Comparison of Printed and Digital Text Reading Miscues of Third Grade Primary School Students

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Abstract

In this study, the printed and digital text reading process of third grade primary school students was examined comparatively. In the study, a descriptive survey model was used to compare third grade primary school students' printed and digital text reading miscues. The study group of the research consisted of 6 third grade students studying in primary schools in the centre of Konya. A narrative reading text, which was selected after the validity and reliability studies had been carried out, was used as the data collection tool. The 'Reading Miscue Inventory' developed by Goodman, Watson and Burke (2005) was used in the analysis of the data. According to the data obtained as a result of the research, students were generally able to use linguistic cues more selectively and flexibly in digital text reading. Although similar results were obtained in both text types in terms of similarity in reading speed and letter-sound relationship, the sound similarity of the students was higher in digital text reading than in printed text reading. According to another result obtained in the research, students made fewer reading miscues in digital text reading than in printed text reading. When examining the retelling scores, digital text reading scores were higher than for printed text reading.

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Introduction

The Turkish curriculum is shaped around four learning domains: reading, writing, listening and speaking. Among these learning domains, reading has a very important place not only academically from the first level onwards, but also in the social and cultural field. Examined in general terms, reading is a wide learning domain that encompasses many mental processes such as analysis, synthesis, evaluation, criticism, and interpretation through recognition of the meanings of words and sentences, starting with recognition of sounds.

Reading, which is a skill that enriches one's imagination, nurtures one's creativity and expands one's horizons by improving one's vocabulary (Akyol, 2021), is a challenging process that does not only consist of decoding letters (Topuzkanamış & Maltepe, 2010). Reading more clearly is a dynamic meaning-making process that necessitates active and effective communication between the author and the reader (Akyol, 2021). In the process of constructing meaning, the reader uses three types of information systems: sampling, guessing, and validation. These three information systems are the letter-sound relationship, and syntactic and semantic cues. The letter-sound relationship expresses the complex relationship and connection between spelling rules, punctuation marks, etc. and the sounds of the spoken language, while syntactic cues reveal the relationship between words and sentences in a text. Semantic cues explain how readers make sense of texts (Goodman, 1996; Goodman, Watson, & Burke, 2005). Similarly, Moore and Brantingham (2003) also stated that readers use a combination of semantic, syntactic and letter-sound relation information systems to give meaning to the text. The most effective way to determine how students use these items is to examine reading miscue made during reading. (Girgin, 2006; Goodman, 1995; Gunning, 2003).

Reading miscues include many types of miscues made by the reader during reading, such as replacing the word in the text with another word, not reading a word in the text, or adding a word that is not in the text (Davenport, 2002). Addition, omission, repetition, and changing the place of words or letters can be stated as the main reading miscues (Goodman, 1995; Leslie & Caldwell, 2006; McKenna & Stahl, 2003; Temple, Crawford, & Gillet, 2009; Woods & Moe, 1989; 2007). The determination and correction of reading miscues is important at primary school level, because when reading miscues are not corrected, students cannot achieve academic success (Bilge & Sağır, 2017). In determining the reading miscues that are made, the miscues are recorded and then miscue analysis is made.

With miscue analysis, it is possible to identify, define and evaluate the reader. In other words, through miscue analysis, the reader's strengths and the strategies he/she uses to understand what he/she reads can be identified (Davenport, 2002). As an evaluation tool, miscue analysis provides qualitative and quantitative data on reading. Qualitative data obtained in miscue analysis explain what the reader is doing while reading, while quantitative data include the frequency or number of miscues (Goodman et al., 2005). Another purpose of miscue analysis is to include certain information about the reader's reading ability, grammar and strategy use (Davenport, 2002; Goodman et al., 2005).

Miscue analysis was first developed by Kenneth Goodman (Moore and Gilles, 2005) and 'Reading Miscue Analysis' was recognised as a valid research and evaluation tool by the National Reading Panel Report (2000) (Theurer, 2002). The purpose of reading miscue analysis is to determine whether the miscues made by students during reading are random or a conscious act that they use to understand the text. In this way, through miscue analysis, teachers obtain information about students' semantic, syntactic and grapho-phonic miscues. Indeed, Goodman and Burke (1972) believe that miscues made in the reading process are not random errors, but that rather, they are cued by the interaction between thought and language in the reader during the processing of mostly written material (Wixson, 1979).

According to Goodman, there are two main types of miscue analysis: unrecorded and recorded processes. The process of recorded reading miscue analysis is a formal assessment that is suitable for the researcher or teacher and provides detailed information about the reader's or student's reading, while the process of unrecorded miscue analysis enables a formative assessment that is appropriate for the student's success during reading (Janan, 2011). Within the scope of the recorded reading miscue analysis process, the reading materials are selected by the researcher or teacher, while in the

unrecorded miscue analysis process, the student him/herself chooses the materials. In both miscue analysis processes, a coding form is used to assist the miscue analysis, and the student's reading is evaluated by marking on this form the reading miscues made by the student during reading.

