sciendo

Acta Educationis Generalis
Volume 12, 2022, Issue 3

DOI: 10.2478/atd-2022-0027

A Cross-Sectional Examination of the Written Expression Skills of Students with Low Vision, Visual Impairments, and their Sighted Peers

Cem Aslan - Salih Cakmak*

Received: January 7, 2021; received in revised form: April 24, 2021;
accepted: April 26, 2021

Abstract:

Introduction: Several studies in the literature have investigated writing skills of students with visual impairment and low vision. However, no research was found to examine the written expression skills of students with visual impairment in terms of text cohesion, text coherence, text quality, text length, and writing time variables. A more comprehensive approach to research on the written expression skills of students with visual impairments and low vision is needed.

Methods: In this study, a cross-sectional design was employed to examine the written expression skills of students with low vision, visual impairment, and their sighted peers. Participants of this study consist of 344 secondary school students who were divided into three groups: Visual impairment, low vision, and sighted peers. During the application process, all students were given two different guidelines (six in total) for each text type (memoir, persuasive, informative) and asked to write about the instructions they chose. As a result, all students wrote three different texts. Texts scored on text length, writing time, text quality, coherence level, and cohesion levels. Descriptive statistics and statistical comparisons of groups were provided. Whether written expression skills of students differed according to groups was determined by one-way analysis of variance, which is one of the parametric tests.

Results: In this research, the mean of students with visual impairment and sighted peer's text length and writing time differed statistically. And in this study, the average of students with visual impairment and sighted peer's coherence level and text quality differed statistically.

Discussion: It can be stated that students with visual impairment do not consider their thoughts in integrity, have difficulty in concluding their articles, their texts remain as an introduction, and generally write low-quality texts. In this study, the

* Cem Aslan, Gazi University, Faculty of Education, Department of Special Education, Ankara, Turkey; cemaslan@gazi.edu.tr
Salih Cakmak, Gazi University, Faculty of Education, Department of Special Education, Ankara, Turkey; salih_cakmak@gazi.edu.tr

mean of students with visual impairment, low vision, and sighted peer's coherence level and text quality differed statistically. There are significant differences between students in all text types except for persuasive text. While there was no difference in memoir and persuasive text at the level of cohesion, were significant differences among students in terms of informative text and total scores. There are studies in the literature that are in line with these results. Thus, it can be said that results obtained from the present research are parallel to the literature.

Limitations: The results obtained from this research are limited to memoir, persuasive and informative texts. The variables are limited to text length, writing time, text coherence, text quality, and cohesion level. Having each student write three different texts simultaneously (consecutively) in a single session can be given as another limitation of the research.

Conclusions: In this research, memoir, persuasive, and informative text types were used. In future research, texts such as discussion and stories can be writing, or variables such as effort, motivation, and writing tendency can be examining. Further research on fluency and legibility regarding the mechanical aspect of writing can be planning, or spelling mistakes of students with visual impairment can be investigating. Experimental research focusing on teaching writing strategies can be done. Activities should be organized by teachers to motivate students about writing, encourage them, and increase their interests. If teachers include writing activities, this can serve to the improvement of students with visual impairments. Students who try to write should be supported. Considering the limitations of students with visual impairment in terms of writing skills, technologies that will serve these students' better writing should be used.

Key words: written expression skills, visual impairment, writing, low vision, sighted peers.

Introduction

Writing is one communication tool and is one of the basic skills each student should learn. The traditional goals of writing skills have been academic, professional, and social (Feldman, 2011). Writing skills allows students to spread their knowledge and demonstrate what they know (Harris & Graham, 2013). Writing skills play a significant role in the school, business, and social life (Graham & Harris, 2005). Writing skills can be discussed in two dimensions: (1) mechanical dimension (writing process), which is generally related to the formal appearance of the writing, and (2) content dimension (expression of ideas), which relates to the discovery of a written product. Written expression is the realization of a written essay withal using a combination of some cognitive and metacognitive processes according to the characteristics of the text types (Harris, 1993). In other words, writing expression is a highly complex and demanding process (Englert & Mariage, 2003).

