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The Effect of Multimedia Instruction and Shadowing on EFL Learners' Reading Comprehension

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Abstract
This study investigated the effects of three methods of teaching, including multimedia, shadowing, and traditional method on Iranian English as a Foreign Language (EFL) learners' reading comprehension ability. Seventy Iranian EFL female learners, aged 15 to 17, who were studying at schools in Qazvin participated in this study. Based on the results of the Key English Test (KET), the participants were homogenized in terms of their English proficiency level. The participants were divided into three groups. Each group was randomly assigned to a different treatment condition. At the end of the treatment period, a reading comprehension test was administered. A one-way ANOVA was used to analyze the obtained data. The results indicated a significant difference between the multimedia and traditional groups in favor of multimedia instruction. However, there was no significant difference between the multimedia and shadowing groups, nor was there any significant difference between the shadowing and the traditional groups. The findings may have implications for learners, teachers, and syllabus designers.

***Keywords*:** Reading, Reading Comprehension, Multimedia, Shadowing

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1. Introduction

Reading is one of the most important language skills. According to Barnett (1989), reading is a primary means for language learning. Learners of a foreign language may rarely find chances to communicate with native speakers orally, but they can read different texts on different subjects, get a lot of information, and become familiar with new cultures. Grabe (1991)

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argues that reading is important because it can provide 'social and economic opportunities' for students (p. 386). Due to the importance of reading as a means for language learning and a source of information and input, the need for reading, teaching reading, comprehending texts, and getting the main idea of texts is very important for teachers and students.

According to Muaka, Bernhardt, Kamil, and Pang (2003), good teaching of reading helps students to learn to read and read to learn. They also believe that teachers should adapt their instruction with changing abilities of students. Today, in postmethod era, there is no single method that can be used in all language classes, and every teacher can select methods based on the situation and the students' level of proficiency and needs.

Nowadays, thanks to the developments in science and technology and the expansion of second and foreign language reading research, teaching reading and other language skills has changed. One of the most effective new tools for the teaching and learning of a language in today's world is computer. Hu and Deng (2007) argue that the emergence and popularity of Computer-Assisted Language Learning and Teaching (CALL & CALT) has made it possible for many teachers and instructors to shift their attention to student-centered instruction.

In terms of computer technology, the study has applied *Multimedia Instruction*. Multimedia Instruction (MI), because of its specific potentiality, has created many new possibilities for education. As Moreno and Valdez (2005) argue, multimedia environments have the potential of promoting meaningful learning by varying both the number of representations provided to students and the degree of student interactivity. The study is an attempt to investigate the effect of multimedia on Persian students' reading comprehension.

Another side of the study is *shadowing*, in which students, instead of reading texts independently, shadow their partner's speech. Shadowing is to repeat language after someone either silently or out loud (Murphey, 1995). Murphey introduces three varieties of shadowing: *lecture* shadowing, *reading* shadowing, and *conversational* shadowing. In lecture shadowing, listeners shadow silently in their heads what a speaker says, in conversational shadowing the listener repeats all of the speaker's words (complete shadowing) or selects some words and repeats those words (selective shadowing). In reading shadowing, one student reads a passage while a partner shadows (Murphey, 1995, p. 42).

Several studies (e.g., Commander & Guerrero, 2013; Deacon & Murphey, 2001; Murphey, 2001a; Murphey, 2001b; Nakanishi & Ueda, 2011; Shiki, 2010; Zakeri, 2014a ; Zakeri, 2014b) have focused on shadowing, and several studies (Gómez & Bangs, 2004; Chun & Plass, 1996; Hallet, 1999; Khamkhien, 2012; Moqbel & Rao, 2013; Nim Park & Son, 2009) have investigated the effect of computer and multimedia on learning and teaching language. However, few studies, if any, have compared the effect of shadowing and the use of multimedia on reading comprehension ability. It is the aim of the study to address this question.

2. Literature Review

2.1 Computer-Based Instruction (CBI) in Language Teaching

Computers entered the school life in the late 1950s in the developed countries, and the language laboratories, which were established in the 1970s under the influence of the Audio-lingual Method, gave room to CALL (Gündüz, 2005). Gómez and Bangs (2004) note that many universities, schools and companies rushed to use computer and its accompanying equipment, even without much knowledge about computer, nor about language teaching.

