

Investigation of reading error types, reading levels and reading speeds of students with special learning difficulties

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Abstract

The main aim of this study is to investigate reading error types, reading levels and reading speeds of students with special learning difficulties (SLD). A case study model was used in the research. The research was carried out with 34 students enrolled in Grades 3–8, who were diagnosed with SLD in Konya in the 2019–2020 academic year. In the data analysis, while ‘error analysis’ was used for reading error types, the formula $\text{Number of Words Correctly Read} \div \text{Total Word Number of Text} \times 100$ was utilised to determine reading levels. As for the identification of reading rates, the number of words read correctly in one minute was determined. According to the results of the research, the error types displayed by the students with SLD in the texts that are suitable for the classes that they attend and in the texts that belong to lower grade levels than their actual grade levels were found to be misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction and reversing sounds.

Keywords: Special learning difficulties, reading difficulty, reading error types, reading levels, case study.

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1. Introduction

According to DSM-V (2013), special learning difficulty (SLD) is defined as ‘a neurodevelopmental disorder with a biological origin that forms the basis of abnormalities at the cognitive level’. In a different definition, SLD can be expressed as the occurrence of problems in listening, thinking, speaking, reading, writing and mathematical fields due to the effect of one or more cognitive processes in understanding and using the written and spoken language (Fuchs, Fuchs, Mates & Lipsey, 2000; Silver et al., 2008). It is not known exactly what caused SLD (Bender, 2004). However, genetic factors are thought to be important among the causes of SLD (Snowling, 2013). The prevalence of SLD among schoolchildren in the academic fields of reading, writing and mathematics is between 5% and 15%. As of its gender prevalence, it is 3/2 more common in boys than girls (DSM-V, 2013). According to DSM-V (2013), SLD is divided into three subtypes which are reading disorder (dyslexia), written expression disorder (dysgraphia) and numerical (mathematics) disorder (dyscalculia). While students may only have problems in one of these areas, students who have problems in all three areas are also encountered (Bender, 2004; Melekoglu & Sak 2017). However, studies indicate that approximately 80% of individuals with learning difficulties (Eden & Vaidya, 2008) have problems with reading disability (Bender, 2004; Eden & Vaidya, 2008; Silliman & Scott, 2006).

According to DSM-V, reading difficulty (dyslexia) is used to describe the problems experienced by the individual in terms of word reading accuracy, reading speed and fluency, and reading comprehension despite having average intelligence and education. In other words, individuals with reading difficulties have great problems in decoding words (Snowling, 2013).

Students with reading difficulties have difficulties in recognising letters, syllables, words (Graham & Bellert, 2004; Vaughn, Bos & Schumm, 2003), fluency in reading and/or reading comprehension (Graham & Bellert, 2004; Snowling, 2013; Vaughn, Bos & Schumm, 2003), using appropriate reading strategies and separation in common text structure. Misreading problems are also among the most common problems that these students encounter (Graham & Bellert, 2004; Vaughn, Bos & Schumm, 2003, p. 40). In addition, students with reading difficulties have difficulties such as confusing letters, reading in reverse, skipping letters, skipping syllables, adding letters, adding syllables, skipping lines (Akyol, 2011, p. 233; Muter & Snowling, 2009), and recognising and pronouncing words (Yilmaz, 2008). Problems observed in students with reading difficulties are having less vocabulary knowledge when compared to their peers (Baydik, 2011; Bender, 2004), having problems in establishing cause and effect relationships, determining the main idea of the text that they read and making inference (Bender, 2004) and being behind their peers in terms of reading speed (Bender, 2004; Guzel-Ozmen, 2005; Saripinar & Erden, 2010; Snowling, 2013). In his research, Balci (2019) determined that the reading levels of all SLD students were at the level of anxiety.

It is important to use reading skills effectively since the difficulties encountered while learning reading skills will also be encountered in the writing skill of the individual (Melekoglu & Sak, 2017; Snowling, 2013). Besides this, reading skill is also important in mathematics because students have to understand what they read to solve a math fact. This situation causes children with SLD to face academic difficulties throughout their school life (Melekoglu & Sak, 2017). For this reason, this study was carried out to examine the reading error types, reading levels and reading speeds of students with Special Learning Difficulties, and the following sub-objectives regarding students with Special

Learning Disabilities were answered in this research:

- 1) What are the types of errors in the texts that are suitable for their class levels?
- 2) What are the types of errors in the texts they read in accordance with their subclass levels?
- 3) What are their reading levels in the texts that are suitable for their class levels?
- 4) What are their reading levels in the texts they read in accordance with their subclass levels?

