The Impact of the Educational Software on First Grade Students' Reading Skills: Morpa Kampüs Application*

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Abstract

The purpose of this study is to evaluate the impact of educational software which is used for reading instruction on reading skills of first grade students. In the study, quasi-experimental posttest control group design was used. The study group is formed by first grade students from an elementary school in Ankara during 2012-2013 academic years. There are24 students in each experimental and control groups. According to the study, phonological awareness scores of experimental group students are significantly higher than that of control group students. Even though experimental group students scored higher in reading comprehension skills, there is no significant difference between experimental and control groups reading comprehension skills scores. Experimental group students made fewer reading errors compared to control group students. All students in experimental group completed reading the text but some students in control group could not finish reading it. Experimental group students read more words correctly per minute than control group students. It is concluded that there is no significant difference in prosody competency scores of both groups.

Keywords: Educational software, reading skills, reading instruction.

Introduction

Having effective reading skills has been inevitable in order to have easy and fast access to knowledge and information for individuals living in today's society in which information and communication technologies are rapidly changing. Mankind has the desire and the need of learning to develop and to adapt itself to new situations throughout its life. Knowledge is considered the foundation of innovation and production especially in the 21st century which is also expressed as communication, information or technology age. Advances in information and communication technologies have changed the means of access to information resources. Castek, Leu, Coiro, Gort, Henry and Lima (2008) states that the Internet is the decisive technology of literacy and learning skills of this century.

Today it is vital to have the abilities of analyzing missing or required information; accessing to sources of information; and having selective and critical perspective. According to Leu (1997), as new technologies emerge, different skill sets are needed and continuous development of skills is required. Since learning to read will form the basis of future academic success of elementary school age students, it is one of the most important skills they must acquire (Stevens, Slavin and Farnish, 1991). So all the factors affecting the development of this skill must be studied in detail for them to acquire reading skills at desired level National Reading Panel (NRP, 2000) stressed the importance of Phonological awareness for effective reading instruction, reading comprehension, fluency and correctly, reading rate, and prosody. Therefore, in this research, educational software was evaluated on the mentioned aspects.

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The Purpose of This Study

The purpose of this study is to evaluate the impact of educational software which is used for reading instruction on reading skills of first grade students. For this purpose, the study considers the following research questions: 1) Are there any significant difference between students in experimental and control groups in their phonological awareness scores? 2) Are there any significant difference between students in experimental and control groups in their reading comprehension scores? 3) What are the level of experimental and control group students' reading errors? 4) What are the level of reading speed of students in control and experimental groups? 5) Are there any significant difference between students in experimental and control groups in their prosody competency scores?

Method

Research Model

In this study, posttest control group design was used. In the posttest control model, there are two groups: One is experimental group and the other is control group. Those groups are formed by random assignment. At the end of the experiment, only group posttest measure is applied for evaluation (Karasar, 1991, p. 98).

Study Group

The study group consisted of first grade students from an elementary school in Ankara during the 2012-2013 academic years. Experimental group is section 1-A and control group is section 1-B in that elementary school.

Data Collection Tools

"Phonological Awareness Scale" that is developed in 2008 by Yangın, Erdoğan and Erdoğan was used. The highest score is 35, taken from the scale. Three experts in the field provided the content validity of the scale, and its reliability as 0.74. The scale was examined by researcher, her supervisor, and five first grade teachers as experts in the field. It is applied to experimental and control groups by the researcher one on one. On each student, a description of each task and three trials were made and implemented. Scores of each student were determined by assigning one for correct responses and zero for incorrect responses for five tasks each has seven specific tasks.

Reading Rate, Reading Errors and Prosody Scale

To determine the reading speed in minutes, identify level of error and prosody competency of students in both experimental and control groups, text prepared by Erdoğan in 2009 was used. While pilot applications of text and scales on twenty first graders one on one implemented, student readings were audio recorded. It was found that the text was not appropriate to student level, it was above level, when reading speed, reading errors and prosody results were evaluated. After that researcher, her supervisor, five first grade teachers as experts in the field, and a Turkishteacherworkedtogethertomakenecessaryarrangementsandchanges on the text. Modified text was read by ten different first graders with equivalent reading and writing levels.

