

The Effect of Electronic Dictionaries and Hypermedia Annotations on English Major Students' Reading Comprehension and Vocabulary Learning

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Abstract

This study explored the effect of using electronic dictionaries and hypermedia annotations on university students' receptive language skills, specifically reading comprehension and vocabulary acquisition. The subjects of the study consisted of 43 English major students who registered for the Reading One course at Taibah University in the second semester of the 2012-2013 academic year. The group was divided into two sections: section one was assigned as an experimental group, and section two was assigned as a control group. Data was collected over the course of twelve weeks via a pre/post test designed for an equivalent group. The results of the study indicated that students who were taught using electronic dictionaries and hypermedia annotation applications had better results than those who were taught using traditional methods. The researcher concluded that multimedia could facilitate students' learning of vocabulary and improve receptive language skills since they motivate and involve students in the teaching process. Accordingly, English departments at universities should accompany the main reading comprehension textbooks with instructions on how to utilize multimedia applications that render the teaching process more effective and successful.

Specifically, this study demonstrates the benefits of multimedia instructional technology on students' reading comprehension and vocabulary acquisition. The results suggest that teachers may want to consider the merits of multimedia as a means of enhancing students' reading comprehension.

Keywords: Multimedia, Electronic bilingual dictionaries, Glosses, Hypermedia annotations, Reading comprehension, Vocabulary acquisition

1. Introduction

In the recent decade, the use of modern technology in the field of teaching second language reading has been on the rise. A variety of studies have shown the importance of using computers in EFL (English as a foreign language) reading. Chun and Plass (1996) investigated how reading comprehension can be enhanced with a multimedia application for language learning. They studied the effects of an advanced dynamic visual organizer on the macro level and the effects of hypermedia annotations for single vocabulary items on the micro level. Furthermore, they investigated the relationship between vocabulary acquisition and reading comprehension. The results of their study indicated that the advanced visual organizer does aid in overall comprehension and that annotations consisting of both visual and verbal information help more than verbal annotations alone.

During the past ten years, the use of multimedia in FL (foreign language) classes has gained popularity as it contributes to students' experiential learning and language achievement. In several studies, multimedia applications have been found to enrich learners' linguistic skills by strengthening their overall language learning attitudes, self-instruction strategies, and self-confidence. More importantly, there is strong evidence that FL learners can improve their perceptions, attitudes, and motivations towards language acquisition by using multimedia applications (Taylor, 2006).

Multimedia applications have made computers a source of entertainment, communication, and learning. They can imitate a book, an audio CD player, a video game, a telephone, an editing studio, or even a drafting table. The integrated use of computers and online grammar tests can serve as an alternative to printed classroom materials for EFL learners (Lai, C.2006).

There are many merits to using computers as a tool for promoting language education. They are nonthreatening and allow students to actively advance at their own pace without being disturbed by time constraints and the impatience that is common in traditional learning environments (Hansen-Smith, E2001).

More importantly, using hypermedia annotations to enhance reading comprehension and vocabulary acquisition is highly beneficial because it can motivate EFL learners, stimulates their enthusiasm, enrich the educational environment, emphasize the individual's needs, and reduce stress and anxiety. Furthermore, gloss descriptions or definitions clarify abstract concepts that are difficult to express (Ko, 2005).

In addition, reading comprehension is the process of extracting, processing, and retaining significant information from printed or written material. To interact with and comprehend the text, students must understand the vocabulary that is being used. In addition to looking up words in a dictionary, vocabulary is acquired explicitly and implicitly through direct and indirect exposure to language as well as deliberate instruction regarding specific words and learning strategies. The variety of methods through which language can be absorbed calls for an investigation of the effects of multimedia applications on the students' retention and comprehension (Nikolova, 2002).