5) What is the number of words per minute in the texts that are suitable for their class levels?

6) What is the number of words read per minute in the texts they read in accordance with their subclass levels?

2. Method

This section includes research model, data collection tools, data collection process and data analysis process.

2.1. Research model

This study examines the reading error types, reading levels and the number of words per minute of the students with SLD in the reading texts they read which are suitable for their class levels and two levels lower than their class levels. To this end, the Case Study model was used in the research. A case study is an in-depth research approach in which the researcher examines and defines situations whose limits are determined within a time frame using data collection tools such as observation, interview, audiovisual documents and reports (Creswell, 2007).

2.2. Sample of the research

The research was carried out in Konya in the fall semester of the 2019–2020 academic year, and 34 students attending in Grades 3–8 of primary and secondary schools in Konya participated in the study using a random sampling method. All the students participating in the research, whose demographic information was given in Table 1, were diagnosed with SLD and had reading difficulties.

Table 1. The demographic information of the students participating in the research

Gender	N	%	Grade	Age	Number of students	%	
Female	13	38.24	Third grade	8	6	17.65	
Male	21	61.76	Fourth grade	9	7	20.59	
			Fifth grade				
			Sixth grade	10	6	17.65	
			Seventh grade	11	4	11.76	
			Eighth grade	12	3	8.82	
				13	8	23.53	
Total	34	100%			34	100%	

As seen in Table 1, 13 (38.24%) female and 21 (61.76) male students participated in the study. Of these participants, six students (17.65%) were at the third-grade level, seven students (20.59%) were at the fourth-grade level, six students (17.65%) were at the fifth-grade level, four students (11.76%) were at the sixth-grade level, three students (8.82%) were at the seventh-grade level and eight students (23.53%) were at the eighth-grade level.

2.3. Data collection tools

In the research, demographic information forms and reading texts were used to collect data. In the demographic information form, there are sections including information such as the students' age, gender, class and the school they attend. As reading texts, six texts in the Turkish language coursebooks belonging to the class that the students were attending and six texts in the Turkish language coursebooks belonging to two classes lower than the students' actual class level were randomly selected. In other words, six reading texts from the eighth-grade Turkish language coursebook and six reading texts from the sixth-grade Turkish language coursebook were chosen for the students who attended eighth grade. Twelve reading texts were included in the study for each student. In determining the texts, first, the publishing houses of the coursebooks which the students study in their Turkish language classes were determined and then the texts were chosen from the Turkish language coursebooks of other publishing houses sent by the ministry of education. In addition, the students, their teachers and families were interviewed and asked if the students had read the selected reading texts before (it was asked during the reading phase). With these measures, the possibility for the students participating in the research to read the selected reading texts before has been tried to be eliminated.

2.4. Data collection process

For the research, first, official permission was obtained from the Directorate of National Education of Konya, and it was shown to school principals during the visit. Then, the students with SLD were determined by the psychological counselling and guidance teachers of the schools. Next, the official permission was also shown to the students' class teachers and their families, and the purpose of the research was explained. After obtaining the signed permissions of the families who volunteered for the research, the research was initiated.

While collecting the data, the students were made to sit on a table in a quiet place at the school. The researcher briefly explained that each student would be given 12 texts chosen for them and would want to read them in order. Students were asked to read a total of 12 texts, and their voice was recorded while they were reading the texts. In the study, each student was asked to read six reading texts suitable for the grade they were in, and then six reading texts suitable for two grades lower than the students' actual grades. The duration of the study varied between 25 and 33 minutes per student.

2.5. Data analysis

The voice recordings, which were recorded to determine the reading error types of the students with SLD in the texts that are suitable for the grade levels that they were attending and the reading error types in the texts, which are two grade levels lower than their actual grades, were analysed using the "error analysis" technique. To determine the reading error types of the students, the reading error types in a total of four texts, two reading texts suitable for their grade levels and two reading texts two grades lower than their actual grade levels, were analysed. According to Sucuoglu and Kargin (2006), 'error analysis' is used to assess reading, reading comprehension, writing and math skills. In the error analysis technique, the areas where students have difficulties are determined. When using the error analysis technique, certain stages should be considered. First, the areas (reading, reading comprehension or writing) where students will be evaluated should be determined. In the second stage, attention should be paid to ensure that reading texts are appropriate for students' level and as for the third stage, assessment should be made, and in the last stage, results should be recorded.