New text was then read by experimental and control groups and the resulting video image is recorded as data. To detect errors before evaluation, on the basis of previous research in the field, expert opinion of first grade teachers, and the researcher's experience five types of reading errors were identified as criteria: skipping, additions, repetitions, false readings, reversing. At the end of all the sounds were taught, student readings were recorded as a video display. Then obtained video footage was viewed by two experts and the researcher separately. The data about reading errors were obtained.

The data recorded from the student readings were re-examined by researcher and a field expert. They calculated number of words read correctly in a minute and the number of errors, if any, is subtracted from number of words to determine the reading rate. To determine whether prosody results have significant differences "Prosody Scale" prepared in 2011 by Ulusoy, Ertem and Dedeoğlu was used. The obtained video footage in which students read the text has been studied by researcher and two experts. The prosody competency data was obtained with the consensus of experts and the researchers.

Reading Comprehension Scale

"Reading Comprehension Scale" prepared for first graders by Erdoğan in 2009 was used. Its reliability is 0.80. The scale was examined by the researcher and her supervisor and has been found suitable for the research. The scale was replicated and applied to the experimental and control group students by the researcher and an expert.

Students' reading comprehension scores were calculated as each correct answer receives one point and each incorrect answer earns zero points.

Process

Data were collected by the researcher. Before the research implementation, to be able to practice in public schools necessary permits have been obtained from the Ministry of Education, National Education Directorate in Ankara, and School District. Between the dates of December 2012 and April 2013, Morpa Kampüs educational software's "I Learn Literacy" section was applied to experimental group students and Ministry of Education's "Reading and Writing Programs" was applied to control group students. After completion of applications in April 2013 to the students of both groups, Phonological Awareness Scale and Reading Comprehension Scale data were recorded on the forms. In May, video footage was examined to determine reading speed and reading errors. The errors were detected. According to the video displays the Prosody Scale form was filled out.

Data Analysis

To analyze the data in this study, SPSS 18.0 (Statistical Package for the Social Sciences) software package was used. Accordingly, independent samples t-Test was applied to posttest mean scores for comparison with respect to Phonological Awareness Scale, Reading comprehension scale and Prosody Scale. For analysis, the significance level 0.05 was considered for interpretation purposes.

Findings

In this section you will find findings obtained from the data of phonological awareness, reading comprehension, reading speed in minutes, reading errors, and prosody competency, and their interpretations.

Findings Related to Students' Phonological Awareness Skills and Interpretation

To determine whether students in experimental and control groups exhibit significant difference in their phonological awareness scores, t-Test for Independent Groups was performed and results of analysis are given in Table 1.

Table 1: Experimental and Control Group Phonology Awareness t-Test Results

Group	N	$\overline{X}$	S	Sd	t	P
Experimental	24	6.74	.23	46	7.370	.000*
Control	24	5.16	1.03			

*p<.05

Analyzing data in Table 1, there is a significant difference between the phonological awareness scores of control and experimental group students [t(46)=7.370, p<.05]. The phonological awareness scores of experimental group students (6.74) exhibit higher scores than that of control group (5.16).

Findings Related to Students' Reading Comprehension Skills and Interpretation

To determine whether students in experimental and control groups exhibit significant difference in their reading comprehension scores, t-Test for Independent Groups was performed and results of analysis are given in Table 2.

Table 2: Experimental and Control Group Reading Comprehension t-Test Results

Group	N	$\overline{X}$	S	Sd	t	P
Experimental	24	9.83	.48	46	1.763	.085
Control	24	9.00	2.27			
*p<.05						

Analyzing data in Table 2, there is not a significant difference between the reading comprehension scores of control and experimental group students [t(46)=1.763, p>.05]. Even though the results of t-Test analysis made using reading comprehension scores of Control and experimental group students do not exhibit any significant difference, the reading comprehension results of experimental group ($\overline{X}$=9.83) is higher than that of control group ($\overline{X}$=9.00).

