The Comparative Effects of Using Electronic Short Story Books and Traditional Printed Texts on EFL Learners' Reading Comprehension

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Abstract
The purpose of this study was to investigate the comparative effect of using electronic short story books and traditional printed texts on EFL learners' reading comprehension. For that purpose, ninety female learners ranging in age between fifteen and thirty five sat for the language proficiency test (PET, 2009) as the test of homogeneity and consequently sixty students were selected based on their obtained scores in the test and were randomly assigned into two groups to receive two kinds of instructional procedures including electronic and traditional short story readings. One group was required to read four electronic short story books and the other group read the same short stories in the printed version. For the purpose of the study, the researchers used twenty four open-ended comprehension questions which were answered by the students in the two groups in order to measure their reading comprehension of all four short story books. After that, a two-tailed test of significance (t-test) was run between the obtained means of the two groups on the open-ended comprehension questions to determine whether there is any significant difference between the performances of the two groups. The result revealed that there was a significant difference between the two groups with the electronic group outperforming the non-electronic one.

Keywords: reading comprehension, electronic books, multimedia, short stories

Introduction

The development of four skills, namely, listening, speaking, reading, and writing has long been the main challenge for the researchers and educators and they have always been concerned with developing methods and techniques to facilitate the teaching of them.   It seems that among so many questions, problems and discussions posed regarding these various language skills, many of them have aimed at the acquisition and development of the reading comprehension skill in ESL/EFL situations (Alderson, 2000). Furthermore, great mass of literature about the usefulness of reading comprehension has been published and that is an evident proof for the importance of teaching this skill (Carrel, 1998).

Regarding the importance of reading in learning a second or foreign language, it seems that new techniques can be introduced and practiced for expediting its learning. With the advent of pervasive technologies, learners' high computer literacy and keen interest in multimedia have inspired language teachers to consider the possibility of transforming their traditional teaching towards e-setting which students are constantly exposed to (Chu, 1995).

Computer technology as an intervention strategy helps teachers to change the negative perceptions of the learners towards reading comprehension as one of the skills in a foreign or second language (Adam & Wild, 1997), and the appearance of the text in multimedia-equipped material may provide that change.

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Many features of multimedia including oral reading, highlighting, animation and music/sound effects override printed texts (Adam & Wild, 1997). Specifically, it is advocated that the reading input be accompanied with audio-visual elements since the combination of both of them helps the students to distance themselves from tedious classroom lectures and encourages them to be willing in learning different types of knowledge (Underwood & Underwood, 1998).

To develop literacy skills and strategies, reading comprehension of the learners as one of the main skills can be improved through audio books instead of reading traditional texts. Research has demonstrated that listening to audio books improves accuracy, expands vocabulary, and develops comprehension (Medwell, 1996). In Medwell's study, there were two groups. The experimental group was required to read the story book in CD-Rom format and the control group was required to read it in printed version. The percentage of words that were read accurately was calculated. The group that had electronic intervention demonstrated a greater rate of accuracy. Most of the studies mentioned above were based on the criterion of fostering communication and the use of multimedia was the medium for reaching such a purpose.

Research on using electronic books

There have been numerous studies during the recent years with the purpose of scrutinizing different aspects of using multimedia. One of the examples can be found in Greenlee-Moore and Smith's (1996) study. They found that for their sample of 319 students, when the narrative was long and difficult (as defined by readability using the Fry Readability graph), comprehension scores were higher in the electronic condition. The results were explained in terms of the benefits of instant pronunciation and definition of difficult words in the electronic condition. Although learners in the printed condition could have received the same vocabulary help from their teacher, no student made use of this facility. The authors suggest that one benefit of the electronic condition is the privacy of 'failure'; the request for help is private. Further, the researchers videotaped the students' responses. The results manifested that both groups had enthusiasm in reading the books and answering the comprehension questions; however, CD-ROM group had more eagerness to perform the task.

