Reading environment and fluent reading skills

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ARTICLE INFO	ABSTRACT
Received: 24 Aug. 2022 Accepted: 18 Oct. 2022	Language skills have an important place in people's thinking, understanding people around them and expressing themselves. Reading skills, which are among the other language skills, play a vital role for an individual in adapting them into his daily life. Reading should not be interpreted as recognizing merely the letters, the word and articulating them. In addition to understanding what is written, being able to read fluently is also one of the skills that need to be developed in reading teaching. In today's developing conditions, thanks to the effective use of technological tools in every aspect of our lives reading is not only done on paper, but also on the screens of many different technological devices. Considering all these, reading on the screen is different from reading on paper, and the development of reading skills from the screen is currently necessary as well as the development of paper reading skills. The aim of this research is to determine the role of the reading environment on fluent reading skills. 24 students who were enrolled in the third and fourth grades of a primary school in the center of Bartin participated in the study. The demographic features of the students such as gender, class, possession of technological tools (computer, tablet, smart phone, etc.), and duration of use of technological tools were identified using a personal information form. Using a formula developed for Turkish by Atesman (1997), which permits estimating the readability level of the text based on word and sentence length, a text consisting of 189 words with an "easy" readability level was chosen in order to test the students' fluency in reading. This text was read by the students both on paper and on the tablet computer screen, and their fluent reading skills were evaluated. In the end of the research, it is determined that the number of words students correctly read, the rates of their correct reading and prosodic reading skills differ according to the time of using a computer in reading from the screen; the number of words read correctly differs according to the time it takes to have a tablet computer in reading from paper; the classes differ in both paper reading and screen reading in favor of the 4th classes, whereas the correct reading rates differ only in paper reading. In line with the results of the research, suggestions were made to support the use of electronic media in schools and improve reading skills by supporting the use of technological tools.

Keywords: screen reading, paper reading, fluent reading skills |

INTRODUCTION

Language abilities play a significant role in how people think, comprehend those around them, and express themselves. Hearing in the womb is the first step in language learning. When a youngster opens his eyes to the world, he learns the names of things by putting what he hears and sees together. By employing the words, he has already learnt, the child improves his speaking abilities. When a child joins school, reading and writing skills are added to their listening and speaking abilities, which are among the crucial communication skills that emerge throughout infancy. After this stage, reading proficiency has an impact on a person's life as one of the fundamental abilities that facilitate learning, because reading skill plays an active role in the adaptation of the individual to daily life.

According to Akyol (2013), reading is a dynamic process that involves the reader and author interacting with each other in order to make sense of what is being read. Reading, which is a process in which prior knowledge and information from the text are integrated and re-interpreted, is made up of several different processes involving our eyes, ears, and brain, including perceiving, vocalizing, interpreting, and structuring in the mind, according to Gunes (2013). Reading includes the interaction between the reader's prior knowledge and the printed word (Yusthi, 2014). The shapes that the eye sees on paper are first given meaning in the brain on the basis of letters and then words, and then they can be vocalized. There are many factors that affect this complex process, such as the structure of the language, frequently used letters, whether the words are in the text, and the meaning of the text. For example, according to Gunes (2003, p. 44-45), short and simple sentences are learned better than long and relatively more complex sentences. Gunes (2000, p. 244) states that short and simple words are preferred in daily newspapers, the average word length is five letters in newspaper articles, the average number of letters used in scientific articles is around eight-nine, the reader's reading speed is high in a text consisting of short words, while it is low in a text consisting of eight-10 letter words. It is impossible

for reading that is so complex and affected by many variables not to be affected by the environment (paper or screen), where the text is present (Basaran, 2014).

It is important to comprehend reading as more than merely sounding out the words and letters. Fluency in reading is another talent that needs to be fostered in reading instruction in addition to the ability to comprehend written materials. Fluent reading involves reading aloud, paying attention to punctuation, emphasis, and intonation, avoiding word repetition and backtracking, avoiding syllables, and focusing on meaning units (Akyol, 2006). Given all of these factors, reading ability development is a lifelong process rather than a process that occurs only during the school years.

Because they do not have to worry with word deciphering, fluent readers focus on their reading comprehension (Tankersley, 2005). Fluent readers can therefore comprehend what they read more fully. Numerous investigations in the literature have revealed this situation (Aytac, 2017; Basaran, 2013; Bastug & Akyol, 2013; Bastug & Keskin, 2012; Calet et al., 2015; Clin et al., 2009; Cetinkaya et al., 2016; Kaya & Yildirim, 2016; Kim et al., 2011; Klauda & Guthrie, 2008; Schwaneflugel et al., 2004; Ulu, 2016; Veenendaal et al., 2016; Whalley & Hensen, 2006; Yildirim, 2013; Yildirim & Ates, 2012; Yildiz et al., 2014). In addition, fluent reading skill significantly predicts reading comprehension (Bastug & Akyol, 2013; Groen et al., 2018). For example, Durukan (2014) determined that as the text becomes more difficult, the reading time increases and the level of comprehension decreases. It is very important to develop a skill that is so important for understanding. However, in many studies, it has been determined that students' fluent reading skills are not at the desired level in general, even at a low level, and they have problems in understanding what they read (Armut & Turkyilmaz, 2017; Cayir & Ulusoy, 2014; Keskin, 2012; Keskin et al., 2013; Sidekli, 2010). At the same time, Wolters et al. (2020) found a moderate (.51) relationship between prosodic reading and reading comprehension as a result of their study.

