WCETR 2011

Investigating the role of multimedia annotations in EFL reading comprehension

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Abstract

The majority of studies in second language acquisition have focused exclusively on the learning of verbal materials rather than the combination of text and visuals such as graphs, diagrams, pictures, and video (Chun & Plass, 1996). Some researchers like Paivio (1990) proposed that using sound and video annotation with text annotation together facilitates the cognitive processes identified for successful second language reading comprehension (Paivio, 1971, 1986, 1990). The main objective of this study was to compare the effects of audio/video annotation used by 68 pre-intermediate level students who were randomly divided into multimedia- and paper-based conditions. Multiple-choice reading comprehension test was used to assess the learners' reading comprehension capability. Independent sample T-test showed statistical significance at P≤0.05 level. This study provides practical information for CALL reading comprehension materials designers in choosing the right combination of modalities in facilitating L2 reading comprehension. It also informed language teachers and administrators who need to make solid decisions about multimedia programs to enhance L2 reading comprehension.

Keywords: Multimedia Gloss/Annotation; English as aForeign language (EFL); ICT; CALL; Reding Comprehension

1. Introduction

In the realm of second language acquisition (SLA), the most recent effort to enhance the process of language learning has involved computer technology and ever since practitioners have agreed that this technology holds great potential for language learning, leading to what is known as Computer-Assisted Language Learning (CALL).

Recent years have seen increased interest in research on L2 reading comprehension within computer learning environment in which a learner can use the help of glosses. One important debate is on the effect of multimedia glosses on reading comprehension in comparison with traditional texts on paper. Gloss has been used as a standard feature in L2 reading materials to facilitate comprehension (Yao, 2006; Sakar, 2003). Some studies have examined the effects of different types of multimedia glosses on reading comprehension, in particular, the use of picture gloss and video gloss coupled with text gloss (Al-Seghayer, 2001; Chun & Plass, 1996). These studies support dual-coding theory (Paivio, 1971). Dual glosses of text and picture or text and video are discussed to be better than single glosses in facilitating reading comprehension (Al-Seghayer, 2001; Chun & Plass, 1997; Lomicka, 1998). On the other hand, research suggests that the addition of a multimedia element to dual glosses does not seem to have a definite effect on L2 reading comprehension (Chun & Plass, 1996). One possible explanation is that the information delivered simultaneously through different forms (audio, verbal and visual) might overload the cognitive processing. It is, therefore, necessary to further investigate the effects of glosses on text comprehension.

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2. A brief review of literature

2.1. Gloss

Roby (1999, p. 96) defines glosses as any "attempts to supply what is perceived to be deficient in a reader's procedural or declarative knowledge" and offers a comprehensive taxonomy of glosses that divides glosses based on six criteria: 1. Gloss writing that divides glosses into those generated by the learners or by instructors or material developers, 2. Gloss presentation that divides priming gloss and prompting gloss, 3. Gloss functions that include procedural functions (for example, metacognitive) and declarative ones (such as linguistic), 4. Gloss focus that emphasizes either textual or extra-textual information, 5. Gloss language in L1 or L2, and 6. Gloss modality of verbal, visual or audio forms.

2.2. Traditional Gloss

A vocabulary gloss is defined as a brief definition or synonym or an explanation of the meaning of an unfamiliar word (Salaberry, 2001). Arrows, brackets, underlining, bolding, or highlighting in the text are common ways to indicate these annotated words (Neo and Neo, 2001). Glosses seem to serve several purposes. First, they assist vocabulary learning (Sanders, 2002; Ko, 2005). Second, they enhance reading comprehension (Salaberry, 2001; Rott, Williams & Cameron, 2002; Ko, 2005). Third, they draw learner attention to the annotated words in both forms and meaning. Furthermore, L2 learners prefer vocabulary glosses compared to using a dictionary (Akbulut, 2006).