In another study, Lefever-Davis and Pearman (2005) evaluated the effect of using CD-ROM story books on the reading comprehension of the learners who had restricted exposure to these CD-ROM story books. The researchers identified six types of behaviors in the use of electronic books. They were electronic feature dependency, tracking, distractibility, electronic features as tools, and spectator stance. In this research, they identified both the advantages and disadvantages of using electronic texts. One of the advantages of using such medium was the appealing atmosphere for attracting students' attention towards reading. Besides, the researchers concluded that CD-ROM storybooks would develop five necessary components of reading comprehension which were met by the use of CD-ROM story books. They included vocabulary, fluency, phonics, phonemic awareness, and comprehension. Audio pronunciation of texts, embedded vocabulary definition, and animated graphs are the supportive components of reading comprehension. The authors concluded that the use of CD-ROM story books for teaching the essential elements in teaching is a useful way for incorporating technology in the context of teaching. Also the early attempts of the learners in understanding the meaning of unknown words can be supported through the application of multimedia (Lefever-Davis & Pearman, 2005).

Therefore, EFL learners need to improve their reading comprehension, and the supposed advantages of using electronic short story books are deemed to be a practical way for comprehension improvement. Accordingly the researchers tried to make a comparison between the effects of using electronic short story books and traditional printed texts on the reading comprehension of EFL learners in order to make sure whether the application of multimedia would be beneficial in improving the reading comprehension of intermediate EFL learners. The following question was proposed for the purpose of the present study:

Is there any significant difference in using electronic short story books and traditional printed texts on EFL learners' reading comprehension?

Method

For answering the proposed question, the procedures for subject selection, instrumentation, and conducting the study are explained.

Participants

A total of 60 female Iranian students studying at Kish language school and varying by age participated in this study. The participants' age range was between 15 and 35. They were divided into two homogeneous groups after administering the proficiency test.

Instruments

In this study, the researchers used the following instruments.

A. Proficiency Elementary Test (PET) was used in order to homogenize the participants.
B. Electronic short story books and printed texts were each followed by open-ended comprehension questions.

Proficiency Test (PET)

The proficiency test of PET (2009) was used to screen participants at the level of B1. The test included three sections of reading (five parts), writing (three parts) and listening (four parts). As a whole this test had 67 items. The reading section of this language proficiency test had 35 items including 5 three-option multiple choice items, 5 matching, 10 true/false and 15 four-option multiple choice items, and for the writing section there were three parts including five sentence transformation items in the first part and in the other two parts students were required to write one essay for each episode. In other words in the second part students were required to write a short communicative message about 35-45 words, and for the third part they were required to write a longer piece of continuous paragraph about 100 words. In the listening section, students were required to answer 13 three-option multiple choice, 6 filling-the-gap, and 6 true/false items. It is worthy to mention that each section valued 25 marks. The reliability of the test was calculated through KR-21 formula and it turned out to be 0.78.

Electronic short stories and traditional printed texts

Four short stories were selected from Penguin Active Reading Series (2009) based on each, six open-ended questions were written. The stories were as follows: The Happy Prince, the Fisherman and his Soul, the Nightingale and the Rose, and the Star Child written by Oscar Wilde and retold by Sue Harmes (2009)., Each story contained approximately ten pages and the genre of

all four short stories in this study was classic. The criteria for the selection of the stories were their readability grades and their themes. During the years of teaching in different language schools, the researchers observed the tendency of the female students towards classic and dramatic stories. Therefore, the researchers decided to choose the short stories according to the interest of female students. All stories were simple narrations which did not require intensive focus of the learners for understanding the main theme.

Open-ended questions

24 open-ended questions were used as indices of the students' reading comprehension of the stories. Pearson and Johnson's taxonomy (1978) was used to create three kinds of questions: textually explicit questions, which require factual recall of information with the answers located directly in the text; textually implicit questions, or questions in which the answers are located in the text but may be in several locations and require processing or inference to assemble the answer, and scriptually implicit questions or questions which require the use of prior knowledge as well as information in the text to answer.

According to Pearson and Johnson's taxonomy (1978), two textually explicit, two textually implicit questions and two scriptually implicit questions were created for each story book title. Based on the four short stories 24 open-ended questions were created by the researchers.

Answers to the open-ended question were scored based on Baumeister's three-point scale. Two points were given for correct responses, one point for partially correct responses, and zero points for an incorrect or missing response (Baumeister, 1992).Possible scores for each short story ranged from 0, the lowest score, to 12 points, the highest score. Each test was initially corrected by the researchers. A colleague familiar with the procedure then rescored the tests.

Procedure

In the pilot phase of the study, four short stories followed by six open-ended questions for each short story were administered for a group of 30 intermediate female subjects at Kish language school. The total score for each short story was 12 and the allotted time to read each short story and answer the following six questions was 20 minutes.