Reading is now based not just on paper but also on the screens of many different technical gadgets, thanks to the effective use of technology in all aspects of our life. As the contents employed with these tools are electronic and transmitted to the user via a screen, the idea of "screen reading," as defined by Gunes (2009), has emerged. Screen reading alters the reader's reading objectives, processes, methods, eye movements, comprehension level, and mental organization abilities (Gunes, 2016). When the studies are examined, there are reading difficulties in screen reading that occur in proportion to the length of the text (Rukanci & Anameric, 2003), students think that reading on the screen will harm their eye health (Bodomo et al., 2003; Ozturk & Can, 2013) and that it is difficult to read on the screen (Chu, 2003), and they do not like to read long texts on the screen (Gunter, 2005). In the study conducted by Aydemir and Ozturk (2012), screen reading motivation levels of primary school 5th grade students were examined. The results showed that students who read from the screen scored significantly lower on both the reading motivation scale and the sub-dimensions of perception of difficulty in reading, reading proficiency, effort/recognition of reading, and social aspects of reading compared to students using printed text. Li et al. (2019) determined in their study that the reader view offered by web browsers increased the reading speed by 5% and increased the visual appeal significantly.

When all of this is considered, reading from a screen differs from reading from a paper. Changes in the reading interface that readers are exposed to cause changes in reading ability (Slezak-Swiat, 2019). Today, it is important to learn reading abilities from screens in addition to those for reading on paper. Indeed, the use of electronic tools in educational environments is increasingly widespread. The complex structure of computers has enabled it to gather more features together than other educational technologies used in educational environments (Yilmaz & Horzum, 2005). Therefore, technological tools have become one of the indispensable elements of the educational environments and have led to changes there (Isik, 2019). Technological tools have not only changed educational environments but have also played a role in the development of individuals in educational environments and in being individuals who adapt themselves to today's circumstances. Therefore, readings made with technological tools have come to the forefront. The aim of this research is to determine the role of the reading environment on fluent reading skills. In this respect, the current study investigates the correct reading rates, reading speeds, and prosodic readings of the texts-on paper and screen-read by the students.

METHOD

Research Design

In keeping with the goal of the study, a relational survey design was used. For the purposes of this study, a relational survey design is appropriate because it permits comparison and correlation (Karasar, 2004). This design provides quantitative or numerical identification of trends, attitudes, or views in the population through studies conducted on a sample selected from a population (Creswell, 2009).

Research Group

In the research, one branch from each of the 3rd and 4th grades of a primary school located in the center of Bartin was randomly selected. Students with no data loss during the implementation phase constitute the research group. Detailed information about the research group is shown in **Table 1**.

Upon the analysis of the data given in **Table 1**, it is observed that there were more female students in the research group; they were equally assigned from the 3rd and 4th grades; the vast majority of students had computers and tablet computers; yet, they had no smartphones; and the vast majority of those with computers and tablet computers have had these technological tools for more than a year.

Table 1. Research group

Variable	Sub-variable	n	Percentage (%)
Gender	Female	13	54.2
	Male	11	45.8
Grade	3rd	12	50.0
	4th	12	50.0
Possession of computer	Yes	20	83.3
	No	4	16.7
Duration of computer possession	Less than one year	4	20.0
	One-three years	7	35.0
	More than three years	9	45.0
	Total	20	100.0
Possession of tablet	Yes	20	83.3
	No	4	16.7
Duration of tablet possession	Less than one year	9	45.0
	One year or more	11	55.0
	Total	20	100.0
Possession of smart phone	Yes	3	12.5
	No	21	87.5
Total		24	100.0

Data Collection Tools and Process

A personal information form was employed as a data collection tool to ascertain the demographic characteristics of the students (gender, class, possession of technological tools -computer, tablet, smart phone-, duration of technology tool use). Using a formula created for Turkish by Atesman (1997), which permits estimating the readability level of the text based on word and sentence length, a text consisting of 189 words with an "easy" readability level was chosen in order to test the students' fluency in reading. The students read this text both on paper and on the tablet computer screen, and their reading fluency was assessed. While evaluating fluent reading skills, accuracy rates of reading, reading speeds and prosodic readings were evaluated. While determining the reading speed of the students, the number of words read in one minute was calculated. The reading speed scores of the students vary between zero and 189. While determining the accuracy rates of reading, the ratio of words read correctly in one minute to the number of words read in one minute was calculated. The accuracy rates of reading of the students vary between zero and 100. The prosodic reading scale (reliability, .98) developed by Keskin et al. (2013) was used to determine prosodic reading skills. The prosodic reading scores of the students vary between five and 75.