1 Students with visual impairments and written expression

Written expression skills are among the curriculum objectives. However, many students have difficulty in these skills (Ozmen, Selimoglu, & Simsek, 2015). One of the groups of students who have a hurdle in written expression skills is those with visual impairment and low vision. Students with visual impairment may learn writing expression skills as a natural outgrowth of oral expressions like their sighted peers (Harley, Truan, & Sandford, 1997). The notion of literacy as such has recently often been put into relation with preschool age (Tamášová & Šulganová, 2016). When viewed from this angle, while students with visual impairment have limited access to braille before they start school, their sighted peers start reading after exposure to print in an informal way (Dodd & Corn, 2000). Many students with visual impairment may not be exposed to print or braille until they reach preschool or kindergarten (Hatton, Erickson, & Lee, 2010). Braille is complex and tactile writing. Therefore, students with visual impairment acquire reading and writing skills later. Also, students with visual impairment are slower readers than sighted students (Dodd & Conn, 2000). For the plurality of students with visual impairment learning to write is the same process as for their sighted peers, although they may need more planning, more consideration, and more time (Arter, McCall, & Bowyer, 1996; Swenson, 1999). These factors can cause students with visual impairment to underperform their sighted peers (e.g. Harris-Brown, Richmond, Maddalena, & Jaworski, 2015; Kreuzer, 2007; Meieran, 1985).

2 Students with low vision and written expression

Handwriting is a complex skill that depends on the integration of many skills such as fine motor coordination, spelling, and sentence construction (Harley et al., 1997; Watson, Wright, Wyse, & De L'Aune, 2004), and requires a combination of visual, motor, and cognitive skills (Markowitz, 2006). All are necessary to communicate ideas through writing. Therefore, for students with low vision, writing is a challenging skill. The kinesthetic information or/and sensory input restricts development. So, students with low vision academic skills such as writing are inadequate (Aki, Atasavun, & Kayihan, 2008; Barraga & Erin, 2001; Bishop, 2004). Besides, the writings of students with low vision can be quietly short, and they may be reluctant to write (Corley, Robinson, & Lockett, 1989). An irregular pattern may appear in their writings, and discrepancies may seem between the letters they write (Arter, Mason, McCall, McLinden, & Stone, 1999).

3 Current research

Several studies investigated writing skills students with visual impairment and low vision. For example, handwriting abilities (Harris-Brown et al., 2015), expressive writing skills (Koenig, 1987), writing practices (Kreuzer, 2007), writing samples (Erin & Wright, 2011; Savaiano & Hebert, 2019), written expressive language (Meieran, 1985; Tulumovic & Huremovic, 2012), writing performance (Aki et al., 2008; Atasavun Uysal & Aki, 2012), the impact of a braille-note on writing (Kamei-Hannan & Lawson, 2012), written expression skills (Aslan & Cakmak, 2020), writing instructional practices (Hebert & Savaiano, 2020), promote the handwriting accuracy (Chang, Lo, & Chuang, 2020) were examined. However, no research was found to investigate the written expression skills of students with visual impairment and low vision in terms of text cohesion, text coherence, text quality, text length, and writing time variables. In this context, it is possible to mention the need for further research and the contribution that the present study can make to knowledge in the literature. In this study, the written expression skills of students with visual impairment and low vision and their sighted peers were compared. Therefore, this research is considered significant. The results to be obtained can serve to the understanding of whether vision affects written expression skills or not, as well as determining students' status. Besides, it can help prepare content for writing intervention programs. Thus, arrangements can make in line with the needs of the students. In particular, this research is expected to provide important information on deciding which skills require educational measures. Finally, it is thought that it can direct teachers in specific issues such as patterning, implementation, development, evaluation, and monitoring in processes related to teaching written expression skills. The purpose of the current study is to examine written expression skills with a cross-sectional sample of students with low vision, visual impairment, and their sighted peers. The following research questions guide the study:

1. Do the text length of students with low vision, visual impairment, and their sighted peers differ from each other?
2. Do the writing time of students with low vision, visual impairment, and their sighted peers differ from each other?
3. Do the cohesion level of students with low vision, visual impairment, and their sighted peers differ from each other?
4. Do the quality level of students with low vision, visual impairment, and their sighted peers differ from each other?
5. Do the coherence level of students with low vision, visual impairment, and their sighted peers differ from each other?