As Gómez and Bangs (2004) point out, it was not until late 90s that CALL researchers focused on more language methodology and less on computer skills. Nowadays, with the new technology and information, the role of computers in all subject areas, especially language teaching, is growing more and more all over the world. Computer and its equipment have many applications for teaching a second or foreign language, especially English as an international language.

The development of technology and teaching pedagogy has provided opportunities for integration of computers into the language learning process. As Hallett (1999) suggests, multimedia integrates a variety of media such as text, sound, voice, still and animated graphics as well as video. According to Moqbel and Rao (2013), multimedia is very useful in English language teaching because it provides more opportunities and exposure for EFL students to practice and learn English. Students engage in a creative and effective learning environment and their motivation increases. Chun and Plass (1996), highlighting the positive effect of presenting lexical items with different types of media, state that words that are coded dually in two modes are learned better than those coded only in one mode. Therefore, the use of different types of media (picture, sound, video, etc.) for lexical presentation may increase retention and help students to recall better. Based on the generative theory of multimedia learning, when students are presented with materials, they make connections between the information, and finally meaningful learning occurs when this connection is stored in the long-term memory.

A number of studies have investigated the effects of CBI and multimedia on reading comprehension and L2 learning. In one such study, a metaanalysis of the findings of 254 studies by Kulik and Kulik (1991) revealed that CBI usually had positive effect on students of all age levels, from kindergarten

pupils to adult students. Furthermore, it was found that CBI had positive effects on students' attitudes toward instruction. Investigating the effect of multimedia annotations on vocabulary acquisition and reading comprehension, Chun and Plass (1996) concluded that a visual advance organizer (e.g., a video) had a positive effect on overall reading comprehension, and that the annotations that consisted of both visual and verbal information were more effective than verbal information alone. The result of a study conducted by Mayer, Bove, Bryman, Mars, and Tapangco (1996) showed that the multimedia summary that combined both visual and verbal formats was more effective than verbal summary. Plass, Chun, Mayer, and Leutner (1998) explored the effects of students' individul differences and preferences on multimedia learning. When students selected both the verbal and visual annotations, they remembered word translations better. Lomicka (1998), investigating the effect of multimedia reading software on reading comprehension, concluded that the full glossing (definition in French, images, references, questions & translations in English) of computerized texts led to a deeper level of text comprehension.

The results of a study conducted by Sakar and Ercetin (2005) indicated that students preferred visual annotations significantly more than textual and audio annotations. Furthermore, a negative relationship was found between annotation use (especially pronunciations, audio recordings, and videos) and reading comprehension. Moreover, the result of a study by Akbulut (2007) showed that, regarding reading comprehension, there was no significant difference between the groups that were provided with the definition along with both types of visuals and the definition only group. Babaie Shalmani and Khalili Sabet (2010) examined the effects of pictorial, textual, and pictotextual glosses on L2 reading comprehension. The results of the study indicated that the pictotextual-gloss group outperformed the other groups,

and that the pictorial-gloss group outperformed the textual-gloss group. Tabatabaei and Shams (2011) investigated the effects of various multimedia glosses, namely text, picture, and text-picture on online computerized L2 text comprehension and vocabulary learning. The findings of their study indicated that all the multimedia gloss groups comprehended L2 texts significantly better than the control group. Zarei and Oshnouie Mahmoudzadeh (2013) focused on the effects of various multimedia glosses on L2 vocabulary learning and reading comprehension. The result of the study showed that differences between each of the three experimental groups (textual, pictorial, and textual-pictorial) and the control group in vocabulary production was statistically significant, but the differences among these three groups was not statistically meaningful. Regarding reading comprehension, the finding of their study indicated no significant differences among the groups.

2.2 Shadowing

According to Nakanishi and Ueda (2011), shadowing was initially used for training interpreters. Murphey (2001b) describes shadowing as "immediately repeating part or all of an interlocutor's words during a conversation" (p. 131). According to Murphey (2001a), shadowing can be done in many ways. He introduces three ways of doing shadowing:

Complete shadowing: This shadowing refers to shadowing everything the speaker says.

Selective shadowing: In this shadowing, listener selects only certain words and phrases to shadow.

Interactive shadowing: In this way of shadowing, the listener selects certain words, and also adds some comments and makes the conversation more natural. Therefore, the listener is engaged more in conversation.

According to Murphey (1995), shadowing is a simple work, easy to teach, and easy to do, and it makes it possible for native speakers to check

comprehension, offer inter-language forms, and present a high quality input to listeners.

