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The Effect of Digital Stories on 4th Grade Students' Fluent Reading Skills[1]

Mesut Kandemir
Milli Eğitim Bakanlığı, Sarıbuğday İlkokulu, *mestkandemir@gmail.com*

Yalçın Bay
Anadolu University, *yalcinbay@anadolu.edu.tr*

This study aims to determine the effect of the digital stories on the fluent reading skills of primary school 4th-grade students. A quasi-experimental design with a pre-test and post-test control group was used in the study. The participants comprised 46 4th-grade students from the villages of the Silvan district of Diyarbakır Province. Twenty-three students formed the control group, and 23 formed the experimental group. The study was conducted in eight weeks in the 2022-2023 academic year. In this process, first, students' fluent reading skills were measured before the treatment. Then, eight reading passages were prepared in digital story format and used in Turkish lessons. When the treatment ended, the fluent reading skills of the students were measured again. Independent Sample t-test was used to determine significant differences between the experimental and control groups. The results indicated no significant difference between the initial fluent reading levels of the groups. In this context, it can be said that the use of digital stories in reading activities improves students' fluent reading skills.

Keywords: digital story, fluent reading, reading, students, fluent reading skills, primary school

INTRODUCTION

Individuals can perceive and understand what is written through reading. Bay (2010) defines reading as the perception and understanding of the shapes, symbols and pictures determined by societies in order to make feelings, thoughts, experiences and impressions permanent in a universal sense and to transfer them to the other party.

Through reading, individuals gain comprehension, analysis and criticism skills and expand their vocabulary. It also improves expressive language skills, such as speaking and writing, and facilitates communication and interaction (Akyol, 2011).

The words and sentences perceived in the reading process are continuously transferred to memory, and the whole meaning is reached using the reader's pre-knowledge. This meaning is transferred to long-term memory, and reading and comprehension are realized (Akyol, 2005). In this context, considering that the primary objective of reading is comprehension, it is necessary to purify reading from the effects that make comprehension difficult during reading (Baştuğ & Keskin, 2012). In order to overcome these difficulties, intensive reading (Stanovich, 1986) and frequent repetitions (Samuels, 1979) are recommended as fundamental principles. In conclusion, reading is expected to be fluent (Logan, 1997; Samuels, 1979).

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Fluent reading is reading done in a conversational style by paying attention to punctuation marks, emphasis, and intonation, not repeating words, phrases and sentences without spelling, not stopping outside the stopping points, observing the parts of meaning (Akyol, 2011). The preliminary readiness skills that form the basis of the three essential components of fluent reading are word recognition and discrimination. Comprehension cannot be realized without these skills; thus, a reader lacking these skills will spend his or her energy trying to understand instead of reading fluently. The lack of these skills will cause some reading errors in individuals who have not developed fluent reading skills. These are failing to focus on reading, skipping, additions, reversals and repetitions (Akyol, 2013). Reading fluency is determined by measuring speed and accuracy through reading aloud (Eppard et al., 2020). The functional running of fluent reading is closely related to the correct understanding and transfer of its three essential components: accuracy, speed, and prosody.

Reading accuracy is the correct perception and discrimination of words. It can also be expressed as the percentage of correct words read in a minute (Massey, 2008). Accurate reading includes perceiving words correctly, knowing the alphabet rules, and vocalizing sounds accurately (Ehri & Sandra, 1998). The percentage of correct word reading should be 98% for fluent reading to be realized (Piper, 2010, as cited in Baştuğ, 2012). Reading speed refers to the number of words read in one minute. In other words, it is the brain's recognition of more words in a certain period (Beydoğan, 2012). Although word recognition is essential for fluent reading, it is insufficient alone (Adams, 1990; Stanovich, 1991). The reader must perceive the word correctly and maintain an appropriate speed. Prosodic reading is the third component of fluent reading. Prosody is a word used to express the elements of rhythm and intonation in speech together (Dowhower, 1991, cited in Baştuğ & Akyol, 2012). Reading a text fluently is not only about speed and accuracy. Reading the text with emotion, meaning, emphasis, and intonation, in short, prosodic reading, is also an essential element of fluent reading (Hook & Jones, 2004; Kuhn, 2005). Rasinski (2004) states that students could not perceive texts correctly without acquiring prosody skills. Developing reading accuracy, reading speed, and prosodic reading skills, which are the components of fluent reading skills, enable students to read effectively and improve their reading comprehension skills.