4 Methods

In this study, a cross-sectional design was employed to examine the written expression skills of students with low vision, visual impairment, and their sighted peers.

4.1 Participants

Participants of this study consist of 344 secondary school students who were divided into three groups: Visual impairment, low vision, and sighted peers (see Table 1). Students with visual impairment and low vision included in the study depending on the following criteria: (1) diagnosis of visual impairment, (2) being between the fifth grade and the eighth grade, (3) using braille (students with visual impairment) or regular text (students with low vision) as a writing tool, (4) writing a memoir about what they did during the weekend using five or more sentences (Guzel-Ozmen, 2006). Students were excluded if they had multiple disabilities (Harris-Brown et al., 2015; Kreuzer, 2007). There were no other exclusion criteria. Sighted peers were included in the study depending on the following criteria: (1) students with no visual impairment or diagnosis of motor or/and intellectual disabilities (Harris-Brown et al., 2015). (2) writing a memoir about what they did during the weekend using five or more sentences (Guzel-Ozmen, 2006), (3) being between the fifth grade and the eighth grade, (4) matching with the participants in other student groups in terms of grade level. Demographic data of the participants are given in Table 1.

Table 1

Participant demographics

Variables	*Category*	*LV*		*VI*		*SP*		*Total*	
Gender	Female	48	43.2	62	54.9	48	40	158	45.9
	Male	63	56.8	51	45.1	72	60	186	54.1
Grade Level	5th	29	26.1	30	26.5	30	25	89	25.9
	6 th	25	22.5	29	25.7	30	25	84	24.4
	7 th	27	24.3	27	23.9	30	25	84	24.4
	8 th	30	27.1	27	23.9	30	25	87	25.3
Type of School	School for The Visual Impairment	54	48.6	97	85.8	-	-	151	43.9
	Public School	-	-	-	-	120	100	120	34.9
	Inclusive School	57	51.4	16	14.2	-	-	73	21.2

LV: Students with Low Vision, VI: Students with Visual Impairments, SP: Sighted Peers

4.2 Data collection tools

4.2.1 Text length

Text length was measured by counting the number of words in students' text (Lane et al., 2008). All text samples written by the students were transferred to the computer. The word count tool that was involved in the word processing software was used to calculate the total text length. Text length was calculated for each text type.

4.2.2 Writing time

Writing time was measured using stopwatches for each text type. The total writing time duration was measured, starting with the instructions until the finish of writing. Writing time was calculated for each text type.

4.2.3 Cohesion level

For the assessment of the level of text cohesion, The Scale for Evaluating Cohesion Level was used (Coskun, 2005). The scale consists of five cohesion measures and 24 items. Scoring is done according to the frequency of use of the cohesion measures. The overall reliability of the scale is r=.99. The scale can use for different text types. Two independent researchers scored the texts. Inter-scorer reliability (ISR) was 86.8% for memoir, 92.1% for persuasive text, and 98.6% for informative text.

4.2.4 Text quality

The Holistic Assessment was used to assess the quality of the texts (Saddler, 2006). The assessment score ranges from 1 to 7 points. The texts written by 5th, 6th, 7th, and 8th-grade students were taken as the basis for scoring text quality. Each of the texts was assessed by the authors. Those texts that were agreed and received 2, 4, and 6 scores, were chosen for holistic assessment. The texts written by the students were scored using these texts. ISR was 80.9% for memoir, 78.2% for persuasive text, and 85.1% for informative text.

4.2.5 Text coherence

The Holistic Coherence Scale was utilized (Bamberg, 1984; Zorbaz, 2010) for assessment of the level of text coherence. The scale consists of five points ranging from unscorable or miscellaneous (0 points), incomprehensible (1 point), incoherent (2 points), partially coherent (3 points), and fully coherent (4 points). The overall reliability of the scale is r=.739. The scale can use for different text types. Two independent researchers scored the texts. ISR found 81.8% for memoir, 83.3% for persuasive text, and 84.6% for informative text.

For all variables, disagreements were resolved by discussing with the first author to obtain the final score.