The reading levels of the students participating in the research were calculated using the formula $\text{Number of Words Correctly Read} \div \text{Total Word Number of Text} \times 100$ for the texts that are appropriate for the students' level and for the texts that are two grades lower than their actual grade levels. According to this formula, the students who were found to be at 89% and below are expressed as 'Anxiety Level', the ones at 90%–95% are 'Education Level' and those at 96% and above

are ‘Free Level’ (Akyol, 2011; Yüksel, 2010). To determine the reading levels of the students, the reading levels in four texts, two reading texts suitable for their levels and two reading texts suitable for two grades lower than their actual grade levels were calculated.

In the study, the time was recorded to determine the average number of words read in 1 minute in the texts suitable for the students’ levels and the same was done for the reading texts two grades lower than their actual grade levels. For calculating the number of words the students read in one minute, the number of words they read wrongly was deducted from the number of words in the text they read and how many correct words were read in one minute was found. To determine the number of words read by the students in one minute, the students were asked to read a total of four texts, two reading texts suitable for their levels and two reading texts that are two grades lower than their actual grade levels. One minute after the students read the texts, they were asked to stop reading. Then, the number of correct words in the texts they read was determined by taking the average of the two types of texts read per minute.

2.6. Findings

As a result of the data and analysis obtained in this section, the presented findings regarding students with SLD are as follows:

- 1) Reading error types in the texts suitable for the students’ levels and those of in the texts that are lower than their actual grade levels,
- 2) Reading levels in the texts suitable for the students’ levels and in the texts that are lower than their actual grade levels,

Grade	Error types
Third grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n)
Fourth grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/ word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n)
Fifth grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n)
Sixth grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (for example, confusing p with b or b with d, u with n)
Seventh grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (for example, confusing p with b or b with d, u with n)
Eighth grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n)

3) Findings related to the average number of words read in one minute in the texts are suitable for the students' levels, and the same variable in the texts that are lower than their actual grade levels. In Table 2, reading error types of students with SLD in the texts that are suitable for their grade levels were presented.

Table 2. Reading error types in the texts that are suitable for the grade levels of the students with SLD

In Table 2, when analysing the reading error types in the texts that are suitable for the grade levels of the students with SLD, misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b, b with d and u with n) error types can be seen. In addition, it was determined that these reading error types did not differ according to the classes and similar reading error types were made in all classes. The point that attracts attention in the study is that not all students exhibit all of these reading error types, in other words, while some of the students participating in the study exhibit some of the reading error types, the others do not. In Table 3, reading error types of students with SLD in the texts that are lower than their actual grade levels were presented.

Table 3. Reading error types of the students with SLD in the texts that are lower than their actual grade levels

Grade	Error types
Third grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g. confusing p with b or b with d, u with n)
Fourth grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n)
Fifth grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n)
Sixth grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n)
Seventh grade	Misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n)
Eighth grade	

In Table 3, when the reading error types of the students with SLD in the texts that are lower than the actual grade levels are analysed, misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n) error types can

be seen. In addition, it was found that these reading error types did not differ according to the classes and similar reading error types were made in all classes.

When Tables 2 and 3 are compared, the reading error types, which the participating students made, were detected to be similar while reading the texts that are suitable for the grade levels and lower than the actual grade levels of them. In addition to this finding, it was found that not all students exhibit all of these reading error types but a few of them. In Table 4, information about the reading levels of the students with SLD in the texts that are suitable for their class levels was presented.

Table 4. Reading levels of the students with SLD in the texts that are suitable for their class levels

Grade	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8
Third grade	68% Anxiety level	65% Anxiety level	80% Anxiety level	65% Anxiety level	67% Anxiety level	87% Anxiety level		
Fourth Grade	71% Anxiety level	91% Education level	48% Anxiety level	92% Education level	88% Anxiety level	90% Education level	69% Anxiety level	
Fifth grade	68% Anxiety level	85% Anxiety level	53% Anxiety level	77% Anxiety level	73% Anxiety level	71% Anxiety level		
Sixth grade	92% Education level	78% Anxiety level	77% Anxiety level	35% Anxiety level				
Seventh grade	26% Anxiety level	25% Anxiety level	70% Anxiety level					
Eighth grade	60% Anxiety level	47% Anxiety level	61% Anxiety level	71% Anxiety level	40% Anxiety level	82% Anxiety level	80% Anxiety level	83% Anxiety level

In Table 4, when the reading levels of the students with SLD in the texts that are suitable for their grade levels are analysed, the level of three students attending the fourth grade and the level of one student attending the sixth grade were found to be at the education level. Besides this, all the other participating students were found to be at the anxiety level. In Table 5, information regarding the reading levels of the students with SLD in the texts that are lower than their actual grade levels was presented.