Data Analysis

In the analysis of the data obtained at the end of the research, nonparametric tests were used due to the small amount of data. Wilcoxon signed rank test was used in cases where there were two variables in data analysis of dependent groups, Mann Whitney U test was used when there were two variables in data analysis of independent groups, and Kruskal-Wallis H test was used in cases where there were more than two variables. When significant values were obtained as a result of the Kruskal-Wallis U test, the Mann Whitney U test was performed in pairs between the variables.

RESULTS

Reading speed, accuracy rates of reading and prosodic reading skills of 24 students participating in the study are shown in **Table 2**.

When the data in **Table 2** are examined, it is seen that the students' reading speed is good and at a similar level in reading from paper and reading from a tablet computer. These data obtained show that the reading environment has no effect on the reading speed of the students. It is seen that the students' accuracy rates of reading are very good and at a similar level in reading from paper and reading from a tablet computer. These data obtained show that the reading environment has no effect on the accuracy rates of reading of the students. It is seen that the prosodic reading skills of the students are quite good and at a similar level in both reading from paper and reading from a tablet computer. These data obtained show that the reading environment has no effect on the prosodic reading skills of the students.

Table 2. Students' fluent reading skills regarding their paper or screen reading

Variable	Reading environment	n	$\overline{X}$	ss	Z	p-value
Reading speed	Paper	24	110.75	29.62	-.380	.704
	Tablet	24	111.21	29.82		
Accuracy rate of reading	Paper	24	96.20	4.03	-.925	.355
	Tablet	24	95.78	5.19		
Prosodic reading	Paper	24	58.46	19.39	-1.948	.051
	Tablet	24	60.25	18.01		

During the research, 14 students read the text first on paper and then on a tablet computer, while 10 students read it first on a tablet computer and then on paper. The results of the analysis on whether there is a difference in the students' fluent reading skills according to the turn of reading the text are displayed in **Table 3**.

Table 3. Students' fluent reading skills according to their reading turns

Variable	Reading environment	Reading turns	n	$\bar{X}$	ss	U	Z	p-value
Reading speed	Paper	Paper-tablet	14	107.07	31.85	54.000	.937	.349
		Tablet-paper	10	115.90	26.95			
	Tablet	Paper-tablet	14	114.79	24.27	53.500	.967	.334
		Tablet-paper	10	106.20	37.06			
Accuracy rate of reading	Paper	Paper-tablet	14	97.37	1.84	43.500	1.552	.121
		Tablet-paper	10	94.56	5.61			
	Tablet	Paper-tablet	14	96.67	2.24	68.500	.088	.930
		Tablet-paper	10	94.53	7.66			
Prosodic reading	Paper	Paper-tablet	14	60.00	18.36	65.000	.298	.765
		Tablet-paper	10	56.30	21.56			
	Tablet	Paper-tablet	14	61.86	16.93	60.500	.565	.572
		Tablet-paper	10	58.00	20.14			

The changes in the reading order of the text by students have no effect on the reading speeds with the use of paper and tablet computers; on the accuracy rates of reading with the use of paper and tablet computer; and on prosodic reading skills with the use of paper and tablet computer. This shows that the order in which the text-reading environment is used has no effect on the reading speed, accuracy rates of reading and prosodic reading skills of the students in reading from paper or tablet computers.

13 female students and 11 male students participated in the research. The results of the analysis on whether there is a difference in the students' fluent reading skills according to their gender are displayed in **Table 4**.

Table 4. Students' fluent reading skills according to their gender

Variable	Reading environment	Gender	n	$\bar{X}$	ss	U	Z	p-value
Reading speed	Paper	Female	13	117.92	31.90	51.000	1.188	.235
		Male	11	102.27	25.52			
	Tablet	Female	13	114.38	29.62	65.500	.728	.733
		Male	11	107.45	31.03			
Accuracy rate of reading	Paper	Female	13	96.80	2.60	71.500	.000	1.000
		Male	11	95.49	5.32			
	Tablet	Female	13	97.08	1.58	60.500	.637	.531
		Male	11	94.24	7.37			
Prosodic reading	Paper	Female	13	62.15	17.97	55.500	.945	.361
		Male	11	54.09	20.93			
	Tablet	Female	13	62.77	17.36	61.000	.618	.369
		Male	11	57.27	19.15			

According to the gender of the students, the rate of reading from paper and tablet computer, the accuracy rates of reading from paper and tablet computer, the prosodic reading skills from paper and tablet computer did not differ. This shows that the gender of the students does not affect the reading speed, accuracy rates of reading and prosodic reading skills in their readings from paper or tablet computers.

12 3rd grade students and 12 4th grade students participated in the research. The results of the analysis on whether there is a difference in the students' fluent reading skills according to the class are displayed in **Table 5**.