Findings Related to Students' Reading Errors and Interpretation

To determine the experimental and control group students' reading errors of previously identified criteria as "skipping, additions, repetitions, false readings, reversing", error frequency and total percent errors are calculated and findings are showed in Table 3.

Table 3. Experimental and Control Group Students' Reading Error Distribution

Error Sources	Experimental Group			Control Group		
	N	*f*	%	N	*F*	%
Skipping	24	4	2.99	24	38	17.67
Addition		11	8.21		11	5.12
Repetition		11	8.21		34	15.81
False Reading		107	79.85		131	60.93
Reversing		1	0.75		1	0.47
TOTAL	24	134	100	24	215	100

Analyzing data in table 3; there are total 134 errors made by 24students in experimental group. Among these errors; skipping four times, additions eleven times, repetitions eleven times, false reading 107 times, and reversing once. There are total 215 errors made by24students in control group. Among these errors; skipping 38, additions 11, repetitions 34, false reading 131, and reversing once. All students in experimental group finished reading the text but three students in control group did not want to continue reading and could not finish the text. When the common reading errors and mistakes are examined in both groups they can be listed as follows:

- Words that start with the same sound are mixed up. For example, when the word "tavuk" is seen it was read as "tavşan".
- Based on the meaning of the sentence, they made additions to the words. For example instead of "ederseniz" they read as "eder misiniz?", or in place of "sulayamadı" they read as "sulamadı".
- Experimental group students generally made the following mistakes:
- Mistakes are made when the words have suffixes which make their negative forms. For example instead of "sulayamadı" they read as "suladı".
- Control group students generally made the following mistakes:
- Dotted letters are mixed up with corresponding letters without dots. Examples: Instead of "mısır" they read as "misir", or in place of "işe" read as "ise", or instead of "kış" they read as "kis".
- They made mistakes especially words that contain "ğ", "h" and "v" sounds. Examples: Instead of "tavuğun" they used "tavugun", in place of "tohumları" they read as "toumları", instead of "hepsini" they read as "epsini", instead of "tavşan" they read as "tavuşan".
- They mixed up"s" and "z" sounds. For example, instead of "zor" they read as "sor".
- They made mistakes wherever the juxtaposition of two consonants. For example, these words are read incorrectly: "yardım", "arkadaşlar", "etmedi", "tavşan".

Findings Related to Reading Speeds and Interpretation

To determine reading speed of students in control and experimental groups, the arithmetic mean of number of words read aloud per minute is calculated and shown in Table 4 along with analysis results.

Table 4. Reading Aloud Speed of Experimental and Control Group Students (Words per Minute)

GROUPS	N	$\overline{X}$
Experimental	24	42.13
Control	24	38.17

Analyzing data in table 4; Experimental group students who used the educational software have read more words per minute ($\overline{X}$ =42,13) than control group ($\overline{X}$ =38,17) who did not use the software.

Findings Related to Prosody Competency and Interpretation

To determine whether students in experimental and control groups exhibit significant difference in their prosody competency scores, t-Test for Independent Groups was performed and results of analysis are given in Table 5.

Table 5. Experimental and Control Groups Prosody Competency Scores t-Test Results

Group	N	$\overline{X}$	S	Sd	t	p
Experimental	24	3.16	.94	46	1.436	.158
Control	24	2.71	1.19			
*p<.05						

Analyzing data in Table 5, there is not a significant difference between the prosody competency scores of control and experimental group students [t (46) =1.436, p>.05]. Even though the results of t-Test analysis made using prosody competency scores of control and experimental group students do not exhibit any significant difference, the prosody competency results of Experimental group who used educational software ($\overline{X}$=3.16) are higher than that of control group ($\overline{X}$=2.71).