Literature

When research on the development of reading skills is examined, it is understood that digital materials can be used in this field with the developing technology (Collier, 2013; Fox, 2014; Sylvester & Greenidge, 2009). One technological tool that can be used in reading skills is digital stories. Digital storytelling is the combination of images, graphics, voiceover, and music elements with traditional and personal storytelling (Porter, 2004). Hathorn (2005) describes the digital story as a program innovation that combines language, literacy, and communication skills with technology. Digital stories are digital educational materials created by combining visuals, audio recordings, streaming text, audio, or video related to a particular topic in a digital program. Robin (2008) states three types of digital stories: personal or narrative stories that reflect an individual's personal experiences, informational or instructional stories that include course topics and facilitate learning of courses, and stories about historical events that address historical events and are used in history teaching.

Digital stories consist of seven interconnected elements, which make them effective for the audience: point of view, dramatic question, emotional content, economy, pacing, the gift of your voice, the power of the soundtrack, and the overall purpose of the story (Bull & Kajder, 2004; Bumgarner, 2012; Robin, 2006; Satterfield, 2007). All elements of a digital story should have a dynamic interaction with each other. Therefore, care should be taken to ensure all elements are harmonious. A digital story is two to five minutes long and contains elements such as video, figures, audio, photographs and text and is prepared to tell a particular subject or event (Doğan & Robin, 2008; Garrety, 2008; Garrety, 2008; Kulla-Abbott, 2006; Maddin, 2011).

Students can turn their experiences in their daily lives, culture, and history into a story by creating a composition with a digital story. So, the digital story significantly impacts the structuring of literacy identity at home, community, and school (Foley, 2013; Vasudevan et al., 2010). The digital story allows teachers to adapt digital technology with a certain system in reading activities (Butler et al., 2013). Digital stories are digital materials that can be used to integrate the competence of managing information and communication technology required by the 21st century into the classroom environment (Saripudin et al., 2021). However, it is understood that the digital story has positive effects on students' story writing attitudes and the development of digital literacy skills (Eroğlu, 2020). Kulla-Abbott (2006) states that digital stories develop students' traditional and multimedia reading skills at the same time. Robin (2006) states that digital stories provide students with research, organization, technology, presentation, interviewing, social, problem solving, and analysis skills along with reading and writing skills. Digital stories offer students a model reading prosody with voice-over learning. Students can perceive the emphasis and intonation in the text, the way the words are read, and the speed at which reading should be done through digital stories. In addition, the fact that digital stories are supported by visuals strengthens students' associations with the object and its reading.

It is understood in the literature that digital stories are used for the structure of fluent reading skills at different ages (Hani, 2014; Karaoğlu, 2021; Skinner & Hagood, 2008; Şentürk Leylek, 2018; Yılmaz et al., 2017). It is understood that some of these studies were prepared by the breeders of digital stories (Karaoğlu, 2021; Şentürk Leylek, 2018) and some of them were prepared by researchers (Özerbaş & Öztürk, 2017; Skinner & Hagood, 2008) and were used from parts of the progressive reading periods. However, such a life has not been encountered for immigrants who live in rural areas and do not have faith in accessing digital materials. The fact that this study brings together students studying in a primary school in a rural area with inadequate technological facilities with digital materials is thought to contribute to the relevant literature in terms of examining the effect of digital stories on the fluent reading skills of these students.

Problem and hypotheses of the resarch

This study aims to determine the effect of digital stories on the fluent reading skills of 4th-grade students studying in a primary school in a rural area. In line with this objective, the following questions were addressed:

a) What is the fluent reading skills level of the experimental and control group students before the treatment?
b) To what extent does the use of digital stories in reading activities affect students' fluent reading skills?

It is assumed that the use of digital stories in fluent reading activities of primary school students will contribute positively to the development of students' fluent reading skills.

METHOD

A quasi-experimental design with a pre-test and post-test control group was used in the study. In this design, two selected groups are compared based on specified variables (Büyüköztürk et al., 2008). The research design is shown in Table 1.