On the other hand, developments occurring in digital technology have had an impact on reading just as they have in all areas of life; new terms such as screen reading, digital reading, reading from a computer or reading from a portable/mobile device have begun to be referred to (Güneş, 2009). Although there is variation regarding terminology, it is possible to define digital reading in general terms as a dynamic meaning-making process that functions with the aid of basic technology usage information based on the stimuli on the screen (Keskin, Baştuğ, & Atmaca, 2016). When digital text and printed text are compared as a format, many aspects such as time spent on reading, text reading method, sensitivity to the text, the scan-and-find method for what is read/is to be read, orientation, content diversity and selectivity draw attention as differences that emerge between digital and traditional reading acts (Liu, 2005; cited in Odabaş, 2017). In digital reading, the pages are in portrait orientation, while in traditional reading in print, the pages are in landscape orientation. When digital and printed text are compared in terms of the reading process, some differences and difficulties can be experienced due to these two opposite movements followed by the eye (Güneş, 2009). Research on the subject gives an idea about readers' adaptation to reading printed and digital texts. In a study by Weisberg (2011) comparing traditional reading with digital reading, it was concluded that participants were more willing to read digitally. On the other hand, Hamer and McGrath (2010) concluded in their research that while students could focus more easily on the text they read in the digital environment, their rate of recall related to printed text was higher. In addition, it was observed that the majority of students preferred printed text to digital text. Therefore, it is possible to say that the digital or printed text preferences of readers vary depending on a number of sub-reasons.

The effect of the digital age on reading has also had its effect in schools; with advances such as the widespread use of smart boards and the practice of tablet distribution to every student throughout the country, printed books have begun to be replaced by books prepared in the digital environment (eokul-meb.com, 2013). These books are created and used in schools by preserving the content of the textbooks approved by the Ministry of National Education Head Council of Education and Morality and transferring them to digital media (Tiryaki & Karakuş, 2019). As a result of the technology that we use effectively in every aspect of our lives, digital reading has become an inescapable reality for both students and readers. However, a number of studies have shown that digital reading is more difficult and that readers cannot demonstrate sufficient success in digital reading (Güneş, 2010; Kerr, 2002; Kurniawan & Zaphiris, 2001; O'Hara & Sellen, 1997). This situation necessitates re-examination of digital reading.

When we look at the studies in the literature in which digital and printed text reading are examined comparatively, it is seen that the subject is shaped around reading skills (Baştuğ & Keskin, 2013; Kuru, Kaşkaya & Calp, 2017; Kuru, 2018), student attitudes (Başaran, 2014) and reading comprehension (Ercan & Ateş, 2015). Therefore, since such a study has not previously been made in the literature, in this study, printed and digital text readings are comparatively examined according to the Goodman miscue analysis inventory. When analysing miscues in the Goodman miscue analysis inventory, syntactic acceptability, semantic acceptability, meaning change, correction, the letter-sound relationship and sound similarity are focused on. In the form, the reading evaluation is made by answering the questions of acceptability of the miscues made, the extent to which they resemble the expression in the text in letter-sound relationship terms, whether they lead to a change in meaning, and whether they are corrected or not. The questions in which these criteria in the inventory are evaluated are framed in such a way that the interaction of all language cueing systems and reading strategies is taken into account. In this sense, this research is important in terms of contributing to the relevant subject area.

Accordingly, the aim of this study is to analyse the printed and digital text reading processes of third grade primary school students. In line with the purpose of the research, the sub-problems have been designed as follows:

Do the printed and digital text reading results of each student in the study group of the research differ in terms of:
1. Flexible and selective use of linguistic cues?
2. Dependences on the surface features of the text?
3. The number of miscues?
4. Retelling scores?

Method

This research is a descriptive study based on the survey model. The survey model is a research approach that aims to describe and explain past and current situations, events, groups, objects and characteristics in their natural state (Ekiz, 2003; Karasar, 2006). Therefore, in this study, which aimed to comparatively examine the printed and digital text reading miscues of third grade primary school students, the survey model was used. With the research conducted on the group with the descriptive survey, an attempt was made to examine and describe the reading status of the individuals in the group depending on the reading tools used.

Study Group

While determining the study group of the research, the convenience sampling method, which is one of the purposive sampling methods (Yıldırım & Şimşek, 2016), was adopted in order to ensure proximity and access easiness. In this context, six students attending the third grade in an official primary school in the Selçuklu District of Konya Province in the 2020-2021 academic year comprise the study group of the research. The criterion used in the selection of the students was determined as "students who do not have reading problems (instructional level)" in line with the opinions received from primary school teachers, observations of sample text reading, and evaluation results. Since the aim was to compare the language cueing systems and reading strategies used by the students depending on the reading tools, the frustration level and independent level were eliminated and students at the instructional level were determined as the study group. The main criterion in the selection of the participants was that they were included in the instructional level according to the "Miscue Analysis Inventory". During the determination of this criterion, opinions were obtained from primary school teachers who were teaching in the third grade and from a faculty member as a field expert. While determining the study group, attention was paid to the appropriateness of the text to be taught for the grade level in terms of the number and type of words.

As a result of the data obtained, the study group was determined. The students forming the study group were coded as S1, S2, S3, S4, S5 and S6. Descriptive statistics of the study group are given in Table 1.