Table 5. The reading levels of the students With SLD in the texts that are lower than their actual grade levels

Grade	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8
Third grade	70% Anxiety level	64% Anxiety level	82% Anxiety level	80% Anxiety level	64% Anxiety level	80% Anxiety level		
Fourth grade	87% Anxiety level	90% Education level	68% Anxiety level	91% Education level	90% Education level	77% Education level	61% Anxiety level	
Fifth grade	73% Anxiety level	86% Anxiety level	65% Anxiety level	91% Education level	73% Anxiety level	78% Anxiety level		
Sixth grade	94% Education level	80% Anxiety level	87% Anxiety level	45% Anxiety level				
Seventh grade	70% Anxiety level	27% Anxiety level	77% Anxiety level					
Eighth grade	82% Anxiety level	59% Anxiety level	69% Anxiety level	81% Anxiety level	48% Anxiety level	89% Anxiety level	88% Anxiety level	90% Education level

In Table 5, when the reading levels of the students with SLD in the texts that are lower than the actual grade levels are analysed, the reading level of three students attending the fourth grade and the level of one student attending the sixth grade were found to be at the education level. However, all the other participating students were found to be at the anxiety level.

When Tables 4 and 5 are compared, it was found that there is a partial increase in the reading levels of the students in Grades 5-8 in the texts that belong to lower grade levels than their actual grade levels. It was also discovered that there is a partial increase and decrease in the reading levels of the students attending Grades 3 and 4 in the texts that belong to lower grade levels than their actual grade levels when compared to the texts suitable for their grade levels. In Table 6, information about the average number of words read in one minute by the students with SLD in the texts suitable for their grade levels was presented.

Table 6. The average number of words read in one minute by the students with SLD in the texts suitable for their grade levels

Grade	Student1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8
Third grade	47	30	60	39	19	39		
Fourth grade	14	22	20	77	48	14	92	
Fifth grade	39	78	20	39	21	65		
Sixth grade	31	28	48	8				
Seventh grade	45	20	48					
Eighth grade	15	29	9	21	81	58	55	60

When the information presented in Table 6 about the average number of words read in one minute by the students with SLD in the texts suitable for their grade levels was examined, a student in the fourth grade was detected to be at the level of his/her typically developing peers by reading an average of 92 words per minute. However, the average number of words per minute of 33 other students who participated in the study was found to be lower than their typically developing peers. In Table 7, information about the average number of words read in one minute by the students with SLD in the texts that belong to two grade levels lower than their actual grade levels was presented.

Table 7. The average number of words read in one minute by the students with SLD in the texts that belong to two grade levels lower than their actual grade levels

Grade	Student1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8
Third grade	45	28	59	31	14	36		
Fourth grade	45	30	24	81	43	19	87	
Fifth grade	38	65	18	48	32	73		
Sixth grade	51	39	70	17				

Seventh grade	45	28	67					
Eighth grade	26	37	13	26	93	70	56	60

In Table 7, when the data regarding the average number of words read in one minute by the students with SLD in the texts that belong to two grade levels lower than their actual grade levels were analysed, a student in the fourth grade was discovered to be at the level of his/her typically developing peers by reading an average of 87 words per minute. On the other hand, the average number of words read per minute by the other 33 students who participated in the study was found to be lower than their typically developing peers.

Comparing Tables 6 and 7, it was found that the average number of words read in one minute by third-grade students in the texts that are appropriate to their grade levels was slightly higher than the average number of words they read in the texts that belong to lower grade levels. However, in the majority of the students attending other grades, it was detected that the average number of words per minute in texts suitable for their grade levels was lower than the average number of words they read per minute in texts that belong to lower grade levels.