Table 5. Students' fluent reading skills according to their grade

Variable	Reading environment	Grade	n	$\bar{X}$	ss	U	Z	p-value
Reading speed	Paper	3rd	12	92.75	18.28	21.000	2.944	.002*
		4th	12	128.75	28.17			
	Tablet	3rd	12	94.83	25.15	26.500	2.629	.007*
		4th	12	127.58	25.33			
Accuracy rate of reading	Paper	3rd	12	94.51	5.15	37.000	2.021	.043*
		4th	12	97.89	1.14			
	Tablet	3rd	12	94.63	7.01	61.500	.606	.554
		4th	12	96.92	2.11			
Prosodic reading	Paper	3rd	12	46.83	20.18	21.000	3.001	.002*
		4th	12	70.08	9.16			
	Tablet	3rd	12	49.58	19.60	32.500	2.315	.020*
		4th	12	70.92	6.78			

Note. *p<0.050

While the accuracy rates of reading done by the students from the tablet computer did not differ, reading speeds from paper and tablet computer and the accuracy rates of reading from paper, prosodic reading skills as measured by reading from paper and tablet computer differed significantl according to the grade variable. The results regarding the differences are in favor of 4th grade students. As a result of these findings, it was determined that the 4th grade students read more accurately on paper than the 3rd

grade students, and the 4th grade students did faster and prosodic reading when they read from paper and tablet computers compared to the 3rd grade students.

While 20 of the students participating in the research have a computer and a tablet computer, three of them have a smart phone. The results of the analysis on whether there is a difference in the students' fluent reading skills according to the technological devices they have are displayed in **Table 6**. It was determined that reading speeds from paper and tablet computer, accuracy rates of reading from paper and tablet computer, prosodic reading skills from paper and tablet computer did not differ according to whether the students have a computer, tablet computer or smart phone. This shows that having a computer, tablet computer or smart phone does not have an effect on their reading speed, accuracy rates of reading and prosodic reading skills in reading from paper or tablet computers.

Table 6. Students' fluent reading skills according to the technological devices they have

Variable	Reading environment	Possession of	Grade	n	$\bar{X}$	ss	U	Z	p-value
Reading speed	Paper	Computer	Yes	20	106.90	26.53	24.000	1.239	.241
		Tablet	No	4	130.00	40.95			
	Tablet	Smart phone	Yes	20	110.35	31.02	34.000	.465	.682
		Computer	No	4	112.75	25.06			
		Tablet	Yes	3	107.67	15.53	28.000	.306	.760
		Smart phone	No	21	111.19	31.36			
Accuracy rate of reading	Paper	Computer	Yes	20	110.90	31.16	37.500	.846	.852
		Tablet	No	4	112.75	25.75			
	Tablet	Smart phone	Yes	20	114.50	30.41	24.000	1.240	.241
		Computer	No	4	94.75	22.88			
		Tablet	Yes	3	120.33	7.02	25.000	.568	.570
		Smart phone	No	21	109.90	31.67			
Prosodic reading	Paper	Computer	Yes	20	96.02	4.41	36.000	.310	.757
		Tablet	No	4	97.12	.56			
	Tablet	Smart phone	Yes	20	96.47	4.10	19.000	1.627	.104
		Computer	No	4	94.87	3.92			
		Tablet	Yes	3	97.59	.39	25.000	.567	.570
		Smart phone	No	21	96.00	4.28			

20 students participating in the research have computers. The results of the analysis on whether there is a difference in the students' fluent reading skills according to the period that they have computers are displayed in **Table 7**. It was determined that the speed of reading from paper, accuracy rates of reading from paper, prosodic reading skills from paper and from tablet computer did not differ significantly, while reading speeds from tablet computer and reading accuracy rates from tablete computer differed significantly. The reading speed and accuracy rates of reading from the tablet computer are better for students who have a computer for longer than the other students.

Table 7. Students' fluent reading skills according to the period they have computers

Variable	Reading environment	Duration of computer possession	n	$\bar{X}$	ss	X^2	p-value	Diff.
Reading speed	Paper	Less than one year	4	95.75	27.99	.927	.629	
		One-three years	7	105.86	29.96			
		More than three years	9	112.67	24.58			
	Tablet	Less than one year	4	86.25	23.49	6.769	.034*	1-3
		One-three years	7	106.86	38.02			
		More than three years	9	125.00	21.75			
Accuracy rate of reading	Paper	Less than one year	4	93.14	7.94	2.819	.244	
		One-three years	7	95.32	4.03			
		More than three years	9	97.84	1.41			
	Tablet	Less than one year	4	89.39	10.50	8.054	.018*	1-2
		One-three years	7	96.55	2.68			1-3
		More than three years	9	97.99	1.08			
Prosodic reading	Paper	Less than one year	4	46.25	28.24	2.995	.224	
		One-three years	7	57.14	16.61			
		More than three years	9	66.00	15.45			
	Tablet	Less than one year	4	50.75	25.90	1.505	.471	
		One-three years	7	59.00	17.69			
		More than three years	9	66.33	15.25			

Note. *p<0.050

20 students participating in the research have tablet computers. The results of the analysis on whether there is a difference in the students' fluent reading skills according to the period that they have tablet computers are displayed in **Table 8**. Accuracy rates of reading from paper and prosodic reading skills from paper and the reading speeds from tablet computer, accuracy rates of reading from tablet computer and the measured prosodic reading skills from tablet computer did not differ according to the time students have a tablet computer. However, the reading speeds from paper were found to differ according to it. The reading speed of the students who have a tablet computer for a less time is better than the other students.