Furthermore, the difficulties experienced when learning English inevitably lead to new ways of enhancing students' learning and retention skills. Multimedia provides insight and information that helps students improve their ability to read and understand English. Researchers have examined the efficacy of this digital resource as a tool to enhance reading comprehension and vocabulary acquisition (Hulstijn, 1992; Hulstijn and Greidanus, 1992; Laufer and Shumueli, 1997; Watanabe, 1997). The question, therefore, has shifted from whether or not multimedia can teach vocabulary, to which kinds of multimedia are most effective at doing so.

Besides, it is obvious that the use of computers and the internet has changed the way we read and interact with texts. When we surf the internet, information appears as hypertext. This text presents information in nodes and links that integrate multiple forms of media. Reading becomes an exercise in extracting information from nodes and then "jumping" to other nodes via relevant links (Sakar, 2005).

The contemporary literature on language teaching and learning has shown that the role that vocabulary acquisition plays in second and foreign language learning has long been neglected. However, vocabulary is currently receiving increased attention in teaching curricula. This might be due to several reasons, such as the influence of comprehension-based approaches to language development. There is now a reciprocal, well-documented relationship between understanding vocabulary and reading comprehension. Some research has already assessed the general benefits of ESL/EFL software on reading comprehension and vocabulary acquisition (Freebody, 1981; Lyman-Hayer & Davis, 1996; Bell, 2000; Ali, & Haafar, 2010; Nation, 2001; Lubliner, 2005; Yoshii, 2006; Al-Qqaili, and Taha, 2007; Akycl, A. and Anderson, 2009; Behjat, 2011; Goudarzi, 2012; Hamouda, 2013). More recent studies have investigated the effect of an extended use of computers on reading achievement, the effect of computer instruction on reading rate and comprehension, the effects of multimedia on reading comprehension and vocabulary acquisition, as well as the relationship between learning vocabulary and reading comprehension (Lai, C. 2006). Most research on vocabulary acquisition and CALL (computer assisted language learning) has focused on the effects of hypermedia annotation, audio, video, and animation. The same is true for reading comprehension since vocabulary and reading are closely related.

Other research focused on technologically enhanced vocabulary development and highlighted the increased effectiveness of electronic dictionaries designed specifically for English language learners.

In light of what has been discussed, electronic dictionaries and hypermedia annotations can be regarded as valuable instructional tools to improve students' knowledge of a variety of lexical items in authentic contexts and provide friendly classroom experiences, giving students the opportunity to improve their reading and vocabulary skills.

2. Statement of the Problem

From the researcher's personal experience and observation made inside the classrooms,

students are sometimes shy and afraid to ask their teachers about the meaning of difficult words. When they are asked simple, direct questions regarding written material, students may find no difficulty in giving answers. However, when they are asked further questions that call on their reading comprehension skills, students may find it difficult to answer questions because they were unable to determine the meaning of certain words while reading the text. Therefore, the need arises to reduce students' anxiety by using applications such as hypermedia annotation and electronic dictionaries to enhance reading comprehension and vocabulary acquisition. Students can benefit greatly from having the freedom to access information and learn at any time of the day.

The meaning of a word may be found in multiple locations. When the student has to look outside the text to find that meaning, his/her attention is divided. Consequently, there is a need to examine the effect of multimedia on ESL learners' achievement in reading comprehension and vocabulary retention.

The researcher has noticed that vocabulary acquisition and retention is one of the major problems that FL students face and has attempted to explore the effect of using electronic dictionaries and hypermedia annotations as instructional tools on students' vocabulary and reading comprehension.

English language learners in KSA show a general weakness in language performance at university and scholastic levels. This might be attributed to a failure of the traditional methods of teaching to help students learn languages efficiently and effectively. Therefore, we should look for new ways and techniques to develop students' skills such as electronic dictionaries and hypermedia annotations. The researcher surveyed the opinions of 200 students and 30 teachers. About 95% of the teachers said that students struggle with reading comprehension and vocabulary acquisition. Additionally, they expressed a need for new techniques to help them teach the meaning of words.