2.3. Multimedia Gloss

The investigation of gloss has been taken a step further with the advance of multimedia application in second language teaching and learning. Constantinescu (2007) predicted the advantages of multimedia glosses. He noted that because hypertext is invisible and thus "unobtrusive" in the reading process, yet the user is able to obtain as much or as little detail as is desired or required about a given concept. Salaberry (2001) confirmed that computerized gloss was an effective means in L2 reading comprehension and was preferred by L2 learners. By clicking the hyperlink, the learners can access various forms of gloss in a so-called pop-up window which does not cover the text section where the annotated word appears. It is done to avoid any interference with the reading process. Overall, there are four types of glosses: text gloss, picture gloss, audio gloss, and video gloss. A text gloss offers a textual definition or meaning of the unknown word. A picture gloss usually employs a static or stable picture to describe or "show" the meaning of the unknown word. 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. A video gloss employs a video clip to depict the meaning of the target word.

2.4. Research on the Effectiveness of Multimedia on L2 Reading Comprehension

Considering the works done on reading in relation to multimedia we can see different and inconclusive results. Roby (1999) who compared the use of dictionary and glosses on paper and computer observed no differences among the four experimental groups (i.e., paper dictionary, paper dictionary and glosses, computer dictionary, computer dictionary and glosses) in terms of reading comprehension.

In contrast, Lomicka (1998) found that participants in full glossing condition (i.e., L1 translations, L2 definitions and pronunciations, images, references and questions) have significantly higher scores in reading comprehension than participants in limited glossing (i.e., L1 translation and L2 definitions) and no glossing conditions.

In a similar study, the effect of verbal ability was also explored by Chun (2001) who conducted a study with L2 learners of German. These learners were exposed to two versions of an electronic text: The first text had an internal dictionary and an external dictionary (online), whereas the second text had only an external bilingual dictionary.

Ariew and Ercetin (2004) exposed 84 intermediate and advanced adult ESL learners to an electronic expository text, which included different types of glosses. It provided both lexical and topical information. Results indicated that gloss use did not correlate with reading comprehension for the advanced group. Moreover, there were negative correlations between reading comprehension and picture and video glosses, and of course no correlations between reading comprehension and other types of glosses for the intermediate group.

Sakar and Ercetin (2005) replicated this study with 44 intermediate EFL students and found that audio and video glosses correlated negatively with reading comprehension and no relationship was observed between reading comprehension and other types of glosses.

Sakar (2003) suggests that the effects of glosses may have relationship with learning styles. Learners of German were given a story that contained verbal glosses (translation of words) and visual glosses (picture or video representing the word). It was concluded that the participants recalled propositions better if they involved their preferred mode of gloss.

Ko (2005) investigated the effectiveness of the glosses on reading comprehension. One hundred and six Korean undergraduate students read an English text under three conditions: no gloss, L1 gloss, and L2 gloss. Qualitative analysis indicated that both types of glosses made reading comprehension better. On the other hand, quantitative analysis indicated that only L2 glosses affected students' reading comprehension. Moreover, 62% of learners favored L2 glosses for their reading material.

In a more recent study, Pin-fen Chen (2008) concluded that in terms of reading comprehension, students improved their reading comprehension scores and attitudes toward English learning as implementing animated picture books.

To sum up, easy access to glosses may reduce study time, but it is not clear whether they facilitate reading comprehension. The issue gets more complex when it is investigated in relation to individual difference variables such as proficiency level, verbal ability, and learning style.

3. Research methodology

3.1. Participants and Setting

The participants of this study were chosen from among the 80 pre-intermediate level EFL students from three institutes in Qaemshahr in the north of Iran which define proficiency levels by a placement test – Oxford Placement Test – at the beginning of semester and also validated by administrating the Nelson English Language Test (Fowler & Coe, 1976). In order for a student to qualify as pre-intermediate, he must get more than 60% in the test. The researcher found that 68 reached the criterion. Forty of the participants were female and 28 were male, aged from 13 to 18.

3.2. The Instruments

The following section describes the instrument including the reading text, the program, and the reading comprehension test.