Table 8. Students' fluent reading skills according to the period they have tablet computers

Variable	Reading environment	Duration of tablet possession	n	$\overline{\text{X}}$	ss	U	Z	p-value
Reading speed	Paper	Less than one year	9	130.44	31.40	16.000	2.545	.011*
		One year or more	11	93.91	19.45			
	Tablet	Less than one year	9	126.22	33.41	33.000	1.254	.210
		One year or more	11	104.91	25.30			
Accuracy rate of reading	Paper	Less than one year	9	97.61	2.25	31.000	1.406	.160
		One year or more	11	95.53	5.07			
	Tablet	Less than one year	9	96.15	3.05	49.000	.038	.970
		One year or more	11	95.07	7.27			
Prosodic reading	Paper	Less than one year	9	66.00	14.99	28.500	1.631	.103
		One year or more	11	54.45	21.54			
	Tablet	Less than one year	9	67.56	11.65	35.000	1.127	.260
		One year or more	11	56.45	20.63			

Note. *$p<0.050$

DISCUSSION

At the end of the research, it was determined that the number of correct words, accuracy rates of reading and prosodic reading skills of the students did not differ according to paper or screen reading and gender. While the number of words accurately read and prosodic reading abilities of the children vary, favoring the fourth graders in both paper reading and screen reading, the accuracy rates of reading only vary in paper reading. The number of accurate words, reading accuracy rates, and prosodic reading abilities of the students are unaffected by whether they own a computer, tablet, or smartphone. While the number of correct words and accuracy rates of reading of the students differed according to the computer usage time in screen reading, no difference was determined in reading from paper. The duration of having a computer does not affect the prosodic reading skills of the students. While the number of words that students read correctly differ according to the duration they have a tablet computer in paper reading, the accuracy rates of reading and prosodic reading skills do not differ according to it.

When the previous studies conducted in the literature are scrutinized, they are observed to have been carried out to shed light on the impact of reading from paper or screen on fluent reading. Basaran (2014) concluded that the fourth grade students' reading both narrative and informative texts on the screen or on paper does not have a significant effect on their understanding of the text and their reading speed. However, rather of reading narrative texts on a screen, pupils prefer to read them on paper. Dundar and Akcayir (2012) found no statistically significant difference between those that read from paper or tablets in terms of reading comprehension or speed. According to their research, Bastuğ and Keskin (2012) found that the study's participants read more quickly, accurately, and understanding when reading on paper as opposed to a screen. For academic reading and lengthy texts, Foasberg (2014) found that students prefer printed media and in this way they can establish deeper relationships with the text. Kazan and Gokbulut (2021) had one group read a text appropriate to the level of the students from paper and another group from a tablet. At the end of the study, it was determined that the reading speed of the students was low according to the number of words they read in a minute. According to the average number of words that read correctly, students' levels were found to be at the "anxiety level". It was concluded that the prosody mean score of the students participating in the study was low. As a result of the research, no significant difference was found between the group reading on the screen and the group reading on paper. Similarly, no significant difference was found between screen reading and paper reading according to the number of words read correctly. In the study conducted by Bulut and Susar Kirmizi (2021), it was determined that the attitudes of the students towards reading from the screen were positive and above the average. In Ozdemir's (2019) study, it was determined that movement activities with physical activity cards and game consoles improve attention, and studies using game console movement activities and physical activity cards-game console movement activities also improve screen reading. In the study conducted by Batluralkiz (2018), it was determined that the 6th grade students of secondary school have an equal level of reading comprehension achievement on screen and paper. When the previous studies conducted in the field are delved into, it is seen that results in the harmony of this study are obtained as well as different ones. In general, it is thought that the differences in the study group and the different years might cause these results. It is thought that more different results could be achieved through increasing the time to utilize technological tools for students in educational environments.

CONCLUSION

People today make unconscious screen readings as a result of the widespread usage of technology. The skills in this area are also developing unconsciously as a result of these unconsciously performed tasks. The development of screen reading abilities is particularly important given the use of technological tools in educational settings for communication, information acquisition, and instruction, because the development of screen reading skills will provide an effective and efficient education in educational environments where technological tools are used. With this study, the fluent reading skills of primary school students in reading on paper and screen have been evaluated.

In this sense, it is thought that the research will be beneficial in terms of shedding light on future research, the design of educational environments, the use of technological tools in education and the development of educational materials for these technological tools.

Suggestions

In line with the research results, the following are recommended:

1. Since there is no difference between students' reading skills on paper and screen, the use of electronic media in schools can be supported. In this way, besides the convenience to be experienced in accessing and sharing information, printing costs can also be saved.

2. The fact that students' reading skills do not differ according to gender can be evaluated as an indication that there is no inequality of opportunity between male and female students, especially regarding the use of technological tools.

3. Since the increase in the use of technological tools is effective on students' reading skills, the use of technological tools can be supported to improve their reading skills.