The researcher hypothesizes that EFL students at all levels and stages are having difficulty acquiring the second language. Traditional teaching techniques are no longer sufficient to develop students' fluency and accuracy. This study examined the effect of using electronic dictionaries and hypermedia annotations on Saudi English major students' reading comprehension and vocabulary acquisition.

3. Significance of the Study

There may be many studies conducted on traditional environments and their effect on reading comprehension and vocabulary acquisition, especially at the scholastic level, but this study may be highly significant because it is an attempt to investigate the impact of multimedia applications, such as electronic bilingual dictionaries and hypermedia annotations, on EFL students' achievement. It may help EFL teachers incorporate electronic dictionaries and hypertext into their teaching practices and create a more effective learning environment. Additionally, this study may help curricula designers write textbooks rich in reading comprehension activities that integrate computer hypermedia annotations. In short, this study may demonstrate the importance of multimedia in educational practices and urge teachers and

curricula designers to develop more modern approaches that enhance their students' ability to comprehend and retain elements of language that were otherwise difficult to grasp.

4. Hypothesis of the Study

There are significant differences in the results seen in traditional methods and methods that integrate multimedia applications when teaching vocabulary and reading comprehension ($p = 0.05$).

5. Purpose of the Study

This study explored the effectiveness of multimedia applications such as hypermedia annotation and electronic bilingual dictionaries on ESL learners' outcomes in reading comprehension and vocabulary acquisition.

5.1 The question of the Study

Do electronic dictionaries, hypermedia annotations, and glosses have an effect on ESL students' reading comprehension and vocabulary acquisition?

6. Focus of the Study

1. Reading comprehension and vocabulary acquisition.
2. Hypermedia annotations and electronic dictionaries.
3. Saudi English major students who studied English at Taibah University during the first semester of the 2012-2013 academic year.
4. The material for teaching Reading One included texts found at the Department of Languages and Translation.
5. The term of the study is fixed to a period of three months.

7. Operational Definitions of Terms

1. Hypermedia annotation: A technique that may be used to help read a text by providing meanings for difficult words, thereby enhancing reading comprehension and vocabulary acquisition.
2. Reading comprehension: Reading comprehension is the degree to which we understand what we read, and it is defined as the process of extracting meaning from printed or written material.
3. Vocabulary acquisition: Deducing or otherwise acquiring the meaning of a word while reading a text.
4. Retention: The student's recollection of the meaning of a word after reading the text.
5. Traditional teaching material: Materials for learning vocabulary and reading comprehension without the aid of computers.

8. Literature Review

This section reviews studies, which are related to the use of electronic bilingual dictionaries and hypermedia annotations in teaching reading comprehension and vocabulary acquisition. They were listed from the earliest to the latest.

Anderson, and Freebody, (1981) claimed that familiarity is a significant variable in recognition, learning, and recollection. All foreign words are unfamiliar to the learner when they first see them. The more frequently a word is used, the faster it is learned. Higa also claims that the interaction among a group of words being learned at the same time is considered in terms of serial position, semantic relationship, amount of assimilation, and context.

Mondria, and Wit-de, (1991), pointed out that the goal of CALL is to facilitate learning. They believe that in traditional classrooms, the teacher is unable to spend an adequate amount of time planning, developing, grading, tracking and evaluating individual students' performance objectively. They believe that because a computer can collect and manage information at high speeds, it has the potential to motivate students to maintain composure and perform repetitive tasks without boredom.

Nagy (1989) investigated the effect of computers on vocabulary learning and reading comprehension, the result of his study revealed that learning achieved via computers, audio books, and multimedia facilities can positively influence students' vocabulary learning and reading comprehension.

Lyman-Hayer et al. (1993) investigated vocabulary acquisition and intermediate level students' glossing choices. The findings indicated that students who worked with the multimedia programs were better able to memorize vocabulary than students who worked with non-computerized text.