Table 1. Descriptive Statistics of Study Group

Gender	f	%	Student Codes
Female	4	66.6	S2,S3,S4,S6
Male	2	33.3	S1,S5
Age			
8	2	33.3	S2,S5
9	4	66.6	S1,S3,S4,S6
Number of Book Pages Read Daily			
0-20 pages	1	16.6	S4
21-40 pages	2	33.3	S3, S2
41-100 pages	3	50.0	S1,S6,S5
Digital Text Reading Frequency			
Never	1	16.6	S5
Sometimes	4	66.6	S1,S2,S4,S6
Frequently	1	16.6	S3
Total	6	100	S1,S2,S3,S4,S5,S6

Data Collection Tool

In this study, the reading text named "The Merchant's End" from Gönül Publications' "Educational Tales" series, which was included as a recommended work with the decision of the Ministry of National Education the Head Council of Education and Morality, was used as the data collection tool. The reason why the same text was read in printed and digital reading was to control the factors that affect the student's reading performance, such as readability, motivation, and attitude towards the text, and during the research process, to re-evaluate the letter-sound relationship, syntactic and semantic relationships that are expected to be established in the text. While selecting the text, first of all, attention was paid to the fact that the students had not read the text before, and also, the readability level of the text was measured to check its appropriateness. For this purpose, Ateşman's formula, which was developed to determine the readability level, was used (Figure 1).

$$\text{Ateşman Index} = 198.25 - \left(40.174 \times \frac{\text{Total Syllables}}{\text{Total Words}}\right) - \left(2.610 \times \frac{\text{Total Words}}{\text{Total Sentences}}\right)$$

Average word length based on syllables   Average sentence length based on words

Figure 1. Ateşman's Formula (Ateşman, 1997)

In the evaluation of the obtained data, the rating proposed by Ateşman was also used (Table 2).

Table 2. Readability Rating

Level	Readability Number
Very easy	90-100
Easy	70-89
Medium difficulty	50-69
Difficult	30-49
Very difficult	1-29

According to this formula and evaluation criteria, the readability level of the text used in the study is as follows:

The Merchant's End = 622 words - 1536 syllables - 116 sentences

Word length = Number of syllables ∕ Number of words

Sentence length = Number of words ∕ Number of sentences

Word length = 1536 ∕ 622 = 2.46945

Sentence length = 622 ∕ 116 = 5.36207

Ateşman's formula = 198.825 – 40.175 ×A – 2.610 ×B

$\qquad$ = 198.825-(40.175×2.46945)-(2.610×5.36207)

$\qquad$ = 198.825-99.21015-13.995

$\qquad$ = 85.61985 = Easy level

Considering Zorbaz's (2007) idea that in the selection of a text, its qualitative characteristics should be considered besides its readability measurements, in this study, attention was paid to the completeness of the story chapters of the text to be read, and to the fact that it had an interesting and high quality printing.

According to Durukan (2014), students' reading speed and reading comprehension success are naturally higher in texts with a high readability level. In other words, it was decided to choose a text which had an easy readability level, since students' success in reading is affected by whether the readability level of the text is appropriate for their grade level.

In the first stage of the implementation, accompanied by the researcher, the same text was read directly from the printed book, while in the second stage, the same text was read on a 15.6-inch horizontal laptop computer screen. The digitally read text was prepared in the same page image and font size, in accordance with the exact printing of the book. The time periods for reading the printed and digital texts were set three months apart, taking into account the average forgetting time of the text by the students. In fact, as Garvin (1991; as cited in Alford & Brock, 2012) mentioned, and as visualised in Edgar Dale's (1969) Cone of Experience, the human brain can remember 10% of what it reads after a period of approximately two weeks (Hartog, Mulder, & Hoetjes, 2014). Therefore, the three-month period between the two readings was considered sufficient for this study.

Before the implementation of the research, the necessary permission was obtained from the Konya Provincial Directorate of National Education, and Parental Consent Forms were signed for each student (File No: E-83688308-605.99-22065258). During the implementation process, audio recordings were taken for both readings, again with the permission of the participants. Afterwards, the students' reading times were noted by listening to the recordings, and the oral reading miscues were first marked on the printed material for each student, and then arranged be entering them in the "Miscue Analysis Inventory". The steps followed in the data collection process were carried out for each student individually.

In the process of validity and reliability studies in the research, inter-researcher reliability was examined for four sections, aimed at: a) the readability level of the text, b) whether the implementation was carried out as planned, c) evaluation of the reading scores, and d) observation of the reading miscues. Simple percentages were used while evaluating the readers' miscues marked by both researchers. The percentage of consensus in the study was calculated by adding the number of miscues marked in the same way by both researchers and dividing this number by the total number of miscues marked by the two researchers. The rate of agreement between the miscues marked by both researchers was 88%; for differences of opinion, they came together and reached a compromise.

Data Analysis

In the research, the data were analysed with the descriptive analysis technique using the Goodman Miscue Analysis Inventory. The miscue analysis inventory reveals the strategies used by students while reading, by analysing the miscues made by the student in the way that they are recorded on the miscue record forms (Vaccaro, 2012).

Goodman Miscue Analysis Inventory: This was developed and used by Goodman et al. (1987, 2005) as a scoring form for recording and classifying oral reading miscues, similar to other inventories for miscue analysis. In this form, all readings that are different from what is written in the text are considered miscues; dialectal differences in pronunciation are not considered to be miscues. However, a repeated miscue of the same word is not considered to be a single miscue as long as the function of the word remains the same (Warde, 2005).