In a study conducted by Murphey (1995), transcriptions of the recorded conversations between the groups showed that complete shadowing did not lead to comprehension; however, selective shadowing, especially when integrated with comments and questions that made it more interactive, led to more involvement and deeper levels of comprehension.

Deacon and Murphey (2001) investigated the effects of techniques such as story-telling, shadowing, and retelling on language learning. They concluded that these types of activities increased students' comprehension, negotiation of meaning, and feelings of community. Based on this study, beginners used complete shadowing, while intermediate and advanced students tended to shadow selectively. Nakanishi and Ueda (2011) examined the impact of shadowing on Extensive Reading (ER) and the impact of ER on students' reading comprehension. The ER-and-shadowing class showed more gains on posttest scores, suggesting that shadowing might enhance the effects of extensive reading. However, group differences were not statistically significant. Zakeri (2014a) highlighted the positive effect of shadowing and other activities by holding that the students believed that their success was due to the effective teaching techniques they had in the class and the usefulness of shadowing, recording and paraphrasing. Zakeri (2014b), in another study, concluded that shadowing was an effective technique in fostering the fluency of the participants in the experimental group.

Shiki's (2010) study included two experiments, which focused on the effect of shadowing on students' reading comprehension. In the first experiment, on average, the students could not improve their reading speed and reading comprehension scores. In the second experiment of his study, the

results were not statistically strong enough to support the impact of shadowing instruction on reading skills.

The brief review of the literature on multimedia instruction and shadowing shows that although several studies have investigated the effects of multimedia instruction or shadowing on the teaching of reading, there are few studies, if any, which compare these methods of teaching reading. This implies that there exists a gap in research on this controversial issue. This study is an attempt to fill part of this gap; it aims to compare the effects of three important ways; multimedia, shadowing and traditional method of teaching reading on EFL students' reading comprehension. More specifically, the present study is an attempt to answer the following research question:

> Which of the instructional techniques (multimedia-based instruction, shadowing, and the traditional method of teaching) is more effective on Iranian EFL students' reading comprehension?

3. Method

3.1 Participants

Initially, 70 female EFL students who were studying at schools in Qazvin were selected based on convenience sampling to participate in this experiment. Based on the results of the Key English Test (KET) of English Language Proficiency, the participants were homogenized. In addition, those who missed two or more class sessions were excluded from the study. Thus, the experiment was carried out with 60 participants. The age of the participants ranged from 15 to 17 years old, and their native language was Persian. The students' scores on the KET showed that their level of English proficiency was preintermediate. They had no previous experience of attending language institutes; they had studied English only at school.

3.2 Instruments and Materials

The following instruments and materials were used in the study:

1. **A Proficiency test:** There was a pretest to homogenize the participants. The participants were administered a KET test at the beginning of the experiment. KET is a standard test for determining the proficiency level of pre-intermediate and intermediate students.
2. **A reading comprehension test:** Another instrument, a teacher-made test of reading comprehension, was used as a posttest. It contained 20 multiple-choice items. The students answered the test items after reading a short story at the end of the experiment. The validity of the comprehension test was established by having four specialists in language teaching and testing to review the test, and there was a consensus among them concerning the content validity of the test. Using the KR-21 formula, the reliability of the test was estimated, and it turned out to be 0.82.
3. **Reading passages:** The selection of English reading passages was crucial to ensure the validity of the experiment. The story *Stone Soup* from Thompson and Simmons (2009) and a story titled *Fire on Mountains* from Meister and Nation (1980) in four chapters were adopted from http://aj3000.com/wp/free-graded-readers for the purpose of the study.
4. **The multimedia materials:** The materials were designed by using Microsoft office power point presentation program by integrating text, sound, and pictures in slides. The texts were divided into different parts. Each slide included a part of the text, pictures of new words and audio texts. The new or more important words were highlighted in the text in a different color. By clicking on each word, the related picture appeared, and by clicking on each picture, the pronunciation of the word was given, too. Some additional grammatical information such as the past tense of irregular verbs (fall ➢ fell) were provided at the bottom of the text in each slide.