Table 1
The research design

Groups	Pre-Test	Treatment	Post-Test
Experimental group	Prosodic reading, reading speed, and correct reading rate	Reading activities using digital stories	Prosodic reading, reading speed, and correct reading rate
Control group	Prosodic reading, reading speed, and correct reading rate	Reading activities without using digital stories (reading aloud and silent reading methods)	Prosodic reading, reading speed, and correct reading rate

Acording to Table 1. in this study, reading prosody, reading accuracy and reading speed skills of the experimental and control group students, which are the components of fluent reading, were measured before the treatment. Then, digital story-based fluent reading activities were conducted for experimental group. In this process, reading activities in the control group were carried out without using digital stories (reading aloud and silent reading methods). After the treatment is over students' reading prosody, reading accuracy, and reading speed skills were measured again. Finally, the initial and final measurement scores were compared and interpreted.

Data collection tools

Students' video recordings were watched to measure their fluent reading skills. Scoring and calculations for reading speed, reading accuracy, and prosodic reading skills were made separately, and the measurements were transferred to the scoring sheet.

Measurement of Reading Speed: Reading speed, reading accuracy determine fluent reading skills. Measuring reading speed: determining reading speed, reading accuracy and reading fluency. As widely used in the literature, program-based measurement was used to measure students' reading speed and reading accuracy (Caldwell, 2008; Deno, 1985; Rasinski, 2004; Yeo, 2008). Reading speed is the number of correct words read in one minute (Deeney, 2010). Accordingly, students' reading speed in one minute was determined from the formula "Number of words read correctly = Total number of words read - number of errors made". In this context, students were made to read a text that they had not read before. The readings of the students were video-recorded. Afterwards, the videos were watched one by one and the total number of words they read in one minute and the number of words they misread were noted. Finally, the reading speeds were determined using the formula mentioned above.

Measurement of Reading Accuracy: The formula used to calculate the accurate reading, another fluent reading component, was "Accurate reading = (Number of words read correctly / The total number of words read) x 100". Formula for Measuring Reading Accuracy, used to calculate reading accuracy, a component of reading fluency: Accurate reading = (Number of words read correctly / Total number of words read) x 100. These formulas were used in this study because they comply with program-based measurement rules and are accepted in terms of validity and reliability (Keskin, 2012). Moreover, the elements accepted as errors in students' reading should be identified to make healthy measurements. Within the scope of the study, repetitions, skips, additions, reversals, and substitutions were accepted as errors (Akyol, 2008; Mellard et al., 2011). In this direction, recorded reading videos were used to calculate the correct reading rates of the students. The correct reading rates were calculated by using the total number of words that the students read and the number of words they read correctly in accordance with the above-mentioned formula.

Measurement of Prosodic Reading: The Prosodic Reading Scale (PRS) developed by Keskin et al. (2012) was used to measure prosodic reading skills. It is a Likert-type scale consisting of 15 items. The scale aims to measure the aspects such as intonation, emphasis, reading with meaning units, reading by reflecting the emotion in the text, reading rhythm, and sound characteristics. The items in the scale are scored as Always observed (4), Mostly observed (3), Occasionally observed (2), Rarely observed (1), and Never observed (0). A field expert and the researcher scored video recordings to ensure scoring consistency. The correlation coefficients between the scores were also calculated.

Participants

Fourth-grade students from a village primary school with eight classrooms in the Silvan district of Diyarbakır Province formed the experimental group of the study. The number of students enrolled in the class was 24, and 23 were regular students. One student was a full-time mainstreaming student who was frequently absent or rarely attended school due to an intellectual disability. Accordingly, the students were identified as the study participants and the "voluntary participation consent form" was signed by the parents.

The fluent reading of 4th-grade students attending five primary schools in neighboring villages of the same region and with a similar socio-economic level, including the study's experimental group, were evaluated regarding reading speed, reading accuracy, and prosody skills. Fourth-grade students from another school with similar average scores and class sizes to the experimental group were selected as the control group. The class size of the control group was 26. 1 student was constantly absent, and the parents of 2 students did not sign the parental consent form. Therefore, the study continued with 23 students in the control group.