4.3 Procedure

The data collection process of the research was completed in the 2018-2019 academic year. In the data collection process, firstly, compulsory legal permission was obtained by the Ministry of National Education. Then, ethical approval was obtained by Gazi University Ethics Committee. Then the application started. During the application, all students were given two different guidelines (six in total) for each text type (memoir, persuasive, informative) and asked to write about the instructions they chose. The instructions were presented randomly in a mixed order. As a result, all students wrote three different texts. For this, various materials were given to the students. For example, students in the sighted peer group were given a standard booklet with instructions and blank pages for writing. The students wrote their texts starting from the text type they wanted. For students in low vision group, instructions were prepared with alternative font sizes (e.g. 12, 14, 16, 18, 20, 22, 24, 26, 28) (Atasavun Uysal & Duger, 2012) and the "Century Gothic" font (Cakmak, Karakoc, Safak, & Kan, 2014). Instructions were given in preferred font sizes to students with low vision. Besides, students were allowed to use materials such as bold-lined paper. Instructions were prepared in braille format for students with visual impairment. Each instruction was written on separate pages. The presentation of instructions to students was made in a mixed (random) order to prevent order effect and selection bias.

Time recording started when the students began to write, to be valid for all students. In this research, the written expression skills of students were investigated. Therefore, no feedback was given to the students about the content of their writings. However, some encouraging expressions such as well done, you can continue writing, and very well were used for the writing process. There was no restriction regarding students' writing time and text length. The writing time was recorded by the researchers. Writing texts written by students were collected. Each student was given a code number, and the application process was completed by thanking the students.

4.4 Data analysis

All data collected from students were transferred to the computer for statistical analysis. Then, data analysis started. We used the SPSS for the statistical analysis of the data. In the evaluation of the study data, descriptive statistics used. Increasing the reliability of a study and consistently interpreting the findings at the outset requires choosing appropriate statistical techniques. These depend on factors, such as the research model, distribution of measured variables, and sample size. Therefore, firstly, analyze the normal distribution of the data. The suitability of data to normal distribution was tested utilizing the Shapiro-Wilk and Kolmogorov-Smirnov tests. The kurtosis and skewness values

show that the data obtained are suitable for normal distribution (Tabachnick & Fidell, 2013). Accordingly, whether the written expression skills of students differed according to groups was determined by one-way analysis of variance (ANOVA), which is one of the parametric tests. Post-Hoc Scheffe test was used to determine the source of the difference. The analyses were performed at a .95 confidence interval. The significance of the analyses was evaluated at the $p<0.05$ level.

5 Results

5.1 Text Length

ANOVA results determining whether students differ in text length are presented in Table 2.

Table 2

Results of ANOVA test on students' text length according to groups

Text Type	*Text Lenght Scores*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Meaningful Difference*
Memoir	Between Groups	14379.578	2	7189.789	6.734	.001*	SP > VI
	Within Groups	364082.256	341	1067.690			
	Total	378461.834	343				
Persuasive	Between Groups	3971.232	2	1985.616	2.722	.067	-
	Within Groups	248742.486	341	729.450			
	Total	252713.718	343				
Informative	Between Groups	33018.580	2	16509.290	12.354	.000*	SP > LV
	Within Groups	455714.301	341	1336.406			SP > VI
	Total	488732.881	343				
Total	Between Groups	120395.039	2	60197.519	10.249	.000*	SP > LV
	Within Groups	2002783.540	341	5873.266			SP > VI
	Total	2123178.578	343				

**p<0.05*

The results of the ANOVA test presented in Table 2 indicated that the average scores of the students statistically varied according to the text types of memoir

(F=6.734; p<.05), informative (F=12.354; p<.05), and total (F=10.249; p<.05). On the other hand, the average scores of the students were not statistically significant in terms of persuasive (F=2.722; p>.05). According to Post-Hoc Scheffe Test, the difference in memoir is between students with visual impairment and sighted peers; text length differences in informative and total are between sighted peers with students with visual impairment and low vision (p<.05).

5.2 Writing time

ANOVA results, conducted to determine whether there is a difference between the writing times of students, are shown in Table 3.