After the selection of sixty participants, the

treatment started. Students in the first group (electronic group) were taught how to use electronic books by showing where to click the mouse to start and how to get the audio support. In the first week of the experiment, before starting the usual class session, the first experimental group (electronic group) was taken to the language laboratory and was asked to sit at the computers and read the first story and then answer the following six open-ended comprehension questions. At the same time the students in the other group (non electronic group) were reading the same short story in the print format. Since the printed versions of the short stories did not need any supportive means such as computers, all the 30 members of the non electronic group read the first short story and answered the six comprehension

questions that followed each story in twenty minutes.

For the second, the third, and the fourth short stories, the same procedure was taken in the second, the third, and the fourth weeks of instruction. Therefore, at the end of the study, four short stories which totally included 24 questions were covered by the members of the electronic and non electronic groups.

After covering the stories in both groups, the answers to the open-ended questions which were gathered after the administration of each story during the four weeks, were put together to make the total scores of the students.

Results

The descriptive statistics including 60 students is provided below.

Table 1
Descriptive data on PET

	Grouping	N	Mean	SD	Std. Error Mean
PET	Electronic	30	55.36	5.78	1.05
	Non- electronic	30	56.43	5.15	0.94

As Table 1 shows, the mean of total scores of subjects in the first group (electronic group) was 55.36 (M=55.36) and the mean of the total scores in the other group (non-electronic group) was 56.43 (M=56.43). A value of 0.78 was obtained for the KR-21 formula, showing that the test was

fairly reliable.

After the administration of PET, the researchers conducted an independent samples *t*-test and the test of normal distribution indicated that the two groups were normally distributed. The following descriptive statistics were used for that purpose.

Table 2
Normality of scores distribution in PET

Grouping	skewness		Ratio
	statistic	Std. Error	
electronic	0.05	0.42	0.12
non-electronic	0.00	0.42	0.12

Based on Table 2, the result of dividing the statistic by its standard deviation (skewness) for the electronic group indicated that the scores were normally distributed (.05 /.42= .12), since it falls within the normality range of -1.96 and +1.96. The distribution normality of the non-

electronic group's scores is likewise assured (.00/.42= .02), as the result of the division falls within the range too. The following tables display the descriptive data of the groups and the results of the conducted sample *t*-test procedure.

Table 3
Descriptive data on PET

	grouping	N	Mean	Std. Deviation	Std.Error Mean
PET	electronic	30	55.36	5.78	1.05
test	non-electronic	30	56.43	5.15	.94

Table 4

Independent t-test between the means of two groups

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig.(2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
PET	Equal variances assumed	.21	.64	-.75	58	.45	-1.06	1.41	-3.89	1.76
	Equal variances not assumed			-.75	57.26	.45	-1.06	1.41	-3.89	1.76

Since the variances are homogeneous (F=.21, p=.64> .05), the t-test can safely be used as an estimation for the significant difference between the means.

As the Table 3 shows, the mean of total scores of subjects in the first group (electronic group) was 55.36 (M=55.36) and the mean of the total scores in the other group (non-electronic group) was 56.43 (M=56.43). Based on Table 4, according to the value of the *t*-observed (t= -.75) at 58 degrees of freedom, the researchers concluded that there is no significant difference between the means of the two groups (t= -.75, p= .45> .05). Therefore, at 0.05 level of significance the hypothesis that there is no significant difference between the total scores of the two groups in their language proficiency test cannot be rejected and it illustrates that there is no significant difference between these two randomly divided groups; and that they are actually homogeneous.

According to the value of the *t*-observed (t= -0.75, df= 58), the researchers concluded that there is no significant difference between general proficiency means of the two groups (t= -0.75, p= 0.45>0 .05). Therefore, at 0.05 level of significance the hypothesis that there is no significant difference between the total scores of the two groups in their language proficiency test cannot be rejected and it illustrates that there is no significant difference between these two randomly divided groups; and that they are actually homogeneous.

In the next step, after the administration of the pilot test, its inter-rater reliability through Pearson correlation and its reliability through KR-21 formula, mean, and the standard deviation of the total scores were calculated by the researchers. One of the researchers and a second rater who was familiar with classification of the questions according to Pearson and Johnson's taxonomy and the scoring procedure, scored the questions of the 30 students. In order to calculate the inter-rater reliability between the raters, the correlation coefficient was to be checked through Pearson correlation. As an assumption for calculating correlation, the normality of the distribution of the two sets of scores by the two raters was checked. The descriptive statistics thereof is provided below.