Treatment

The treatment was performed in 16 hours in eight weeks, two hours a week. In preparation, the researcher took eight reading passages from the primary school 4th-grade language textbook and converted them into digital story format. In the process of preparing digital stories, the texts were first transformed into visual compositions by an art teacher and an average of seven pictures were obtained for each digital story. While creating the pictures, not much detail was given. Care was taken to create pictures in a way that would allow students to make mental completion and predictions about the texts they listened to and read. In some digital stories, it was necessary to add visuals based on expert opinions; these visuals were obtained from the internet by observing copyrights. In the next stage, the vocalization of the texts was carried out. For this purpose, a teacher with a diction certificate was consulted. The teacher vocalized all the texts with a smooth prosody and a fluent and smooth reading. Since the length of the digital story is determined by the duration of the vocalization of the text, the texts were simplified to a maximum of 3:30 minutes when deemed necessary, taking into account the digital story durations predicted in the literature. During this process, care was taken not to disrupt the meaning and flow, and again the opinions of field experts were consulted. After the vocalization studies were completed, the stage of selecting background music for digital stories was reached. At this stage, care was taken to ensure that the music to be selected did not contain copyright and that the music selected was compatible with the subject, meaning, and values in the digital stories. The documents required for each stage were saved separately in the digital environment with the relevant text name. Finally, the components of the digital story were put together through the "Momavi Editor Plus" program and started to be created. At this stage, it was decided how the transitions between the pictures would be and how long the transition time would be. Finally, the digital stories were converted into "mp4" video format and saved with text captions to be compatible with video playback programs on the computer.

The digital stories were submitted to the evaluation of three experts who worked about digital stories. The experts analyzed the digital stories by considering all elements. Necessary corrections were made

in line with the feedback from the experts and the digital stories were presented to the experts again. After the approval of the experts, the digital stories were put into use in the treatment process. The digital stories were prepared by taking into account the seven elements (point of view, interesting question, emotional content, economy, speed, good voice-over, and use of music) and five stages (writing the story, preparing the audio recording, creating the visuals, determining the music, and combining the elements) stipulated in the literature. During the activity process, the digital stories were first watched by the class. Each digital story was watched at least twice, taking into account the students' willingness. After watching the digital story, the text was distributed to the students and only the audio element was played and the students were allowed to follow the text. In this process, the researcher guided the students on the issues to be considered regarding reading prosody by stopping the digital story when deemed appropriate. Thus, approximately 15 minutes of the two weekly class hours were devoted to the process of watching and listening to the digital story. After the watching and listening activities were completed, reading aloud and silent reading activities were conducted. In the read-aloud activities, the researcher guided the students by playing the relevant part of the digital stories where necessary.

In the control group, the process continued with the same text and activities without using the digital story. The teacher in the control group first read the text herself, and then practiced reading aloud and conducted silent reading activities with the students.

Data Collection Process

Students were asked to read a text they had not read before and recorded to see their reading speed, reading accuracy, and prosodic reading skills before the treatment. Then, fluent reading elements were measured separately, i.e., reading speed, reading accuracy, and prosodic reading. When the treatment was over, reading accuracy, reading speed, and prosodic reading skills of experimental and control group students were measured as in the pre-test, using a text that the students had not read before.

Data analysis

Before proceeding to the first stage of the analysis, the suitability of the data for parametric test conditions was ensured. For this purpose, the data's normality distribution was checked, and kurtosis and skewness values were determined. The Shapiro-Wilk value should be greater than 0.05, and kurtosis and skewness values should be between -1.5-+1.5 for data with a sample size of 50 and below to be accepted as normally distributed, as suggested by Tabachnick and Fidell (2013). Table 2 shows the normality test results of the Prosodic Reading Scale.

Table 2
Results of kurtosis and skewness values

Scale	Skewness	Kurtosis	Shapiro-Wilk
Prosodic reading scale	.515	-.189	.180

After confirming that the data met the parametric test conditions, the independent sample t-test was conducted. T-test is a parametric test investigating the statistical significance of the difference between means of the two groups (Sekaran, 2003).

FINDINGS

Independent Sample t-test was performed to test the statistical significance of the difference between the pre-test and post-test scores of the experimental and control groups students regarding the components of fluent reading skills, i.e., prosodic reading, reading accuracy and reading speed. Pre-test findings are listed in table 3.