The miscue analysis scoring form consists of 8 columns. These are:
1. Syntactic acceptability
2. Semantic acceptability
3. Meaning change
4. Correction
5. Semantic structure
6. Grammatical relationship
7. Letter-sound relationship
8. Sound similarity

While scoring the reader in the miscue analysis scoring form, the first four columns are marked as 'yes', 'partially' and 'no'. Semantic structure is evaluated according to the scorings in the semantic acceptability, meaning change and correction columns. Grammatical relationship is evaluated according to the scorings in the syntactic acceptability, semantic acceptability and correction columns. The letter-sound relationship and sound similarity columns are marked as 'high' (high degree of similarity between the incorrectly read word and the correct word in the text), 'partial'

(partial similarity between the incorrectly read word and the correct word in the text), and 'none' (no similarity between the incorrectly read word and the correct word in the text).

During the sound recording of the reading, the students participated in the environment individually; the researcher and the student were side by side. The researcher gave general information to the students about the reading process and clearly stated what was expected from them at the beginning of the study. Before the reading, the researcher reminded the students that they were to relate what they had read and answer the questions (*Dear ...., thank you for reading. You have finished the whole text. Now could you close the book and tell me what you remember about the text?*) During the oral reading sessions, the participants were not interrupted in any way. The researcher noted the reading miscues on the printed text, of which she had a copy.
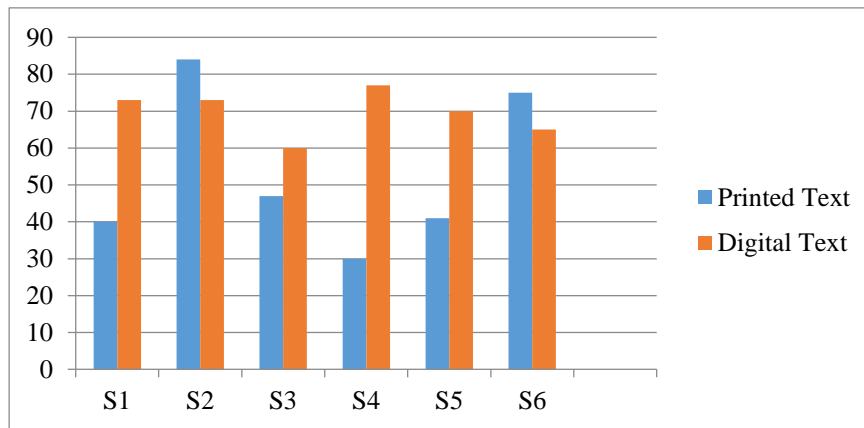
The researcher's printed text was prepared in the font of the original text, and the paragraph breaks were double-spaced in order to note the miscues clearly. Then each miscue was marked on the miscue analysis coding form, and in order to verify and review the recorded oral readings, and to ensure consensus, the recordings were also listened to several times by an expert researcher. While evaluating the retelling, by considering the ordering of the characters according to their importance, forty points out of a hundred points were given, while a total of sixty points were given to the main events and the details supporting the main events, which were also scored according to their importance.

Findings

As the first sub-problem of the research, the results for the students' readings of the printed and digital texts were compared in terms of their flexible and selective use of linguistic cues. Percentages for semantic structure and building a grammatical relationship in reading miscues give information about the flexible and selective use of language. In the miscue analysis scoring form, miscues with a semantic acceptability of 'yes' or 'partially' in the semantic structure column and with a syntactic acceptability of 'yes' or 'partially' in the grammatical relationship column with miscues that the student has corrected, determine the student's flexible and selective use of linguistic cues. The fact that these miscues made by the students are without loss or only partial losses, and that the percentage of semantic structure is strong, partially strong or needs correction, are the percentages for using linguistic cues flexibly and selectively. Based on this, the findings regarding the differences in the flexible and selective use of linguistic cues for the printed and digital text reading results of the third grade primary school students are given in Table 3.

Table 3. Percentages for Selective and Flexible Use of Linguistic Cues

	Selective and Flexible Use of Linguistic Cues			
	Semantic Structure (%)		Grammatical Relationship (%)	
Participants	Printed Text	Digital Text	Printed Text	Digital Text
S1	40	73	60	73
S2	84	73	83	64
S3	47	60	53	60
S4	30	77	40	100
S5	41	70	46	70
S6	75	65	62	65

Figure 2. Semantic Structure Percentages

When the students' readings of printed and digital texts are compared in terms of semantic structure percentages, it is seen that S1 (73%>40%), S3 (60%>47%), S4 (77%>30%) and S5 (70%>41%) performed semantic structuring at a higher level in digital text reading, while S2 (73%<84%) and S6 (65%<75%) had higher percentages in printed text reading.
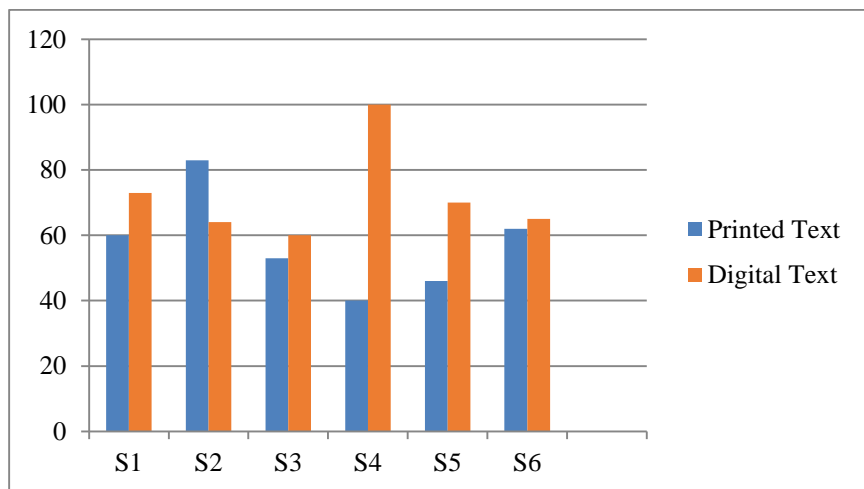
**Figure 3.** Grammatical Relationship Percentages

When the students' printed and digital text readings are compared in terms of establishing a grammatical relationship, it is seen that S4 (40%<100%), S5 (46%<70%), S1 (60%<73%), S3 (53%<60%) and S6 (62%<65%) were able to establish stronger grammatical relationships in digital text reading, while S2 (83%>64%) established a weaker grammatical relationship in digital text reading.