REFERENCES

Akyol, H. (2006). *Türkçe ilk okuma yazma öğretimi* [*Turkish primary reading and writing teaching*]. Pegem Academy.

Akyol, H. (2013). *Türkçe öğretim yöntemleri* [*Turkish teaching methods*]. Pegem Academy.

Armut, M., & Turkyilmaz, M. (2017). Ortaokul öğrencilerinin akıcı okuma becerilerinin çeşitli değişkenler açısından incelenmesi [Investigation of fluent reading skills of secondary school students in terms of various variables]. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi* [*Journal of Ahi Evran University Kirsehir Education Faculty*]*, 18*(3), 348-375. https://doi.org/10.29299/kefad.2017.18.3.019

Atesman, E. (1997). Türkçede okunabilirliğin ölçülmesi [Measuring readability in Turkish]. *Dil Dergisi* [*Language Magazine*]*, 58*, 71-74.

Aydemir, Z., & Ozturk, E. (2012). The effects of reading from the screen on the reading motivation levels of elementary 5th graders. *TOJET: The Turkish Online Journal of Educational Technology, 11*(3), 357-365.

Aytac, A. (2017). Prozodi ile okuduğunu anlama arasındaki ilişki [The relationship between prosody and reading comprehension]. *Ana Dili Eğitimi Dergisi* [*Journal of Mother Tongue Education*]*, 5*(2), 102-113. https://doi.org/10.16916/aded.286282

Basaran, M. (2013). Okuduğunu anlamanın bir göstergesi olarak akıcı okuma [Fluent reading as an indicator of reading comprehension]. *Kuram ve Uygulamada Eğitim Bilimleri* [*Educational Sciences in Theory and Practice*]*, 3*(4), 2277-2290. https://doi.org/10.12738/estp.2013.4.1922

Basaran, M. (2014). 4. sınıf seviyesinde ekrandan ve kâğıttan okumanın okuduğunu anlama, okuma hızı ve metne karşı geliştirilen tutum üzerindeki etkisi [The effect of screen and paper reading on reading comprehension, reading speed and attitude towards text at the 4th grade level]. *Uşak Üniversitesi Sosyal Bilimler Dergisi* [*Usak University Journal of Social Sciences*]*, 7*(2), 248-268. https://doi.org/10.12780/UUSBD307

Bastug, M., & Akyol, H. (2013). Akıcı okuma becerilerinin okuduğunu anlamayı yordama düzeyi [Predicting level of reading comprehension by fluent reading skills]. *Kuramsal Eğitim Bilimleri Dergisi* [*Journal of Theoretical Educational Sciences*]*, 5*(4), 394-411.

Bastug, M., & Keskin, H. K. (2012). Okuma becerilerinin okuma ortamı açısından karşılaştırılması: Ekran mı kâğıt mı? [Comparison of reading skills in terms of reading environment: Screen or paper?] *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi* [*Journal of Ataturk University Social Sciences Institute*]*, 16*(3), 73-83.

Batluralkiz, C. (2018). *Basılı ve dijital ortamlarda ortaokul öğrencilerinin okuduğunu anlama becerilerinin karşılaştırılması* [*Comparison of secondary school students' reading comprehension skills in print and digital media*] [Unpublished master's dissertation]. Kutahya Dumlupinar University.

Bodomo, A., Lam, M., & Lee, C (2003). Some students still read books in the 21st century: A study of user preferences for print and electronic libraries. *The Reading Matrix, 3*(3), 34-49.

Bulut, S., & Susar Kirmizi, F. (2021). İlkokul 4. sınıf öğrencilerinin ekrandan okumaya yönelik tutumları [Attitudes of primary school 4th grade students towards screen reading]. *Temel Eğitim Dergisi* [*Journal of Basic Education*]*, 11*, 17-29. https://doi.org/10.52105/temelegitim.11.2

Calet, N., Defior, S., & Palma N. G. (2015). A cross-sectional study of fluency and reading comprehension in Spanish primary school children. *Journal of Research in Reading, 38*(3),272-285. https://doi.org/10.1111/1467-9817.12019

Cayir, A., & Ulusoy, M. (2014). Akıcılığı geliştirme programının ilkokul ikinci sınıf öğrencilerinin okuma ve anlama becerileri üzerindeki etkisi [The effect of fluency development program on reading and comprehension skills of primary school sophomores]. *Cumhuriyet International Journal of Education, 3*(2), 26-43.

Cetinkaya, F. C., Ates, S., & Yildirim, K. (2016). Prozodik okumanın aracılık etkisi: Lise düzeyinde okuduğunu anlama ve akıcı okuma arasındaki ilişkilerin incelenmesi [Mediating effect of prosodic reading: Examining the relationships between high school reading comprehension and fluent reading]. *Turkish Studies, 11*(3), 809-820. https://doi.org/10.7827/TurkishStudies.9339

Chu, H. (2003). Electronic books: Viewpoints from users and potential users. *Library Hi Tech, 21*(3), 340-346. https://doi.org/10.1108/07378830310494526

Clin, E., Woolley, L. W., & Heggie, L. (2009). Prosodic sensitivity and morphological awareness in children's reading. *Journal of Experimental Child Psycholog, 104*, 197-213. https://doi.org/10.1016/j.jecp.2009.05.005

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th Edn.). SAGE.