Table 3
Pre-Test findings on fluent reading skills

Prosodic reading	n	x̄	σ	t	p	Difference
Control group	23	1.68	.71	-1.706	.102	-
Experimental group	23	1.96	.64			
Reading accuracy	n	x̄	σ	t	p	Difference
Control group	23	56.13	4.69	-.412	.682	-
Experimental group	23	56.72	5.00			
Reading speed	n	x̄	σ	t	p	Difference
Control group	23	44.08	6.52	1.376	.179	-
Experimental group	23	41.52	6.20			

*p<.05

As Table 3 shows, there was no significant difference between experimental and control group students in the pre-test in prosodic reading, reading accuracy, and reading speed (p>.05). Post-test findings are listed in Table 4.

Table 4
Post-Test findings on fluent reading skills

Prosodic reading	n	x̄	σ	t	p	Difference
Control group	23	1.54	.63	-3.751	.001*	2>1
Experimental group	23	2.39	.87			
Reading accuracy	n	x̄	σ	t	p	Difference
Control group	23	79.13	8.29	-6.629	.000*	2>1
Experimental group	23	91.83	3.93			
Reading speed	n	x̄	σ	t	p	Difference
Control group	23	50.21	11.62	-7.330	.000*	2>1
Experimental group	23	71.82	8.50			

*p<.05

Table 4 shows significant differences between the prosodic reading (t=-3.751; p= .001), reading accuracy (t= -6.629; p<.0005) and reading speed (t= -7.330; p<.0005) post-test scores of the control and experimental group students. Prosodic reading, reading accuracy, and reading speed of the experimental group were higher than the control group.

CONCLUSION & DISCUSSION

There were significant differences between prosodic reading, reading accuracy, and reading speed of experimental and control groups students in favor of the experimental group after the treatment. In this context, it can be said that digital stories improved students' fluent reading skills.

The findings of this study indicate that in the post-test, the experimental group students scored higher in reading speed, reading accuracy, and prosodic reading skills, which are components of fluent reading skills, than the control group students. This result was interpreted as digital stories improved students' fluent reading skills. There are studies supporting these results in the literature. Skinner and Hagood (2008) conducted a study with two students from different ethnic backgrounds, one from kindergarten and the other from high school. They found that digital stories improved their prosody skills, reading speed, and reading accuracy. When the study is analyzed in terms of the participants of the study, it does not overlap with the participants of this study. However, there is a similarity in terms of the preparation of digital stories by the researchers and their use in students' reading skills.The results of the study by Hani (2014) reported that digital stories improved students' fluent reading

skills. In this study, digital stories were used as a method for teachers to deliver digital materials to students in schools with insufficient digital resources in reading and writing education. In this respect, it is seen that there is a similar approach with the approach of this study. However, in that study, some elements of the digital stories were created with the students. In this study, all elements were prepared by the researcher and put into use in reading and writing education. Özerbaş and Öztürk (2017), in their study with 5th-grade students, found that digital stories increased students' reading achievement. In this study, pre-prepared digital stories were used in Turkish lessons. In addition, how students' reading motivation was shaped was also examined. The researchers found that digital stories increased students' reading motivation. In the interview-based data of this study, students' positive views towards reading with digital stories were interpreted as a similarity. In their study conducted with 6th-grade students, Yılmaz et al. (2017) concluded that the use of digital stories in language lessons improved students' prosodic reading skills. In this study, digital stories were created by the researchers. However, in line with the possibilities of the research environment, each student was allowed to access the digital stories individually through digital media. In this study, digital stories were watched collectively using a projection device in line with the possibilities of the research environment. On the other hand, some studies have found that digital stories prepared by students improve students' fluent reading skills more than pre-prepared digital stories (Duran & Topbaşoğlu, 2015; Kulla-Abbott, 2006; Kurudayıoğlu & Bal, 2014). As a result, it was determined that previous studies on the subject were similar to the results of this study.

This study examined the effect of using digital stories in language lessons in rural areas on students' fluent reading skills. In this context, suggestions for future research in this field are as follows:

- This study is limited to 4th-grade students in a primary school in a rural area. The effect of digital stories on reading skills can be researched by providing large-scale participation on an appropriate project ground.
- The effect of using digital stories on students' reading attitudes and motivation can be researched.
- The effect of digital stories in teaching first reading can be researched.
- The effect of using digital stories at different levels and disciplines can be researched.
- Since language skills are interactive elements, the simultaneous effects of digital stories on listening, speaking, reading and writing skills can be examined.
- Researchers can compare digital materials reflecting the multiple learning theory with the digital story format.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

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