As the second sub-problem of the research, the results for the students' readings of the printed and digital texts were compared in terms of their dependences on the surface features of the text. Students' reading speed and the words, letter-sound relationship and sound similarities in their reading miscues provide information about their dependences on the surface features of the text. Students' dependences on the surface features of the text while reading were evaluated by examining the letter-sound relationship and sound similarity columns for their reading miscues. When examining the miscues made while reading the text, the fact that the miscue is syntactically and semantically acceptable, that it provides the meaning in the sentence, or that the miscue is corrected even though the meaning is partially changed shows that the student pays attention to the semantic structure. Therefore, in the miscues that do not provide the meaning, but where the letter-sound relationship and sound similarity are high, the result is that the students adhere to the surface features of the text. Table 4 shows the findings regarding the differences between the printed and digital text reading results in terms of the students' dependences on the surface features of the text.

Table 4. Percentages for Dependences on the Surface Features of the Text

|	Dependences on Surface Features of Text					
	Reading Speed (sec)		Letter-Sound Relationship (%)		Sound Similarity (%)	
Participants	Printed Text	Digital Text	Printed Text	Digital Text	Printed Text	Digital Text
S1	463	440	93	100	93	100
S2	352	344	100	100	100	100
S3	556	486	100	100	100	100
S4	316	326	100	100	90	100
S5	341	363	100	100	100	100
S6	363	365	90	90	95	100
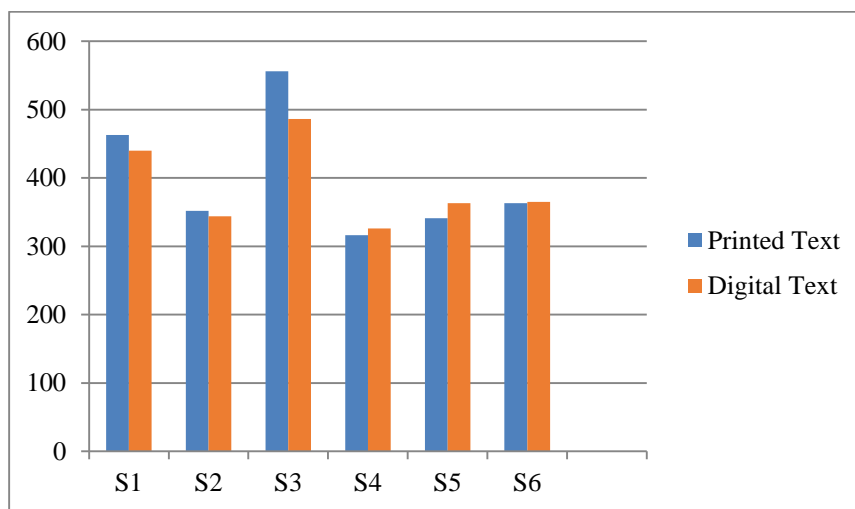
Figure 4. Reading Speeds

When the students' printed and digital text reading speeds are compared, it is seen that the printed and digital text reading speeds of S1 (463>440), S2 (352>344), S4 (316<326), S5 (341<363) and S6 (363<365) are in periods close to each other. S3 (556>486), on the other hand, completed the reading of the digital text in a shorter time than that of the printed text.
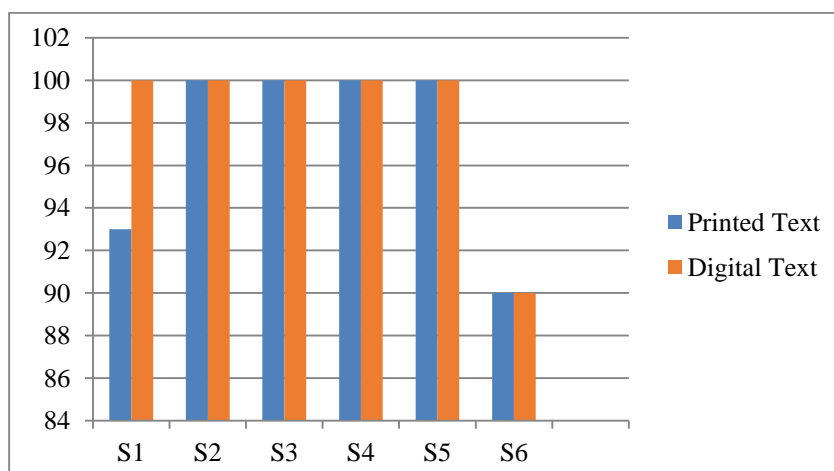
Figure 5. Letter-Sound Relationships