Table 5

Descriptive statistics for normality of the distribution of two sets of scores by two raters

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
first	30	6.50	10.75	8.76	1.07	-.04	.42
second	30	6.50	11.00	8.61	1.18	.13	.42
Valid N(listwise)	30						

The result of the divisions of statistics by Std. Errors shows the normality of the distribution of both sets of scores given by the two raters (-0.09 and 0.31 respectively). Then the researchers were confident to calculate Pearson correlation coefficient. The calculation result of the Pearson Correlation Coefficient calculation is illustrated in the following table.

Table 6
Pearson correlation

		First	Second
First	Pearson Correlation	1	.93**
	Sig. (2-tailed)		.00
	N	30	30
Second	Pearson Correlation	.93**	1
	Sig. (2-tailed)	.00	
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

As demonstrated in Table 6, the r value is +.93 and the significance value is .00. According to the table, the correlation is significant at the 0.01 level. Therefore, the correlation between the two raters is highly positive and the researchers felt safe to run the tests on both groups. In addition to checking the inter-rater reliability of the test scores, the researchers calculated the reliability of the test through KR-21 formula. The following tables show the descriptive statistics and the reliability of the test in the pilot phase.

Table 7
Descriptive Statistics of the post test in the pilot phase

	N	Mean	Std.Deviation	Variance
Scores Valid N	30	7.91	4.72	22.32

Table 8
Reliability of the test in the pilot phase

Reliability of the Test (KR-2formula)	N of Items
0.97	24

As Table 7 displays, the mean of the scores in the pilot phase of the study was 7.91, the standard deviation of the total scores was 4.72. The obtained reliability was 0.97 which was a very high reliability index.

For testing the hypothesis of the research, the researchers conducted a *t*-test on the mean scores obtained by the two groups to demonstrate any possible significant difference in their performances. But prior to that, normality of the distribution of scores and homogeneity of variances had to be checked as conditions for a *t*-test. The following descriptive statistics were used for that purpose.

Table 9
Normality of distribution of scores in short stories

grouping	Skewness		Ratio
	statistic	Std. Error	
electronic	-0.04	0.43	-0.09
non-electronic	0.15	0.43	0.34

On the basis of the above table, the distributions of the scores obtained by both groups were normal as the ratio of skewness (statistic over Std. error) of both of them fell within the range of -1.96 and +1.96. (.04/.43=.09 and .15/.43=.34).

Table 10
Descriptive Statistics of the post test results

	Grouping	N	Mean	Std. Deviation	Std.Error Mean
reading comprehension of stories	electronic	30	8.75	1.08	.19
	non-electronic	30	6.67	.92	.16

Table 11
Independent t-test between the means of the two groups in the short stories

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig.(2-tailed)	Mean Difference	Std.Error Difference	Lower	Upper
reading comprehension of stories	Equal variances assumed	.20	.65	8.00	58	.00	2.08	.26	1.56	2.60
	Equal variances not assumed			8.00	56.63	.00	2.08	.26	1.56	2.60

Based on Table 11, the Levene's test indicated that there existed equal variances among groups (F= .2, p= .65 > .05). Hence, an independent sample *t*-test was performed comparing the means of reading comprehension scores for the two groups. The result of the independent sample *t*-test shows that there was a significant difference between the means of the two groups (t=8.00, p=.00 < .05). Thus, by virtue of the means that the two groups obtained, it is evident that the electronic group outperformed the non-electronic group. In other words, the mean score of the electronic group is significantly larger than that of the non-electronic group (8.75> 6.67). Therefore, It can be concluded that at 0.05 level of significance, the presupposed null hypothesis can be rejected which implies that the difference between sample means was large enough to be attributed to the different instructional methods provided by the researchers. In other words there was a significant difference between the two groups' mean scores of reading comprehension.

Conclusion

The results of the mean score difference in two groups revealed that there is significant difference between the performance of the students in electronic and non-electronic groups. Therefore, the null hypothesis of the study which stated that there is no significant difference in the effects of using electronic short story books and traditional printed short stories on EFL learners' reading comprehension is rejected.