Jacobs, Dufon, and Hong (1994) examined learners' preferences and the effects of glossing on vocabulary acquisition and recall. The findings showed that glossing did not considerably affect memorization for the participants, but those with higher than average proficiency recalled more if they read a glossed version of the text. Those who had glosses outperformed their peers on a translation task administered immediately after they read a text. However, this difference was not recreated on the retest. Participants expressed preference for glosses, wishing that they were situated in the margin.

Lomicka (1998) studied the effect of multimedia reading software on reading comprehension. Specifically, the study aimed to investigate how hypermedia annotations impact the level of comprehension. The findings showed an increase in the number of causal inferences generated by students who had access to full glossing. Computerized reading with full glossing may promote a higher level of comprehension.

Nagata (1999) investigated the effectiveness of computer programs in teaching a list of unfamiliar words to 171 eleventh grade students. The experimental group was exposed to words by means of a program called "word attack". The findings of the study showed that

there were significant statistical differences between the scores of the experimental group and scores of the control group.

Nikolova (2002) examined the effects of student participation in creating a multimedia instructional module on vocabulary learning. The study showed evidence that students learn vocabulary considerably better when they participate. In addition, annotations containing text, sound, and pictures were found to be more helpful for vocabulary acquisition than annotations with sound and text only.

In a recent research study, Lubliner (2005) showed that using multimedia applications can improve the vocabulary development of English language learners. Children need to know a wide range of words to understand and learn from the stories they hear and read at school. An insufficient vocabulary is specifically problematic for English language learners who come to school with a limited English language background. Students who have a limited capacity to retain vocabulary are at risk of experiencing difficulties throughout their scholastic life.

Sakar (2005) investigated 44 adult intermediate level EFL learners' preferences for hypermedia annotations. Video and graphic annotations were accessed when students wanted to retrieve background information about the topic, and graphic annotations were used to explain the meanings of words. The outcomes showed that students preferred visual annotations to textual and audio annotations.

Akyel and Ercetin (2009) examined the approaches used by advanced English students while reading a hypermedia document in order to determine whether they are different from those reading strategies reported in the literature for printed texts. The findings indicated that transforming strategies are not used in hypermedia reading. Moreover, strategies used in utilizing annotations and navigating through the text were identified. Readers with high prior knowledge used certain cognitive and meta-cognitive strategies more frequently. Those without considerable prior knowledge were able to make up for it by navigating the text in a coherent manner and using annotations that provided background information about the topic.

Many other studies on vocabulary learning through multimedia applications showed that students learned vocabulary more effectively when they were involved incidentally or directly in an internet-based learning environment.

All of the studies above concluded that multimedia and computer-based instructional programs play a major role in enhancing language acquisition. The present study is similar to the reviewed studies in that it shares a common purpose: to explore the effect of multimedia on the acquisition of vocabulary and reading comprehension. However, the present study is considerably different from the previous studies because it focuses on learning the meanings of the words and reading comprehension via various multimedia simultaneously (electronic bilingual dictionaries, hypermedia annotations, and glossary).

It can be postulated that vocabulary and reading comprehension are inseparable and interwoven. As demonstrated by the case studies shown above, vocabulary plays a major role in reading comprehension and techniques that are useful for vocabulary development (such as electronic bilingual dictionaries, video and graphic annotations, and glosses) also benefit

reading comprehension.

9. Methodology and Procedure

9.1 The Sample of the Study

The participants of study consisted of two sections of English major students enrolled in the *Reading One* course at Taibah University in the 2012-2013 academic year. They were divided into two groups. The first group, section 1, was the experimental group that studied reading passages via multimedia (hypermedia annotations, glosses, and electronic bilingual dictionaries). The second group section 2 was the control group in which students studied the same course and texts using paper dictionaries.

9.2 Instrument of the Study

The researcher designed a test to measure the students' achievement in reading comprehension and vocabulary acquisition before and after start of the experiment. Questions were based on the *Reading One* textbook and course syllabus. The exam consisted of four units with two parts each, reading comprehension (10 questions) and vocabulary acquisition (10 questions). One point was allocated for each question for a total possible score of 80/80.