Dundar, H., & Akcayir, M. (2012). Tablet vs. paper: The effect on learners' reading performance. *International Electronic Journal of Elementary Education, 4*(3), 441-450.

Durukan, E. (2014). Metinlerin okunabilirlik düzeyleri ile öğrencilerin okuma becerileri arasındaki ilişki [The relationship between the readability levels of the texts and the reading skills of the students]. *Ana Dili Eğitimi Dergisi* [*Journal of Mother Tongue Education*]*, 2*(3), 68-76. https://doi.org/10.16916/aded.26659

Foasberg, N. M. (2014). Student reading practices in print and electronic media. *College & Research Libraries, 75*(5), 705-723. https://doi.org/10.5860/crl.75.5.705

Groen, M., A., Veenendaal, N., & Verhoeven, L. (2018). The role of prosody in reading comprehension: Evidence from poor comprehenders. *Journal of Research in Reading, 42*(1), 37-57. https://doi.org/10.1111/1467-9817.12133

Gunes, F. (2000). *Okuma-yazma ve beyin teknolojisi* [*Literacy and brain technology*]. Ocak Publishing.

Gunes, F. (2003). Okuma-yazma öğretiminde cümlenin önemi [The importance of the sentence in literacy teaching]. *Türklük Bilimi Araştırmaları* [*Turkology Studies*]*, 13,* 39-48.

Gunes, F. (2009). Ekran okumada verimlilik [Efficiency in screen reading]. *Kalkınmada Anahtar Verimlilik Gazetesi* [*Key Productivity in Development Journal*]*, 248*, 26-29.

Gunes, F. (2013). *Türkçe öğretimi* [*Turkish teaching*]. Pegem Academy.

Gunes, F. (2016). Kâğıttan ekrana okuma alanındaki gelişmeler [Advances in paper-to-screen reading]. *Bartın Üniversitesi Eğitim Fakültesi Dergisi* [*Bartin University Journal of the Faculty of Education*]*, 5*(1), 1-18. https://doi.org/10.14686/buefad.v5i1.5000155474

Gunter, B. (2005). Electronic books: A survey of users in the UK. *Aslib Proceedings, 57*(6), 513-522. https://doi.org/10.1108/00012530510634244

Isik, A. D. (2019). Teknoloji kullanımının eğitim ortamlarında meydana getirdiği değişimler [Changes caused by the use of technology in educational environments]. In F. Gunes, & A. D. Isik (Eds.), *Araştırma ve öğrenme* [*Research and learning*] (pp. 43-53). Sınırsız Eğitim ve Araştırma Derneği Yayınları [Limitless Education and Research Association Publications].

Karasar, N. (2004). *Bilimsel araştırma yöntemi* [*Scientific research method*]. Nobel Yayın Dağıtım [Nobel Publication Distribution].

Kaya, D., & Yildirim, K. (2016). 4. sınıf öğrencilerinin akıcı okumalarının basit ve çıkarımsal anlama düzeylerine göre değerlendirilmesi [Evaluation of fluent reading of 4th grade students according to their literal and inferential comprehension levels]. *Ana Dili Eğitimi Dergisi* [*Journal of Mother Tongue Education*]*, 4*(3),416-430. https://doi.org/10.16916/aded.96428

Kazan, G., & Gokbulut, B. (2021). Öğrenme güçlüğü olan öğrencilerin ekran ve kâğıttan okuma düzeylerinin belirlenmesi [Determination of screen and paper reading levels of students with learning disabilities]. *Uluslararası Karamanoğlu Mehmetbey Eğitim Araştırmaları Dergisi* [*International Karamanoglu Mehmetbey Journal of Educational Research*]*, 3*(1), 27-34. https://doi.org/10.47770/ukmead.903654

Keskin, H. K. (2012). *Akıcı okuma yöntemlerinin okuma becerileri üzerindeki etkisi* [*The effect of fluent reading methods on reading skills*] [Unpublished doctoral dissertation]. Gazi University.

Keskin, H., Bastug, M., & Akyol, H. (2013). Sesli okuma ve konuşma prozodisi: İlişkisel bir çalışma [Reading aloud and speech prosody: A relational study]. *Mersin Üniversitesi Eğitim Fakültesi Dergisi* [*Journal of Mersin University Faculty of Education*]*, 9*(2), 168-180.