3.2.1. Reading Texts
Two reading texts, "Animal Kingdom and Seaside Getaway" were chosen to be administered with multimedia, through Tell Me More, and without it, on paper. According to SMOG Readability Grade, in terms of length, Animal Kingdom had 256 words (including the title), 27 sentences, and 368 syllables; and Seaside Getaway had 413 words (including the title), 37 sentences, and 578 syllables. The educational levels were 8.96 and 8.84 respectively which are considered appropriate for pre-intermediate. The reading texts had two different forms of glosses: audio, and video. Videos were shown at the left side of the texts.

3.2.2. The Program
The multimedia program – Tell Me More – used in this study was designed to help EFL students in different levels with their reading comprehension. The program provided students with glosses for unknown words via hypermedia links in two different modes: audio, and video. The glosses were used to assist the learning of unknown

words and understanding of the reading text. The right section of the screen was used for reading the text and the left section was used for glossing. When participants clicked on an unknown word, they could see a small circle which then leads to the pronunciation of those words. On the left screen there was a video in line with the text. The students could watch the video when reading the paragraph and simultaneously listen to a native speaker reading the paragraph. Besides, the sounds of nature, animals, and any other things were provided by the program.

3.2.3. Multiple-choice Reading Comprehension Test

The reading comprehension test was comprised of 10 multiple-choice questions. The questions were confirmed to be easy to understand and reflective of main idea of the reading text by participants in the pilot study. The KR-21 reliability and Criterion-related (Nelson Test) validity of the test were found to be 0.70 and 0.81, respectively.

3.3. Procedure

The study was conducted in two 50-minute sessions. First, the participants signed the consent form, and then they were randomly assigned to the learning conditions: traditional paper text and dictionary, and multimedia text with glosses. The multimedia students went to the language lab equipped with computers and headsets. 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 without multimedia. Of course the exams were repeated in a counter balance way in two times, with two different tests having the same readability. Then the mean scores of both groups in each exam were calculated and compared two by two, to assure the results of the study.

4. Results

Table 1 shows the descriptive statistics for the participants who answer the questions in two different environments. It presents the means and the standard deviations of the Reading Comprehension Tests with Multimedia and without Multimedia using two different texts. As shown by Table 1, the mean score for Group A – with Multimedia – in "Animal Kingdom" (M = 7.0765) was higher than Group B (M = 5.4265). The mean score for Group A – without Multimedia – in "Seaside Getaway" (M = 5.3235) is lower than Group B.

Table 1. Descriptive statistics of the tests

The tests	n	Min.	Max.	Mean	SD
Nelson	80	%47	%100	73.5	9.65447
AM	34	1.6	10	7.0765	1.94314
BM	34	-0.3	10	5.4265	2.32148
AW	34	2.6	10	5.3235	1.94641
BW	34	1	10	7.1235	1.79596

AM: Group A with Multimedia   AW: Group A without Multimedia
BM: Group B with Multimedia   BW: Group B without Multimedia

As seen in Table 2, the Independent Sample T-Test results show that there is a meaningful distinction between the means of two groups at 0.05 level of significance.

Table 2. Statistics for Independent Sample T-test on two Group means

The tests	n	Mean differences	Sig.
Animal Kingdom	34	1.65	0.002
Seaside Getaway	34	1.8	0.000

P < 0.05

5. Discussion and Conclusion

This study supports the modality effect of the cognitive theory of multimedia learning. 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). According to the modality principle, audio and/or video glass simultaneously engages both the visual working memory and auditory working memory, while text gloss involves only the visual working memory. The results also show that knowing the unknown words which is possible by glosses, facilitate the reading comprehension ability. Glosses can help students avoid wrong guessing. Because as Rott et al (2002) noted in their article, gloss provide "context-specific meanings" for unknown words. Another strong point of using multimedia is that it will match to the level of users and their individual characteristics. Any learner can match his/her speed of reading passage or finding words with the program which is absent in paper dictionaries. Glosses also draw participants' attentions toward the target words. Despite the merits of using multimedia, previous research has shown that many obstacles can prevent teachers from using ICT, such as problems in infrastructures, lack of training, book-and teacher-centrism and weak technical support (Marzban, 2011).

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