Results and Discussion

Phonological awareness scores of the students in the experimental group compared to the control group students differ significantly in favor of experimental group. Rubba (2004) states that many experts are suggesting the education of phonological awareness skills are prerequisite to reading and writing education. According to the research conducted, students who learned reading skills by educational software in experimental group have higher phonological awareness scores. Therefore, educational software could be beneficial to teach reading while students are acquiring phonological awareness skills. Phonological awareness is also defined as the knowledge of being aware of the fact that words form sentences, syllables form words, and sounds form syllables (Allor, 2002). Phonological awareness is a vital skill for a child to acquire reading skills (McGee and Morrow, 2005). Since the experimental group students exhibited higher phonological awareness scores which is considered a precondition for reading skills, it can be concluded that educational software will help raise quality readers. Moreover, this result shows similar data with another study of the effects of phonetics education on children who have difficulty of learning reading skills (Foorman, Francis, Fletcher, Schatschneider and Mehta, 1998).

There is not a significant difference between the reading comprehension scores of the students in the experimental group and that of control group. This conclusion does not show similarities with either the study done by Bay (2009) in which he examined the effects of computer on students' reading comprehension level and found that student who used computer exhibited better reading comprehension skills nor the study done by Ertem (2010) in which he analyzedreadingcomprehensionskillsfoundthatstudentswithreadingdifficulty will have better comprehension of story books with different presentation media. However, the results are consistent with the research done by Orhan (2007) in which he examined the impact of computer-aided instruction on reading and writing success and found no effect on students' reading comprehension.

In this research, it was found that reading slowly or having errors while reading did not create big differences in reading comprehension scores. The emergence of this result may be attributed to the facts that both group students have similar socio-economic, environmental or cultural backgrounds. It may be due to the fact that school administration formed the classes with similar pre-school education levels, age and gender. Reading is a highly complex mental activity (Akyol, 2005, p. 1). Therefore, this situation can be explained by different variables. Experimental group students have made fewer mistakes of "skipping, repetitions, false reading" compared to control group students. The application of multi-media activities in experimental group who are more successful in terms of degree of accuracy supports the study of Yıldız (2010). Although three students in control group could not complete reading the test, all experimental group students finished reading it. This situation can be interpreted as educational software improves the self-confidence of students, and encourages them to read. It was observed that students in experimental group who utilized educational software voiced sounds normally whereas students in control group stressed the letters “ğ”, “h”, “v”, and “r” frequently. These results are consistent with the results of Mitchell and Fox's (2001) study which concluded students developed their reading skills. In their study they studied the effects of educational software on two pre-school and first grade student groups who experienced problems with reading and mixing sounds. The reason for this case could be that teacher of experimental group may stressed when these letters “ğ”, “h”, “v”, and “r” are sounded.

Teacher of experimental group can have students repeat many times tirelessly listened to the sounds using educational software. It is difficult to sound and voice some letters for both teachers and students. That requires a variety of activities related to that particular sound and its continuous repetition especially at the stage of feeling that sound. So, it could be expressed that educational software made the job of teacher easier and plenty of

activities help sounds voiced. The arithmetic means of number of correctly read words are calculated when control group and experimental group which used educational software read the text. On average experimental group students read more words than control group students without error.

There is no significant difference between the prosody competency scores of experimental and control groups. This result did not support the findings of Burns, Roe and Ross (1996) in which they found computer-aided instruction improved reading as many children had more efficient and fluent readings in many classrooms. However, that supports the results of the study done by Bay (2009) in which he examined impact of computer on reading skills and he observed that a significant difference in favor of students who used computer in seating structure, tone, and following reading rules.

In the study it was observed that experimental group students tried to read long words by hyphenating them correctly when they encounter first time and did hyphenate correctly (ar-ka-daş-la-rın-dan), but control group students mishyphenated (ark-a-daş-lar-ın-dan). This can be interpreted as educational software helps gaining strategies to correctly read the words when they are encountered first time. The prosody competency score results of experimental and control group students are consistent with Akyol's statement (2003, p. 142) who transfer's from Torgesen: "Generally, successful readers will use automatic word recognition skills at the end of second or third grades".

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