Table 3

Results of ANOVA test on students' writing times according to groups

Text Type	*Writing Time Scores*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Meaningful Difference*
Memoir	Between Groups	2519485.722	2	1259742.861	6.455	.002*	VI > LV
	Within Groups	66546538.833	341	195151.140			
	Total	69066024.555	343				
Persuasive	Between Groups	3593334.699	2	1796667.349	13.390	.000*	VI > LV
	Within Groups	45753771.057	341	134175.282			VI > SP
	Total	49347105.756	343				
Informative	Between Groups	2409160.959	2	1204580.480	7.144	.001*	VI > LV
	Within Groups	57498083.134	341	168616.080			
	Total	59907244.093	343				
Total	Between Groups	25155462.991	2	12577731.495	10.833	.000*	VI > LV
	Within Groups	395936906.960	341	1161105.299			VI > SP
	Total	421092369.951	343				

**p<0.05*

When Table 3 is examined, a significant difference is seen between students with visual impairment, low vision, and sighted peers in terms of all text types (Memoir: F=6.455; p<.05; Persuasive: F=13.390; p<.05; Informative: F=7.144;

p<.05) and total writing time (F=10.833; p<.05). According to Post-Hoc Scheffe Test, there was a difference between students with visual impairment and low vision in memoir and informative; students with visual impairment, low vision, and sighted peers in persuasive and total writing time (p<.05).

5.3 Cohesion level

ANOVA results, conducted to determine whether there is a difference between the levels of cohesion between students with low vision, visual impairment, and sighted peers, are presented in Table 4.

Table 4

Results of ANOVA test on students' cohesion levels according to groups

Text Type	*Cohesion Level Scores*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Meaningful Difference*
Memoir	Between Groups	956.016	2	478.008	2.967	.053	-
	Within Groups	54936.167	341	161.103			
	Total	55892.183	343				
Persuasive	Between Groups	66.645	2	33.323	.328	.721	-
	Within Groups	34662.235	341	101.649			
	Total	34728.881	343				
Informative	Between Groups	3999.877	2	1999.939	13.821	.000*	SP > LV
	Within Groups	49343.832	341	144.703			SP > VI
	Total	53343.709	343				
Total	Between Groups	7544.033	2	3772.017	5.272	.006*	SP > VI
	Within Groups	243966.339	341	715.444			
	Total	251510.372	343				

**p<0.05*

According to Table 4, the cohesion levels of students with low vision, visual impairment, and sighted peers memoir (F=2.967; p>.05) and persuasive text (F=.328; p>.05) texts do not differ significantly. Conversely, a significant difference was found between students with low vision, visual impairment, and

sighted peers in terms of informative (F=13.821; p<.05) and total coherence (F=5.272; p<.05). These differences are in favor of sighted peers.

5.4 Text quality

ANOVA results, conducted to determine whether students' text quality varies among groups, are presented in Table 5.

Table 5

Results of ANOVA test on students' text quality according to groups

Text Type	*Text Quality Scores*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Meaningful Difference*
Memoir	Between Groups	36.782	2	18.391	5.935	.003*	LV > VI
	Within Groups	1056.707	341	3.099			
	Total	1093.488	343				
Persuasive	Between Groups	48.520	2	24.260	9.614	.000*	LV > VI
	Within Groups	860.500	341	2.523			LV > SP
	Total	909.020	343				
Informative	Between Groups	38.169	2	19.085	6.290	.002*	SP > VI
	Within Groups	1034.595	341	3.034			
	Total	1072.765	343				
Total	Between Groups	238.315	2	119.158	7.452	.001*	LV > VI
	Within Groups	5452.568	341	15.990			
	Total	5690.884	343				

**p<0.05*

When Table 5 is examined, significant differences are observed between students with low vision, visual impairment, and sighted peers in terms of all text types (Memoir: F=5.935; p<.05; Persuasive: F=9.614; p<.05; Informative: F=6.290; p<.05) and total text quality (F=7.452; p<.05). According to Post-Hoc Scheffe Test, there was a significant difference between students with visual impairment and low vision in terms of memoir and the sum text quality; between low vision, visual impairment, and sighted peers in terms of persuasive; and between sighted peers and students with visual impairment in terms of informative (p<.05).

