .002 .

Table 7. Independent samples t-test on audio gloss and control groups' scores in post-test of reading

	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
Post-test of reading Equal variances assumed	1.930	.179	3.366	28	.002	1.467	.436
Equal variances not assumed			3.366	23.259	.003	1.467	.436

So, in response to the second research question that was seeking the effect of using audio gloss on EFL learners' reading comprehension, we can conclude that using audio gloss has a significant effect on reading comprehension scores.

3.4 Extended Audio Gloss Group's Performance on Immediate Post-test of Reading

The third question of the study concerned investigating whether exposure to extended audio gloss affects Iranian upper-intermediate EFL learners' reading comprehension. To clarify the effect of this condition of gloss on the participants' reading comprehension, an independent *t*-test was conducted on reading comprehension post-test scores. Table 8 indicates the means and standard deviations for extended audio gloss group and control group in post-test. As the comparison of the means across groups shows, Group 3 (*M* = 7.87) performed better than Group 4 (*M* = 5.27).

Table 8. Descriptive statistics for extended audio gloss and control groups scores in post-test of reading

	glosstype	Mean	Std. Deviation	Std. Error Mean
post test of reading comprehension	extended audio gloss	7.87	1.060	.274
	no gloss	5.27	1.438	.371

The results of independent samples t-test, as illustrated in Table 9 , shows that there was a significant difference between the scores of the participants who had access to extended audio gloss and those who had not; t (28) = 5.63, p = .000 .

Table 9. Independent samples t-test on extended audio gloss and control groups' scores in post-test of reading

	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
Post-test of reading Equal variances assumed	.741	.397	5.638	28	.000	2.600	.461
Equal variances not assumed			5.638	25.751	.000	2.600	.461

In response to the third research question that was seeking the effect of using extended audio gloss on the learners' reading comprehension, we can conclude that using this kind of gloss has a significant effect on reading comprehension scores.

3.5 Groups' Performance on Post-test of Reading Comprehension

The fourth question of the study concerned investigating the effects of traditional non-CALL marginal gloss (i.e., Group 1), audio gloss (i.e., Group 2), and extended audio gloss (i.e., Group 3) on the participants' performance on reading comprehension.

A one-way between-groups analysis of variance (i.e., ANOVA) was employed to explore the effects of three conditions of gloss (i.e., traditional non-CALL marginal gloss, audio gloss, and extended audio gloss) on the participants' performance on reading comprehension compared to a no gloss control group. Table 10 illustrates the descriptive statistics of the four groups' scores on text comprehension. The difference among the means of the gloss groups and control group showed that the extended audio gloss group (M = 7.87, SD = 1.06) outscored the marginal gloss group (M = 6.47, SD = 0.99), audio gloss group (M = 6.73, SD =0.88), and control group (M = 5.27, SD = 1.43) on comprehension of L2 texts.

Table 10. Descriptive statistics for the post-test scores of reading comprehension

Gloss type	Mean	Std. Deviation	Std. Error
marginal gloss	6.47	.990	.256
audio gloss	6.73	.884	.228
extended audio gloss	7.87	1.060	.274
no gloss	5.27	1.438	.371
Total	6.58	1.430	.185

The result of ANOVA, as illustrated in Table 11, shows that there was a significant difference between the scores of the participants in four groups.

Table 11. Analysis of variance for gloss types

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	51.250	3	17.083	13.798	.000
Within Groups	69.333	56	1.238		
Total	120.583	59			

Post-hoc comparisons using the Tukey HSD test (see Table 12) indicated that the mean score for marginal gloss group (M = 6.47, SD = 0.99) was significantly different from extended audio gloss group (M = 7.87, SD = 1.06) and control group (M = 5.27, SD = 1.43). The mean score for audio gloss group (M = 6.73, SD = 0.88) was also significantly different from extended audio gloss group (M = 7.87, SD = 1.06) and control group.

Table 12. Post-hoc tests on experimental and control groups' scores in post-test of reading comprehension

(I) glosstype	(J) glosstype	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
marginal gloss	audio gloss	-.267	.406	.913	-1.34	.81
	extended audio gloss	-1.400(*)	.406	.006	-2.48	-.32
	no gloss	1.200(*)	.406	.023	.12	2.28
audio gloss	marginal gloss	.267	.406	.913	-.81	1.34
	extended audio gloss	-1.133(*)	.406	.035	-2.21	-.06
	no gloss	1.467(*)	.406	.004	.39	2.54
extended audio gloss	marginal gloss	1.400(*)	.406	.006	.32	2.48
	audio gloss	1.133(*)	.406	.035	.06	2.21
	no gloss	2.600(*)	.406	.000	1.52	3.68
no gloss	marginal gloss	-1.200(*)	.406	.023	-2.28	-.12
	audio gloss	-1.467(*)	.406	.004	-2.54	-.39
	extended audio gloss	-2.600(*)	.406	.000	-3.68	-1.52

In response to the fourth research question that strived to investigate the effects of traditional non-CALL marginal gloss (i.e., Group 1), audio gloss (i.e., Group 2), and extended audio gloss (i.e., Group 3) on the participants' performance on reading comprehension, we can conclude that extended audio gloss group significantly outperformed the other groups in terms of reading comprehension.