10. Validity of the Instrument

To determine the validity of the test, it was given to three TESL professors, five English language supervisors, and three language teachers instructing the *Reading One* course for an evaluation of accuracy, clarity, and the appropriateness. The test was adjusted according to their recommendations.

10.1 Reliability of the Instrument

The test-retest technique was used to determine its reliability. The test was given twice to 12 students who were not from the sample at a two-week interval. The Reliability Coefficient of the test was calculated to be 0.91 for reading comprehension and 0.89 for vocabulary (total = 0.90), a statistically acceptable value for the purposes of the study.

12. The Variables of the Study

This study contains the following variables:

1. Independent variables:
 - a) Teaching reading and vocabulary traditionally
 - b) Teaching reading and vocabulary via hypermedia annotations, glosses, and electronic dictionaries.
2. Dependent variable: Students' scores reading comprehension and vocabulary acquisition in.

13. Instructional Material

Four texts from the *Reading One* textbook were used in this study. Participants in experimental and control groups received the same material in two different ways. The referees who evaluated the test were asked to choose the most unfamiliar words from the texts. These words were annotated and distinguished using a different color than the rest of the text.

14. Instructional Treatment

The experimental group studied reading and vocabulary in groups using electronic dictionaries, hypermedia annotations, and glosses. A lab was provided with twenty-two bilingual electronic dictionaries. Each student in the experimental group had a computer and time to study the text with the researcher in a comfortable atmosphere. The program (hypermedia and glosses) was easy to use; the student was given access to the meaning of a word by clicking on it. The control group studied reading and vocabulary with the same teacher, but they were taught in the traditional way using paper dictionaries and deriving the meanings of words from context.

15. Study Procedures

This study was carried out during the second semesters of the academic year 2012-2013.

1. A pre-test was administrated to make sure that there was no considerable difference in the initial performance of the experimental and control groups.
2. The researcher explained the nature of the study and how to use the software.
3. The computer program was used two periods a day, five days a week, over the course of twelve weeks.
4. A post-test was administrated to the experimental and control groups.
5. All the collected data was examined using the related statistical analysis.

16. Findings

The findings of this study indicated that using multimedia applications has a positive effect on students' ability to learn vocabulary and reading comprehension. A text can be made more comprehensible by annotating it with multiple types of media glosses (Sakar and Ercetin, 2004).

Computers can create more proficient readers by offering the choice of various types of glosses to develop better vocabularies, greater background knowledge surrounding the text, and more effective reading strategies (Lyman-Hayer and Davies, 1996: 775). Various studies argued that multimedia applications are beneficial for reading comprehension and, consequently, for L2/SL vocabulary learning.

There was no statistically significant difference between the pre-test mean scores of the two groups as shown in Table 1.

Table 1. Means and Standard Deviation of the Control and Experimental Groups on the Pre-Test

Groups	N	Mean	Sd. Deviation	d.f	T value	Sig.
Experiment	22	51.67	11.65	32	0.471	0.649
Control	21	51.33	9.43			

It was also shows that there were no statistically considerable differences at the $\alpha=0.05$ level, indicating that the two groups were similarly proficient in reading comprehension and vocabulary acquisition before the experiment.

Findings of the study

The study asked: "Do electronic dictionaries, hypermedia annotations, and glosses have an effect on ESL students' reading comprehension and vocabulary acquisition?" To answer this question, the means and the standard deviation of the two groups were calculated.

Table 2. Means and Standard Deviation of the Control and Experimental Groups on the Post-Test

Group	N	Mean	Sd. Deviation	d.f	T value	Sig.
Experimental	22	78.43	13.44	32	3.234	0.000
Control	21	52.13	17.09			

Table 2 illustrates that the mean scores of the experimental group in reading comprehension and vocabulary acquisition were higher than that of the control group. There are statistically significant differences between the experimental group and the control group in favor of the experimental group, suggesting that the electronic bilingual dictionary, hypermedia annotations, and glosses were found to be more functional for teaching reading comprehension and vocabulary acquisition than paper dictionaries alone.