When the results are examined in terms of the letter-sound relationship, S2, S3, S4 and S5 made letter-sound relationships with a rate of 100%, while S6 made a letter-sound relationship with a rate of 90% in both printed and digital text readings. Unlike these students, S1(93%<100%) made

miscues showing a higher letter-sound relationship in digital text reading compared to printed text reading.
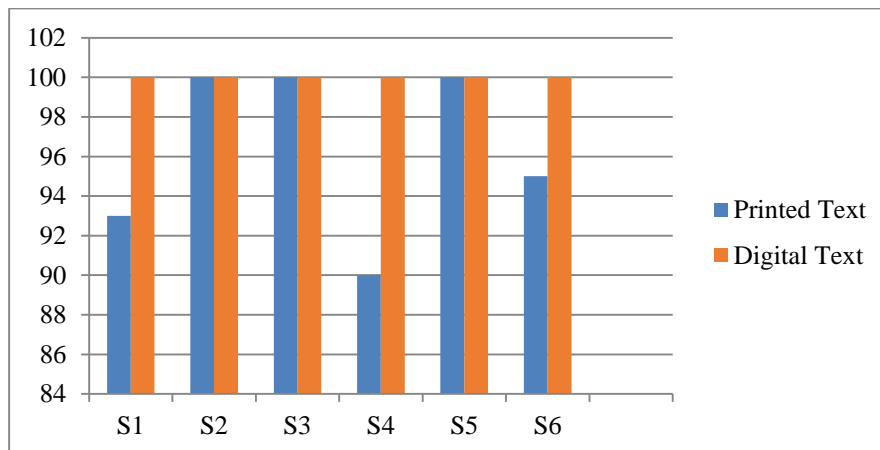
Figure 6. Sound Similarity Percentages

According to the results of the sound similarity in the students' miscues, S2, S3 and S5 made miscues that showed 100% sound similarity in both printed and digital text readings. S1, S4 and S6 made miscues that showed 100% sound similarity in their digital text readings, while in their printed text readings, miscues showing 93%, 90% and 95% sound similarity were made, respectively.

As the third sub-problem of the research, the printed and digital text reading results of the students were compared in terms of the number of miscues. The findings regarding the number of miscues in students' reading of printed and digital texts are given in Table 5.

Table 5. Number of Miscues

|	Number of Miscues	
Participants	Printed Text	Digital Text
S1	2	1
S2	2	1
S3	3	1
S4	2	1
S5	4	2
S6	4	2
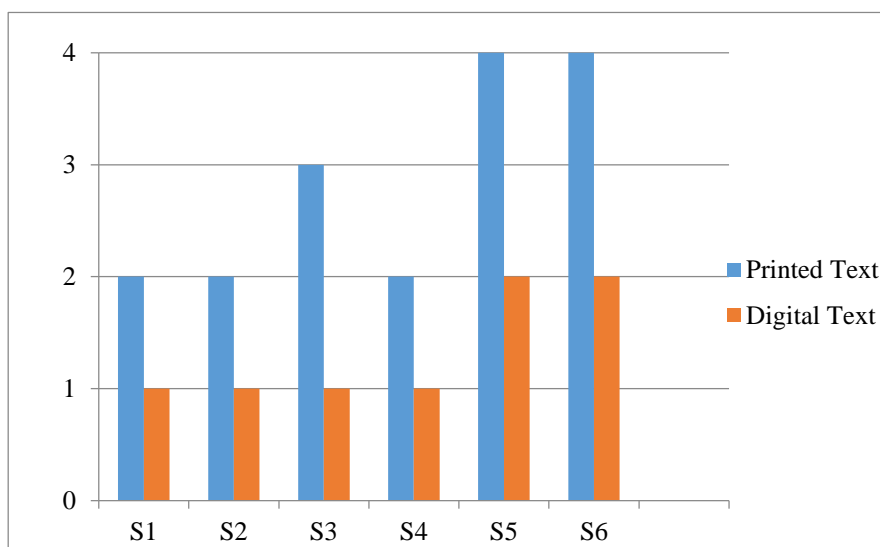
Figure 7. Number of Miscues

When the number of miscues made by the students is examined, it is seen that all students made fewer miscues in reading the digital text compared to the printed text. While the highest number of miscues in printed text reading belonged to S5 and T6, the lowest number of miscues belonged to S1, S2 and T4. In their digital text readings, S5 and S6 made the most miscues, while T1, T2, T3 and T4 made the fewest miscues.

As the fourth sub-problem of the research, the students' results for reading printed and digital texts were compared in terms of retelling scores. The retelling scores obtained by the students after reading provide information on whether or not they had understood the text they read. The fact that the students' mention the basic structure of the text, that they include important information in their narration, and that their narration is sequential, unabridged and complete are the main points considered in the evaluation. In narrative text retelling, the total percentage is calculated by scoring the characters 40% and the events 60% (Goodman, Watson, & Burke, 2005). Data on students' retelling scores are given in Table 6.