4. Discussion

Thus, regarding research questions 1, 2, 3, and 4, which asked whether there are any differences between control groups and those with exposure to non-CALL marginal gloss, audio gloss, and extended audio gloss on reading comprehension of Iranian upper-intermediate EFL learners, the results indicated that extended audio gloss group, who were provided with the voice of a speaker to read the meaning of the target word as well as with one example sentence, significantly outperformed the other groups in terms of reading comprehension. Furthermore, as far as reading comprehension is concerned, the three gloss groups outperformed the control group. Therefore, glosses, either traditional or multimedia, have significant effect on the comprehension of a written text. This finding is in line with the findings of Davis (1989), Jacobs, DuFon, and Hong (1994), Lomicka, (1998), and Bowles (2004). Likewise, in the present study, multimedia and traditional gloss groups, who were exposed to glosses, had an advantage over the control group in reading comprehension. Also, comprehension of the text was highly enhanced by audio gloss and one example sentence as provided by extended audio glosses.

The reason for this finding of the study could be that providing learners with different modes of gloss presentation can assist the learners to process information through different channels allowing participants to better comprehend the text (Mayer, 2001). Language learners might find extended audio gloss useful in that it provides further information about key words. This study supports using a variety of modes of gloss in reading texts. Studies have reported the superiority of a combination of audio, picture, and video in comparison to text only when presenting new knowledge (Mayer & Moreno, 1998). This research favored the use of the extended audio gloss as the most effective type of vocabulary annotation aiding in reading comprehension. The present finding is in line with those ofLomicka (1998), Ko (2005), Cheng and Good (2009), and Marzban (2011) who suggested that gloss has positive effect on reading comprehension.

Marzban (2011) compared the effects of audio/video annotation used by 68 pre-intermediate level students who were randomly divided into multimedia and paper-based conditions. Multimedia gloss group significantly performed better than paper-based condition group. In his study, the pronunciation of the words was provided for the participants.

5. Conclusion

The findings of the present study demonstrated first that extended audio gloss group comprehended online computerized L2 texts significantly better than other groups. Second, all experimental groups performed better than the control group in text comprehension. The present study offers clear evidence that utilizing computers and multimedia glosses can be influential in language teaching in general, and online computerized L2 text comprehension in particular.

The implications of these findings provide insights for how teachers can assist students improve their EFL reading abilities. Since improving text comprehension was the overarching goal of the study, teachers, who try to make their classes as varied as possible, may rely on CALL to enhance the learning experience for language learners. Hence, one of the implications is for teachers. As such new technologies are added to the classes, learners will have higher level of motivation.This study has also some implications for material designers. They can prepare appropriate CALL programs which may promote learning, and subsequently those programs can be used in language classrooms for enhancing reading comprehension. They can provide texts with different kinds of glossing. They can also provide new educational tools, incorporating different kinds of technologies into the teaching environments. Furthermore, the findings of this study can be integrated into the institution or university syllabuses where reading is considered to be an important skill and objective.

There are some limitations in the current study, which should be taken into consideration in any attempt to generalize these results. First concerns the limited duration of the study. The goals of this study were to investigate the use of a new medium for reading. Therefore, the optimal classroom setting would be to allow as much time as students desired. Another limitation of the study is related to limited number of passages used. This study also controlled for gender. Moreover, participants of the multimedia groups did not have access to one computer individually due to the limited resources of the institution. The proficiency test to ensure the homogeneity of the learners was administered in three different sessions, which might have influenced learners' performance. It was better to conduct the test in one session. Finally, in order to create a suitable environment for a reading lesson, environmental variables should also be minimized. Among the environmental variables that could be contributed to the different performance of the participants are noise, temperature, adequacy of light, time of day, and seating arrangements (Brown, 1988).

Acknowledgments

We would also like to thank Jahad-e-Daneshgahi's managers to permit us to conduct the research in that institute.

References

AbuSeileck, A. F. (2011). Hypermedia annotation presentation: the effects of location and type On the EFL learners' achievement in reading comprehension and vocabulary acquisition. *Computer and Education, 57,* 1281-1291. http://dx.doi.org/10.1016/0360-1315.57.2.1281

Akbulut, Y. (2008). Predictors of foreign language reading comprehension in a hypermedia Reading environment. *Journal of Educational Computing Research, 39*, 37-50.

Al-Seghayer, K. (2001). The effect of multimedia annotation modes on L2 vocabulary acquisition: A comparative study. Language *Learning & Technology, 5,* 202-232. Retrieved from http://llt.msu.edu/vol5num1/alseghayer/default.pdf

Ariew, R., & Ercetin, G. (2004). Exploring the potential of hypermedia annotations for second language reading. *Computer Assisted Language Learning Journal, 17*, 237–259.