3.3 Procedure

The procedure was followed to answer the research question. Initially, the participants with the above-mentioned characteristics were selected based on cluster sampling and availability. To ensure the relative homogeneity of the participants in terms of their language proficiency prior to the treatment, the KET test was administered. The mean and standard deviation of the participants' scores on the test were calculated, and those participants whose score fell more than one standard deviation away (both above & below) the mean score were excluded from all subsequent analyses. Then, the treatment was introduced, during which all the groups attended ten class sessions, each lasting for 60 minutes. The participants were in three groups; each group was randomly assigned to a different treatment condition. The treatments included multimedia instruction, shadowing, and the traditional method of teaching reading. The description of the treatment in each group is as follows:

Group one (Multimedia Instruction): There were 20 participants in this group. The teacher used the multimedia materials designed with the aforementioned features. For instruction, first the teacher introduced new words with their pictorial equivalents through power point presentation. By looking at the picture of each slide, which was shown on whiteboard, and listening to the audio via computer speakers, the students became familiar with the pronunciation of the words and their meaning. Then, the parts of the text were presented along with the audio text and the students looked at the whiteboard and listened to the text. Having presented parts of the text on slides, the teacher asked the students to guess the meaning of the words and the message of each part. After showing all parts of the text, the teacher again showed the slides one by one, clarified the meaning of the words and the text, and asked the students to read the whole text individually again. The teacher

walked around the class and students could ask the teacher the parts that they could not understand clearly.

Group two (Shadowing Method): This group included 20 participants. Ten pairs were formed to read and shadow each other, and a CD player was provided for each dyad to listen to the text. The text of each class session was divided in two approximately equal parts of three paragraphs, each to ensure that both partners read and shadowed the same number of words. After listening to the text through CD player, one student (reader) read the designated part of the text and the other repeated the most important words in the sentences. Repetition was done in two ways: selective and interactive. Selective repetition was done by only repeating the key words or phrases. Students were reminded that they could add comments to expand, confirm, or clarify ideas. This part of shadowing can be considered as interactive shadowing. Therefore, the reader really saw whether or not the shadower had understood her while she was reading. The shadower then produced oral summaries of each paragraph. After Part I, the partners changed their roles of reader and shadower, and worked on Part II. These shadowing tasks may be considered as the interactional phase of the study. The meaning of important words that were thought to be unknown were written on the whiteboard by the teacher.

Group three (Traditional Method): In this group, the participants were taught using the traditional method of teaching reading. First, the teacher read all the text, wrote the new words on the whiteboard, asked the students to guess the meaning of the words, and finally clarified their meaning. Then, the students read the text again individually and translated it into Persian. At the end of each session, the teacher asked the students to explain about the text in Persian. A copy of the text was available for each student to read.

At the end of the experimental period, all three groups took part in the reading comprehension posttest. The obtained data were then summarized and submitted to further statistical analysis.

4. Results and Discussion

4.1 Results

The research question sought to investigate the effects of three different methods of teaching reading (multimedia, shadowing and traditional) on Iranian EFL students' reading comprehension ability. A one-way ANOVA procedure was used to analyze the participants' scores on the reading comprehension posttest. Descriptive statistics, including the mean, standard deviation, etc. are summarized in Table 1. As it can be seen in Table 1, the Multimedia group has the highest mean, followed by the Shadowing group, and the Traditional group has the lowest mean.

Table 1
Descriptive Statistics for the ANOVA on Reading Comprehension

Group	N	Mean	Std. Deviation
Traditional	20	22.011	5.940
Multimedia	20	28.968	4.727
Shadowing	20	25.800	4.762

Figure 1 shows the differences among the three groups more conspicuously.

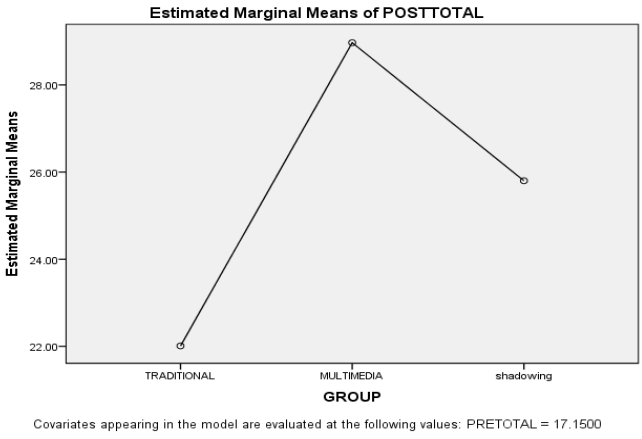

Figure 1. Mean scores of the three groups on the reading comprehension test

In order to see whether the differences among the means are statistically significant or not, the one-way ANOVA was run. The results of the ANOVA procedure are summarized in Table 2.