Kim, Y. S., Wagner, R. K., & Foster, E. (2011). Relations among oral reading fluency, silent reading fluency, and reading comprehension: A latent variable study of first-grade readers. *Scientific Studies of Reading, 15*(4), 338-362. https://doi.org/10.1080/10888438.2010.493964

Klauda, S. L., & Guthrie, J. T. (2008). Relations of three compenents of reading fluency to reading comprehension. *Journal of Educational Psychology, 100*(2), 310-321. https://doi.org/10.1037/0022-0663.100.2.310

Li, Q., Morris, M. R., Fourney, A., Larson, K., & Reinecke, K. (2019). The impact of web browser reader views on reading speed and user experience. In *Proceedings of the CHI Conference on Human Factors in Computing Systems*. https://doi.org/10.1145/3290605.3300754

Ozdemir, H. (2019). *10-11 yaş çocuklarda fiziksel etkinlik kartları ve video oyun konsollu hareket etkinliklerinin dikkat, ekran ve kağıt okuma performansı üzerine etkisinin incelenmesi* [*Investigation of the effects of physical activity cards and movement activities with video game consoles on attention, screen and paper reading performance in 10-11 year old children*] [Unpublished master's dissertation]. Marmara University.

Ozturk, E., & Can, I. (2013). İlköğretim 5. sınıf öğrencilerinin elektronik kitap okumaya ilişkin görüşleri [Opinions of primary school 5th grade students on reading e-books]. *Türkiye Sosyal Araştırmalar Dergisi* [*Turkish Journal of Social Research*]*, 171*, 137-153.

Rukanci, F., & Anameric, H. (2003). E-kitap teknolojisi ve kullanımı [E-book technology and use]. *Türk Kütüphaneciliği* [*Turkish Librarianship*]*, 17*(2), 147-166. https://doi.org/10.1501/mitos_ymakale_0000005

Schwaneflugel, P. J., Hamilton, A. M., Wisenbaker, J. M., Kuhn, M. R., & Stahl, S. A. (2004). Becoming a fluent feader: Reading skill and prosodic features in the oral reading of young readers. *Journal of Educational Psychology, 96*(1), 119-129. https://doi.org/10.1037/0022-0663.96.1.119

Sidekli, S. (2010). *İlköğretim 5. sınıf öğrencilerinin okuma ve anlama becerilerini geliştirme* [Developing primary school 5th grade students' reading and comprehension skills] [Unpublished doctoral dissertation]. Gazi University.

Slezak-Swiat, A. M. (2019). Complementarity of reading from paper and screen in the development of critical thinking skills for 21st century literacy. *Theory and Practice of Second Language Acquisition, 5*(2), 75-93. https://doi.org/10.31261/tapsla.7564

Tankersley, K. (2005). *Literacy strategies for grades 4-12, association for supervision and curriculum development*. Association for Supervision and Curriculum Development.

Ulu, M. (2016). İlkokul 4. sınıf öğrencilerinin akıcı okuma, basit anlama ve çıkarımsal anlama düzeylerinin problem çözme başarısına etkilerini açıklayan bir yapısal eşitlik modeli [A structural equation model explaining the effects of fluent reading, literal comprehension, and inferential comprehension levels of primary school 4th grade students on problem solving success]. *Eğitim ve Bilim* [*Education and Science*]*, 186*, 93-117. https://doi.org/10.15390/EB.2016.6303

Veenendaal, N. J., Groen, M. A., & Verhoeven, L. (2016). The contribution of segmental and suprasegmental phonology to reading comprehension. *Reading Research Quarterly, 51*(1),55-66. https://doi.org/10.1002/rrq.127

Whalley, K., & Hansen, J. (2006). The role of prosodic sensitivity in children's reading development. *Journal of Research in Reading, 29*(3), 288-303. https://doi.org/10.1111/j.1467-9817.2006.00309.x

Wolters, A. P., Kim Y.-S. G., & Szura, J. W. (2020). Is reading prosody related to reading comprehension? A meta-analysis. *Scientific Studies of Reading, 26*(1), 1-20. https://doi.org/10.1080/10888438.2020.1850733

Yildirim, K. (2013). Fluency-based reading skills and their relations with reading comprehension of elementary school children. *International Journal of Academic Research, 5*, 134-139. https://doi.org/10.7813/2075-4124.2013/5-2/B.20

Yildirim, K., & Ates, S. (2012). Silent and oral reading fluency: Which one is the best predictor of reading comprehension of Turkish elementary students? *International Journal on New Trends in Education and Their Implications, 3*, 79-91.

Yildiz, M., Yildirim, K., Ates, S., Fitzgerald, S., Rasinski, T., & Zimmerman, B. (2014). Components skills underlying reading fluency and their relations with reading comprehension in fifth-grade Turkish students. *International Journal of School & Educational Psychology, 2*, 35-44. https://doi.org/10.1080/21683603.2013.854187

Yilmaz, K., & Horzum, M. B. (2005). Küreselleşme, bilgi teknolojileri ve üniversite [Globalization, information technologies and university]. *İnönü Üniversitesi Eğitim Fakültesi Dergisi* [*Journal of Inonu University Faculty of Education*]*, 6*(10), 103-121.

Yusthi, E. (2014). Teaching reading comprehension in recount text by using zooming in and zooming out (ZIZO) strategy grade students of SMP Sriguna Palembang. *Journal Edukasi Pendidikan dan Pengajaran* [*Journal of Educational Education and Teaching*]*, 2*(2), 132-146.