17. Discussion of the results

This study investigated if there are any considerable differences between the experimental and control groups' results due to educational method (electronic bilingual dictionaries, hypermedia annotations, and glosses vs. paper bilingual dictionaries) on the reading comprehension and vocabulary acquisition. Results indicated that there was a significant difference between the achievement of the experimental and control groups, in favor of the experimental group. The means were 52.3 for the control group, and 78.43 for the experimental group. These differences in the students' reading comprehension and vocabulary acquisition scores were attributed to the method of instruction used in the study.

Using electronic dictionaries and hypermedia annotation gives students more opportunities to practice reading and to acquire a greater understanding of the vocabulary used. In addition, computers provide practice for students by offering a real language experience. Lai (2006)

supports these findings and reported that using electronic dictionaries and hypermedia annotations to enhance reading comprehension and vocabulary acquisition maybe highly beneficial because it motivates EFL students, stimulates their enthusiasm, enriches the educational environment, emphasize the individual's needs, and reduces the stresses and anxieties associated with learning a foreign language by making vocabulary and abstract concepts more accessible and easier to understand.

These findings are also in agreement with AL Madi (2002) who concluded that using a computer has a positive effect on the experimental group's vocabulary development. Ali and Jaafar (2010) found that students generally perform better when using a computer-based system for reading comprehension tests. Taylor (2006) indicated that students given L1 computer glosses comprehended considerably more text than learners with traditional, paper-based L1 glossing aids. Sakar (2005) explored the effect of specific types of annotations on reading comprehension. The results of his study also indicated that the participants had a positive reaction towards annotations and hypermedia reading in general.

18. Conclusion

There is a reciprocal a harmonious relationship between vocabulary acquisition and reading comprehension. The greater the students' vocabulary, the better they perform in reading comprehension. Additionally, the more the students read using the appropriate strategies, the more their vocabulary grows.

19. Recommendations

Instructors should pay more attention to contemporary strategies and techniques that support and enhance vocabulary growth.

The Ministry of education should promote and accelerate the adoption of computers in its curricula.

Foreign languages teachers and instructors should be trained on how to teach reading comprehension and vocabulary acquisition by using hypermedia annotations and glosses.

Further studies should be done on reading comprehension and vocabulary learning.

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Autobiography

Ahmad M. Bataineh is an associate professor of applied linguistics. He worked at the Ministry of Education from 1999-2002 and is a member of the National Team of Curricula. He worked as a member of the committee for promoting teachers at the Ministry of Education in Jordan. He evaluated more than 80 English language books taught at Jordanian private schools and prepared reports for the Council of Education addressing the approval or disapproval of their use in classrooms. He was a member of the Jordanian National Team for preparing a new English curricula and textbooks for grades 1-12. He participated in editing and revising English textbooks taught in Jordan. He has a number of research papers on English language, literature, and curricula development methodology. He worked on the preparation of an English learning plan and its adaptation by the Institute of English language in Oregon, USA to Americanize teaching English in Jordan. He gave seminars on foreign language teaching, testing, and the integration of language and culture at various local and international universities. He gave seminars on machine translation, Muslim-Christian dialogues, human rights, and peace. He teaches MA and PhD courses at his university as well as at Amman Arab University and has supervised numerous PhD students. He worked as the head of the Quality Assurance Department and as the head of the Conferences Department at AL-al Bayt University. He has extensive experience in curricula design, teaching English as a global and foreign language, methodology, conferences, quality assurance, Muslim-Christian dialogues, human rights, and peace. He is committed to promoting the development of foreign language classes because he strongly believes that language is integral to personal, cultural, and international growth. Dr. Bataineh believes in teaching language within its cultural context, because language is the body that carries a culture's soul.