Table 2
ANOVA Result on Reading Comprehension

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	450.100	2	225.050	7.986	.001
Within Groups	1606.300	57	28.181		
Total	2056.400	59		$\omega^2 = 0.18$	

Based on Table 2, the F-value and the significance level ($F_{(2, 57)} = 7.98$, $p < 0.01$) indicate that there are statistically significant differences among the means of the three groups. It can be claimed, therefore, that different methods of teaching reading have differential effects on the students' reading comprehension. At the same time, the index of the strength of association ($\omega^2 = 0.18$) shows that 18% of the total variance in the dependent variable (Reading comprehension ability) is accounted for by the independent variable (method of teaching reading). This means that the remaining 82% of the variance is left unaccounted for. To locate the differences among the means of the three groups, a post hoc Tukey HSD test was used. The results of the post hoc comparisons are presented in Table 3.

Table 3

Multiple Comparisons of Means for the Students' Reading Comprehension

(I) GROUP	(J) GROUP	Mean Difference (I-J)	Std. Error	Sig.
Traditional	Multimedia	-6.700*	1.67	.001
	Shadowing	-3.650	1.67	.084
Multimedia	Shadowing	3.050	1.67	.173

*. The mean difference is significant at the 0.05 level.

A look at Table 3 makes it clear that there are significant differences between the Multimedia and Traditional groups in favor of the Multimedia group. However, there are no significant differences between Multimedia and Shadowing groups or between Shadowing and Traditional groups.

4.2 Discussion

One of the finding of the study was that multimedia and computer-based instruction had positive effect on L2 reading comprehension. This finding of the present study is consistent with several studies, such as Tabatabaei and Shams's study (2011), which showed that all the multimedia gloss groups comprehended L2 texts significantly better than the control group, and that using computer and multimedia can be effective on language teaching. Likewise, the result of the present study corroborates those of several studies (Babaie Shalmani & Khalili Sabet, 2010; Lomicka, 1998; Plass et al., 1998), which suggested that presenting words and texts through both visual and verbal channels may help students to explore the meanings of the keywords in reading passages easier, and arrive at an even deeper level of comprehension. Similarly, Mayer et al. (1996) found that the multimedia summary, which included both the visual and verbal format, was more effective than a verbal summary for comprehension of the scientific texts.

Moreover, the results support the generative theory of multimedia learning (Mayer, 1997). Dual-channel assumption is one of the basic principles of the generative theory of multimedia learning. Based on this

assumption, human beings possess two separate information-processing channels for the visual information (e.g., written text) and the auditory information (e.g., spoken text). When people are presented with a picture or animation, their visual channel begins to process information and when presented with a narration, for example, their auditory channel begins to process. Based on the generative theory of multimedia learning, meaningful learning occurs when students, as active processors, select and organize the relevant visual and verbal information, and systematically integrate the newly constructed visual and verbal representations by making one to one connections between features of the two representations.

Based on Dual-coding assumption, verbal and visual materials are processed and mentally represented in separate but interconnected systems (Brünken, Plass, & Leutner, 2003). In the multimedia group, the instructional materials were presented through two modes of presentation: verbal (text and audio) and visual (picture). The students had the opportunity to integrate the textual form of words and sentences with related pictures, or the spoken form of words and texts with related pictorial forms simultaneously.

The other reason for the better performance of the multimedia group compared with the traditional group, as Brünken et al. (2003) argue, could be that the use of picture-and-narration variant induces a lower amount of load in visual working memory. They point out that each of the auditory and visual information is processed in its respective system, and when a picture-and-narration variant is used, the total load induced is distributed between the visual and the auditory systems.

At the same time, the finding is different from a number of studies. According to Sakar and Ercetin (2005), annotations such as videos, audio recordings, and pronunciation affect reading comprehension negatively. Parts of the findings of Akbulut (2007), who worked on the immediate and delayed

effects of different hypermedia glosses on incidental vocabulary learning and reading comprehension, were to some extent similar to those of this study, and the other parts were different from those of the present study. The qualitative results of Akbulut's study (2007) suggested that hypermedia reading had positive impact on the participants' attitudes toward foreign language reading and vocabulary learning. However, regarding reading comprehension, no differences were observed among the three groups, which were provided with the definition of the words, definition plus the relevant pictures, and definition plus the relevant short videos.