Table 6. Retelling Scores

Participants	Retelling Scores	
	Printed Text	Digital Text
S1	80	85
S2	65	70
S3	85	85
S4	65	70
S5	60	65
S6	75	75
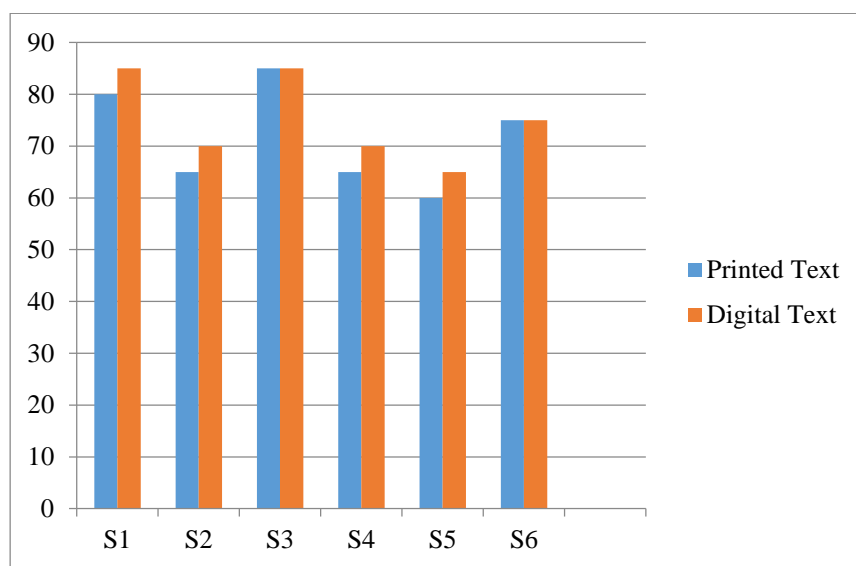
Figure 8: Retelling Scores

According to the results for the students' retelling scores after reading, S1 (80<85), S2 (65<70), S4 (65<70) and S5 (60<65) obtained higher scores in digital text reading, while S3 (85=85) and S6 (75=75) obtained the same retelling scores in both printed and digital text readings.

Discussion, Conclusion and Recommendations

This study was carried out to compare the printed and digital text reading miscues of primary school third grade students.

According to the results obtained in the study, the majority of students were able to use linguistic cues more selectively and flexibly in their digital text reading. It would be useful to give examples from students' readings for a clearer understanding of the results. In his printed text reading,

student S1 read the word *'tutmuş'* as *'tutumuş'* in the sentence 'Neşeli bir şekilde evinin yolunu *tutmuş'* (He made his way home happily). It was concluded that S1 could not form the semantic structure and establish a grammatical relationship, since the word he read was not acceptable either syntactically or semantically and he failed to correct his miscue. It is seen that the student could not use the linguistic cues selectively and flexibly while reading the printed text. While reading the digital text, the same student read the sentence 'Patronum bana *hizmetlerimin* karşılığında üç kuruş verdi' as 'Patronum bana *hizmetlerim* karşılığında üç kuruş verdi' (My boss gave me three kurus for my services). In this example taken from the form, it is seen that the miscue was syntactically and semantically acceptable; the student was able to establish the grammatical relationship and semantic structure. Therefore, it can be said that S1 used the linguistic cues more selectively and flexibly in digital text reading than in printed text reading. In another example, it was seen that in using the linguistic cues selectively and flexibly, S4's reading of the printed text was more successful than her reading of the digital text. S4 made a partially acceptable syntactic and semantic miscue by reading the word *'veririm'* as *'vereyim'* in the sentence 'Şu ağaçtaki kuşu vurursan sana iki altın *veririm'* (If you shoot the bird in that tree, I will give you two gold coins) in the printed text reading; she partially established the semantic structure and albeit weakly, formed the grammatical relationship. Therefore, it can be said that S4 used the linguistic cues selectively and flexibly. In her digital text reading, the same student made a syntactically acceptable but semantically unacceptable miscue, as she read the word *'çalıyor'* (playing) in the sentence 'Köylü durmadan *çalıyor*' (The villager is playing nonstop) as *'çalışıyor'* (working). While this miscue of the student caused a loss in the semantic structure, it was seen that she partially established the grammatical relationship, and that she obtained a high percentage in the letter-sound relationship and sound similarity. Due to these and similar miscues that the student made in digital text reading, it can be said that she was unable to use the linguistic cues at a good level.

According to another result obtained in the research, students' dependences on the surface features of the text were examined in terms of reading speed, letter-sound relationship and sound similarity in reading the printed and digital texts. With regard to reading speed, it was observed that except for S3, the students' reading speeds for printed and digital texts were close to each other. This result is in parallel with the result of the study conducted by Dündar and Akçayır (2012). On the other hand, S3's digital text reading speed was higher than her printed text reading speed. Considering the demographic information, this result can be interpreted as that S3 was more used to digital reading because she frequently read digitally, and so she lost less time during screen flows compared to when reading from a book. When we look at the results for the letter-sound relationship, it was seen that except for S1, the students had close to 100% similarity in both types of reading. On the other hand, S1 formed the letter-sound relationship at a higher rate in digital text reading than in printed text reading. Finally, according to the sound similarity percentages in the students' miscues, all students made miscues in digital text reading that showed 100% sound similarity. This result reveals that in digital reading, the students made great use of sound cues in their miscues, in other words, that they adhered strongly to the surface features of the text. For example, S6 read the word *"suçlamalarını"* as *"suçlamaları"* in the sentence 'Tüccar *suçlamalarını* tekrarlamış' (The merchant repeated his accusations) in the printed text reading. Similarly, in the digital text reading, she read the word *'amacı'* (aim) as *'ama'* (but) in the sentence '*Amacı* para vermemekmiş' (His aim was not to give money). Due to these and similar reading miscues, it can be said that S6 established a high level of sound similarity, and thus adhered to the surface features of the text.