Bowles, M. A. (2004). L2 glossing: To CALL or not to CALL. *Hispania, 87,* 541-552.

Brown, H. D. (2001). *Teaching by principles: an interactive approach to language Pedagogy* (2nd ed.). London: White Plains, NY: Pearson Education.

Brown, J. D. (1988). Understanding research in *second language learning*. Cambridge: Cambridge University Press.

Chastain, K. (1988). *Developing second language skills: Theory and practice* (3rd ed.). Chicago: HBJ.

Cheng, Y., & Good, R. L. (2009). L1 glosses: effects on EFL learners' reading comprehension and vocabulary retention. *Reading in a Foreign Language, 21*, 119-142.

Davis, J. N. (1989). Facilitating effects of marginal glosses on foreign language reading. *The Modern Language Reading, 73*, 41-52.

Egbert, J. (2005). CALL essentials: principles and practice in CALL classroom. *TESOL, 12*, 124-140.

Harmer, J. (2007). *How to teach English.* London: Pearson Education.

Jacobs, G. M., Dufon, P., & Fong, C. H. (1994). L1 and L2 glosses in reading passages: their effectiveness for increasing comprehension and vocabulary knowledge. *Journal of Research in Reading, 17*, 19-28.

Khalaji, H. R., & Vafaeeseresht, K. (2012). The impact of reading strategy training on the reading comprehension of Iranian EFL learners. *Journal of Language Teaching and Research, 3*, 135-140.

http://dx.doi.org/10.4304/jltr.3.1.135-140

Ko, M. H. (2005). Glosses, comprehension, and strategy use. *Reading in a Foreign Language, 17,* 125-143. Retrieved from http://nflrc.hawaii.edu/rfl/October2005/ko/ko.pdf

Lomicka, L. L. (1998). "To Gloss or not to gloss": An investigation of reading comprehension online. *Language Learning & Technology, 1,* 41-50. Retrieved from http://llt.msu.edu/vol1num2/pdf/article2.pdf

Marzban, A. (2011). Investigating the role of multimedia annotations in EFL reading comprehension. *Procedia Social & Behavioral Sciences, 28,* 72-77. http://dx.doi.org/10-1016/ 1877-0428.28.2011.72

Mayer, R. E. (1997). Multimedia learning: are we asking the right questions? *Educational Psychologist, 32,* 1-19.

Mayer, R., & Moreno, R. (1998). Information Processing and Multimedia Usability. *Journal of Educational Psychology, 91,* 358-368.

Nation, L. S. P. (2009). *Teaching ESL/ EFL reading and writing*. New York: Routledge.

Park, H., & Kim, D. (2011). Reading-strategy use by English as a second language learners in online reading tasks. *Computers & Education, 57*, 2156-2166. http://dx.doi.org/10.1016/0360-1315.2011.05.014

Rezaee, A. A., & Sharbafshoar, N. (2011). Investigating the effect of using multiple sensory modes of glossing vocabulary items in a reading text with multimedia annotations. *English Language Teaching, 4,* 25-34. http://dx.doi.org/10.5539/1916-4742.4.2.25

Rott, S., & Williams, J. (2003). Making form-meaning connections while reading: A qualitative analysis of word processing. *Reading in a Foreign Language, 15,* 45-75. Retrieved from http://nflrc.hawaii.edu/rfl/April2003/rott/rott.pdf

Sakar, A., & Ercetin, G. (2005). Effectiveness of hypermedia annotations for foreign language reading. *Journal of Computer Assisted Learning, 21,* 28-38.

Saslow, J., & Ascher, A. (2006). *Summit 1B*. London: White Plains, NY: Pearson Education.

Shalmani, H., B., & Sabet, M., K. (2010). Pictorial, textual, and picto-textual glosses in e- reading: a comparative study. *English Language Teaching, 4*, 195-203.

Shiki, O. (2008). Effects of glosses on incidental vocabulary learning: Which gloss-type works better, L1, L2, single choice, or multiple choices for Japanese university students? *Journal of Inquiry and Research, 3*, 39-56.

Tabatabaei, O., & Shams, N. (2011). The Effect of multimedia glosses on online computerized L2 text comprehension and vocabulary learning of Iranian EFL learners. *Journal of Language Teaching and Research, 2,* 714-725. http://dx.doi.org/10.4304/jltr.2.3.714-725

Taghavi, E., & Sadeghi, K. (2008). The effect of semantic mapping on reading comprehension. *The Journal of Applied Linguistics, 1,* 204-220.

Zandieh, Z., & Jafarigohar, M. (2012). The effects of hypertext gloss on comprehension and vocabulary retention under incidental and intentional learning conditions. *English Language Teaching, 5,* 60-71. http://dx.doi.org/10.5539/5.6.60