Another finding was that there was no significant difference between the performance of the shadowing and traditional groups on the post-test of reading comprehension. This finding is in line with that of Nakanishi and Ueda (2011). Based on the result of their study, there was no statistically significant difference among the groups. Likewise, Shiki (2010) concluded that the effect of shadowing on reading comprehension was not statistically significant.

This finding also contradicts that of Deacon and Murphey (2001), who showed that activities such as shadowing increased students' comprehension, negotiation of meaning and feelings of community. In addition, the result of the present study is different from those of Murphey (1995), who found that *selective* shadowing, especially when it became more interactive, led to more involvement and deeper levels of comprehension. Furthermore, the results of the present study are in contrast to those of Murphey (2001a), who found that conversational shadowing may be effective on second language learning. Zakeri's work (2014a) is another study in this area. She concluded that activities such as shadowing had positive effects on students' success on international exams such as IELTS, TOEFL, and improved the students' proficiency level.

A number of factors could possibly account for the underachievement of the shadowing group in the present study. One of the factors may have been the novelty of this method, and the fact that the students needed more opportunity to accommodate themselves to shadowing instruction.

Another factor may have been the participants' native language. Including the native English speakers in such studies may have positive effects on learner's performance. Murphey (1995, 2001a) selected native English speakers and formed the shadowing dyads which included one native and one nonnative English speaker. However, all of the participants of the present study were Persian students of English. The other factor may have been the insufficient space that was considered for doing shadowing. In each dyad of the shadowing group, students listened to a text through a CD player, read the text and shadowed each other. This activity was somehow noisy, and needed a proper place and sufficient space, so that each dyad could shadow each other without any trouble. Another possible reason for such a finding may have been the time allocated to shadowing. At the beginning of each class session, the teacher had to form the dyads and divide the text into two approximately equal parts, to ensure that both partners read and shadowed the same number of words. Therefore, the shadowing group needed more time than the other groups. However, the allocated time for each session was 60 minutes for all three groups in the study.

5. Conclusion

Based on the findings of the study, it can be concluded that multimedia instruction facilitates reading comprehension. In addition, it may be concluded that providing a multimedia environment in language classes leads to better learning.

At the same time, given the findings and the mixed findings of the previous studies, it may be concluded that computer-based instruction can be

influential in language learning in general, and L2 reading comprehension in particular.

One of the critical factors that may affect the implementation of technology in language classrooms is educational decision makers. They should allocate sufficient time, budget, and tools to equip schools and language classes with computer and its accompanying equipment such as high quality speakers, video projection, and so on.

The other basic factor that may affect the implementation of technology in classrooms is teachers. The barriers such as lack of teachers' knowledge and experience with computer teaching, the lack of time required to successfully integrate technology into language classrooms, teachers' resistance to change the traditional methods of teaching, and teachers' lack of training in using equipment may also prevent teachers from using technology in their classrooms (Lidtke, 1981; Mumtaz, 2006; Sheingold & Hardely, 1990).

From the above discussion, it may be concluded that to overcome the inhibiting factors such as lack of teachers' knowledge and experience with computer teaching, educational policy makers can hold training sessions for teachers to improve their knowledge of computer use so that they become aware of the range of uses and possible benefits of technology.

The other teaching method used in the study was shadowing, which had good results compared with the traditional method of teaching, although its effect on students' reading comprehension was not statistically significant. Unlike the multimedia instruction and the traditional method of teaching in which students read texts independently, the shadowing method is a collaborative method. During shadowing, especially interactive shadowing, students shadow each other and can add comments and opinions about the texts, and even share their understanding. Therefore, it can be concluded that

whenever integrating technology into classrooms is not possible due to the factors such as cost, lack of time, and so on, teachers can teach through shadowing.

The findings may have implications for educational materials developers in that they may consider the importance of multimedia in language learning, and provide multimedia-based materials for language classes. The findings may also have significant implications for teachers. Instead of teaching reading in traditional methods and reading the text in a word by word or sentence-by-sentence fashion, teachers can draw upon multimedia materials and make the class more interesting. If teachers use multimedia in language classes, they will provide two modes of representation (verbal & visual), and can help students to learn more efficiently.

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