A Previous research done by Greenlee-Moor and Smith (1996) demonstrated that students reading material that is considered above their reading ability perform better in hypertext situations than in print, and that students of below grade reading ability perform better on CD-ROM than in print (Greenlee-Moor & Smith, 1996; Rao, 2003).This last point is confirmed by the present study. As far as the electronic short stories were offered to the students in CD-ROM format and that the students were lower intermediate learners of English, the probability of their improvement in reading comprehension was anticipated by the researchers from the beginning of the study. This suggests that hypertext medium may be particularly suitable for presenting information that is difficult to understand for a particular audience and that is above the reader ability of the learner. On the other hand, the presentation of comprehensible and easy texts through CD-ROM would be beneficial for the learners of low reading ability performance.

A significant amount of literature explored the potentials, the benefits, and the disadvantages of multimedia, the Internet, and various forms of e-learning (Armstrong &Yetter-Vassot, 1994; Garrett, 1991; Ruschoff, 1993; Sussex, 1991). In some studies, hypermedia technology is considered as a tool for improving vocabulary (Liu, 1994) and comprehension due to its interactive potentials (Hult, Kalaja, Lassila, & Lehtisalo, 1990). Chun and Plass (1997) evaluated the benefits of using video and audio to support text comprehension. Kramsch and Andersen (1999) stated that multimedia technology could provide authentic cultural contexts that are crucial for language learning. Textual and visual annotations are provided by hypermedia-annotated reading lessons. Lessons that contain suitable reading and writing activities, together with supporting information, can teach readers to cope more easily with the difficulties that they usually face when they try to decipher a foreign language text (Martinez-Lage, 1997).

In return, this may encourage inexperienced readers to move away from an exclusive bottom-up reading process and toward an interactive approach that combines top-down processing (understanding of schema, propositions) and bottom-up processing (recognizing or understanding individual vocabulary words). In other words, the learners would be able to construct a comprehensive picture of the main idea of the test through the ancillary help of the photos and the animations provided in the program and on the other hand they are able to figure out the meaning of unfamiliar words through looking up in the dictionaries provided by the program. Therefore, both top-down and bottom-up processing would construct the creation of meaning (Chun & Plass, 1996).

However some other studies have shown the opposite results. Tseng (2007), found that reading comprehension of the learners can not be improved through the use of multimedia and hypertext. He studied 54 fourth-grade students forming two groups of experimental and control at an institute of technology in Northern Taiwan. At the end of the treatment, reading comprehension of the learners was measured through comprehension questions. The outcomes of the study demonstrated that even though screen technologies have rapidly improved in recent years, the

students still like to read texts on paper, especially while doing an examination. The result of such poor performance was connected with the high eye strain that the learners experience during reading on the computer screen.

Nielsen (1995) has shown that "reading from a computer screen is about 30% slower than reading from paper" (p. 154). Difficulties that affect reading from a computer screen are as follows (Troffer, 2001):

•Screen resolution is low as compared to printed text.

•Screen glare can impair reading.

•Letters on a computer screen appear coarse to the eye.

•Desktop computers are not portable and are less convenient to use than printed material.

Britt and Gabrys (2001) also stated that the weak point in hypertext is that its textual devices which construct the text's coherence are removed. Therefore, students themselves are responsible for integrating what they had learnt before with what they were going to read and the task adds to the complexity and the cognitive demands on the students.

The purpose of this study was to examine the comparative effects of using electronic short story books and traditional printed texts on EFL learners' reading comprehension at the intermediate level. The results of the mean score difference in two groups revealed that there is significant difference between the performance of the students in electronic and non-electronic groups and that electronic group outperformed in answering the open-ended questions as the post test. In other words, as far as reading comprehension of stories is concerned, this study proved that utilizing electronic devices helps EFL learners improve their reading comprehension compared with the traditional method of reading stories in print.

A previous research done by Greenlee-Moor and Smith (1996) demonstrated that students reading material that is considered above their reading ability perform better in hypertext situations than in print, and that students of below grade reading ability perform better on CD-ROM than in print (Greenlee-Moor & Smith, 1996; Reinking & Bridwell-Bowls, 1991).This last point is confirmed by the present study. The electronic short stories were offered to the students in CD-ROM format and as the students were lower intermediate learners of English, the probability

of their improvement in reading comprehension was anticipated by the researchers from the beginning of the study.

This suggests that hypertext medium may be particularly suitable for presenting information that is difficult to understand for a particular audience and that is above the level of the learner. On the other hand, the presentation of comprehensible and easy texts through CD-ROM would be beneficial for the learners of low reading ability performance.

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