In the research, the number of miscues made by the students in reading printed and digital texts was examined comparatively. According to the results, all students made fewer miscues in digital text reading than in printed text reading. As an example of the data obtained, in both readings, S1 repeated the same punctuation miscue by reading *'demiş cüce de'* (said the dwarf also) as *'demiş. Cüce de"* (said. The dwarf also). It is seen that the student, who did not realise that he had caused a meaning change in both of his miscues, did not focus on the meaning. Similarly, in both readings, S3 repeated either the first word in the sentence or the first syllable of words. In addition, she mostly made miscues in the suffixes at the end of words. For example, when reading the printed text, she read the word *'ağaçta'* (in the tree) as *'ağaçtaki'* (the one in the tree), while in the digital text reading, she read the word *'bunu'* (accusative this) as *'buna'* (to/for this). Looking at the literature, the results obtained in

studies comparing readers' success in printed and digital text reading are mostly in favour of printed text (Dillon, 1992; Kurniawan & Zaphiris, 2001; Muter & Maurutto, 1991; Noyes & Garland, 2008; Baştuğ & Keskin, 2013). In these studies, in general, readers' reading speeds, correct reading levels, and reading comprehension were compared. On the other hand, some studies reveal that reading e-books, or in other words, digital text reading has positive effects on students' reading. In their research, López-Escribano, Valverde-Montesino and García-Ortega (2021) examined young children's e-book reading in comparison with their printed book reading. As a result of the research, it was seen that reading e-books was more effective in children's literacy. In the study conducted by Yıldız and Keskin (2016), it was seen that adolescent students developed more positive attitudes towards digital reading.

Finally, in the research, the students' retelling scores, that is, their narrations of the text in their own sentences after reading the text, were examined. According to the obtained results, students' digital text retelling scores were higher than their printed text retelling scores. For example, while S4 scored twenty-five out of forty for the characters and forty out of sixty for the sequence of events for retelling scoring of the narration of the printed text reading, she increased her retelling score by 5 points in the narration of the digital text reading because she fully described the cycle of events and was able to express the main idea at the end of the text. Another participant, S5, listed the cycle of events without specifying the characters' personality traits in the printed text narration. In the digital text narration, it was seen that he understood the main characters because he emphasised the good-heartedness of the villager and the cunning of the merchant, and she obtained five points more than in the printed text narration. The student never used the expression 'he said' in the dialogue passages and acted out the events by voicing the characters. S6, on the other hand, obtained forty points out of forty for the characters in both text-reading narrations because she was able to show that she fully understood the character analyses, and fifty points out of sixty for the sequence of events because she related the events partially sequentially and in full, and obtained a total of ninety points. Considering the studies on reading comprehension in digital reading and printed text reading, it is seen that in parallel with the results obtained in this research, there are studies in favour of digital text reading. In the study conducted by Greenlee-Moore and Smith (1996), one group of students simultaneously read from digital texts and the other group from printed texts. As a result of the study, it was found that in the texts that were difficult to relate and contained a lot of information, the reading comprehension levels of the students who read in the digital environment were higher. In another study, İleri (2011) examined fifth grade students' reading comprehension levels according to text types in screen reading. As a result of the study, it was seen that the reading comprehension levels of students who performed screen reading in the informative text type were higher than those of the students who carried out printed reading. Similarly, in the study conducted by Duran and Alevli (2014), the effect of screen reading on comprehension in eighth grade students was investigated. The students read some of the specified texts from the printed text and some of them on the digital screen. As a result of the study, it was seen that comprehension scores were higher in the readings they made on the digital screen. This result can be explained as the advantage provided in digital reading whereby the reader has the freedom to adjust the font and size of the text and to edit the text content according to their personal desires without disturbing it. In addition, the fact that the content is supported with visuals and that computers are interesting make reading more enjoyable, which facilitates understanding and learning (Dyson & Haselgrove, 2001; Chen, 2003; Burnett & Myers, 2006; Merchant, 2007; Carden, 2008; Muir, Veale & Nichol, 2009; Rose, 2011). According to Matthew (1996; cited in Duran & Alevli, 2014), interacting with and reading a book on a computer screen can be motivating even for the most reluctant of readers. On the other hand, there are also studies revealing that printed text readings are more effective for reading comprehension than digital readings (Ben-Yehudah and Eshet-Alkalai, 2020; Delgado, Vargas, Ackerman, & Salmerón, 2018; Kong, Seo, & Zhai, 2018; Singer & Alexander, 2017). This can be explained by the fact that the information received piecemeal in digital reading reduces the level of comprehension and prevents the reader from progressing (Güneş, 2010).

Considering the results obtained in the research, recommendations for further studies on reading miscues are as follows:

1. In this study, the readings of printed and digital texts were discussed within the scope of the 'Miscue Analysis Inventory' developed by Goodman et al. (2005). Future studies conducted on digital text reading with different reading miscue analysis inventories will contribute to the literature in terms of findings.

2. Digital text reading is used effectively at all levels of education. Therefore, it is recommended that digital text and printed text readings are also examined comparatively for other age groups.

3. In this research, printed and digital reading miscues were studied comparatively using a narrative text. When the literature is examined, it is seen that in terms of data in digital and printed text reading studies, there are differences according to the text type. Therefore, the comparison of digital and printed text reading miscues can also be investigated within the context of informative text.

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