3. Discussion

First, the fact that the number of participating students with SLD is high, the participating students attend different classes in different grades and are at different ages, and the texts read in this study are both suitable for their grade levels and two grades lower than their actual grade levels are the features that are considered to be important for this research. In this research, the error types of the students with SLD in the texts suitable for the classes that they attend and in the texts that belong to lower grade levels were found to be misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction and reversing sounds (e.g., confusing p with b, b with d or u with n). These findings are similar to the studies in the literature (Akyol, 2011; Dinc, 2017; Ergul, 2012; Graham & Bellert, 2004; Kuruoglu & Sen, 2018; Muter & Snowling, 2009; Vaughn, Bos & Schumm, 2003). In addition, it is thought-provoking that although the participating students, all of whom diagnosed with SLD, attend different grades, they made similar reading errors. Another thing which is considered to be important for this research is that these reading errors are common among the students with SLD.

According to the results of this research, it was observed that the types of reading errors did not differ according to the classes of each student and that the same student exhibited similar reading errors in all classes. In addition, all of the students with SLD, who participated in the study, did not exhibit all types of reading errors observed in learning disabilities. In other words, while some of the students participating in the study exhibit some of the reading error types, the others do not. In addition, it was observed that the students who participated in the study had similar reading error types while reading the texts suitable for their grade levels and lower grades. This result shows that the reading errors of students with SLD do not differ according to the level of texts they read and no matter whether the texts are suitable for their grades or lower grades.

While the reading level of four students with SLD, who participated in the study, was found to be at the education level in the texts they read, which are suitable for their grade levels, the same variable for 30 students was found to be at the anxiety level. Considering the reading levels of the students in the texts suitable for lower class levels, seven students were detected to be at the education level and 27 students were found to be at the anxiety level. When we look at the literature, in a study carried out with 47 students with SLD who attended Grades 5-8, Balci (2019) determined that the correct reading percentages of all students with SLD were at the anxiety level. In the light of these

results, it is thought that the majority of the reading levels of students with SLD are at the anxiety level, and the reading levels did not significantly change in the texts suitable for their grade levels or lower grade levels.

According to Kurdoglu and Uslu (2002), the average number of words read in a minute by primary school students in Turkey for the first graders is 45.30, 73.13 for the second grader, 91.46 for the third graders, 97.07 for the fourth graders and 120.76 for the fifth graders. However, Rasinski (2009) states that the fifth graders read 118–128 words, the sixth graders read 135–145 words, the seventh graders read 157–167 words and the eighth graders read 166–171 words on an average per minute. In this study, it was observed that all the students with SLD were below the level of their typically developing peers in terms of the number of words read per minute in the texts suitable for their grade levels and in the texts they read lower than their actual grade levels. When compared with the literature, it is clearly seen that the average number of words read by students with SLD in one minute is far behind the reading speed of their typically developing peers. This situation supports the finding that Ozmen (2005) determined in his research indicating that when students with SLD read texts whose content is already known, this situation increases the number of correct words read in one minute. Another thing this finding supports is that the text content should be selected appropriately for students' lives in order to increase their reading speed. In other words, it is thought that it is important to increase the number of words that students with SLD read correctly in one minute and that the content of the texts they read should be compatible with students' lives. In addition, the fact that the number of words correctly read by students with SLD in one minute is behind their typically developing peers is thought to be due to their weak phonological awareness and inadequate word recognition (Cayir & Balci, 2017; Manis, Doi & Bhadha, 2000; Vellutino, Fletcher, Snowling & Scanlon, 2004).

4. Results

In the research, the error types of the students with SLD in the texts that are suitable for the classes that they attend and in the texts that belong to lower grade levels were found to be misreading, hesitating while reading, repeating, omitting a sound/syllable/word or skipping a line, substituting a sound/syllable or a word, pausing while reading, correction, reversing sounds (e.g., confusing p with b or b with d, u with n). Moreover, it was also detected that the reading errors of students with SLD are similar in the texts they read no matter the texts are suitable for their grades or lower grades. Another result of this study is that the reading level of the majority of the students with SLD is at anxiety level in the texts that are suitable for the classes that they attend and in the texts that belong to lower grade levels. Finally, it was also detected for almost all of the students with SLD who participated in this study that the average number of words read in a minute is behind their typically developing peers.

5. Recommendations

This research is limited to 34 students with SLD and Konya city in Turkey. In addition, the reading texts that are suitable for the students' grade levels that they attend and the texts that belong to two grades lower than their actual grade levels were selected. Further research can be conducted on reading error types, reading levels and average words read in a minute by choosing reading texts that are suitable for different grade levels for students with SLD.

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