5.5 Text coherence

ANOVA results, conducted to determine whether there is a difference between students' text coherence levels, are shown in Table 6.

Table 6

Results of ANOVA test on students' text coherence levels according to groups

Text Type	*Text Coherence Scores*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Meaningful Difference*
Memoir	Between Groups	30.937	2	15.469	10.019	.000*	LV > VI
	Within Groups	526.502	341	1.544			
	Total	557.439	343				
Persuasive	Between Groups	19.327	2	9.664	7.995	.000*	LV > VI
	Within Groups	412.161	341	1.209			LV > SP
	Total	431.488	343				
Informative	Between Groups	22.221	2	11.110	7.407	.001*	LV > VI
	Within Groups	511.497	341	1.500			SP > VI
	Total	533.718	343				
Total	Between Groups	158.423	2	79.212	9.962	.000*	LV > VI
	Within Groups	2711.298	341	7.951			SP > VI
	Total	2869.721	343				

**p<0.05*

When Table 6 is analyzed, a statistically significant difference is seen between students with visual impairment, low vision, and sighted peers students in terms of all text types (Memoir: F=10.019; p<.05; Persuasive: F=7.995; p<.05; Informative: F=7.407; p<.05) and total coherence level (F=9.962; p<.05). According to the Post-Hoc Scheffe Test result, the difference is between visual impairment and low vision groups in terms of memoir; between low vision, visual impairment and sighted peers in terms of persuasive; between students with low vision, visual impairment, and sighted peers in terms of informative and total text coherence (p<.05).

6 Discussion

6.1 Text Length and writing time

In this study, the text length and writing time scores of students with visual impairment, low vision, and sighted peers differed statistically. In the literature, there are studies supporting this finding (e.g. Aki et al., 2008; Atasavun Uysal & Aki, 2012; Harris-Brown et al., 2015; Koenig, 1987; Kreuzer, 2007; Meieran, 1985). In this respect, the findings obtained from the research are consistent with the literature. In the study, sighted peers wrote the highest number of words, and students with visual impairment wrote the lowest number of words. Students with visual impairment used the longest time, and students with low vision used the shortest time. These findings coincide with the research in the literature (e.g. Harris-Brown et al., 2015; Kreuzer, 2007). The writing time of students with visual impairment is very high compared to low vision students and their sighted peers. This result may be due to braille. Because braille is one of the significant issues that students with visual impairment have difficulties in (Heller, D'Andrea, & Forney, 1998). On the other hand, handwriting may be an arduous activity for students with visual impairment (Arter, 1997). Factors such as writing from right to left in braille, pressing the dots that make up the letters one by one, using abbreviations, the tactile nature of writing, and fatigue of hands or fingers while writing, can slow down the writing process. Therefore, students with visual impairment may experience a significant waste of time writing. This situation may cause students with visual impairment to fall behind their sighted peers. Swenson (1999) emphasizes that students with visual impairment need more time and effort to become competent writers.

Students with low vision writing time are low compared to other students. This result may be associated with limitations in motor skills or visual factors. Restriction in the sense of vision may lead to delays in fine and gross motor skills of students with low vision (Arter et al., 1996). Since handwriting is a complex skill that depends on the integration of many abilities, such as fine motor coordination, spelling, and sentence construction (Harley et al., 1997; Watson et al., 2004), and requires a combination of visual, motor, and cognitive skills (Markowitz, 2006). Students with low vision are a heterogeneous group in terms of many features, and their functional vision levels differ from each other. Students with low vision may not be able to see the area they will write as a whole. As a result, the writing process for this student can be tiresome and often lead to difficulties (Downes, Walker, & Fletcher, 2015). Some students with low vision may need to look very closely at the page to see what they are writing (Arter, 1997; Holbrook, Koenig, & Rex, 2010). In this case, students with low vision may have eye fatigue, watering eyes, or sore eyes. These factors are thought to affect low vision students' writing performance, especially in terms of time.

6.2 Cohesion level, text coherence, and text quality

In this study, the mean of students with visual impairment, low vision, and sighted peer's coherence level and text quality differed statistically. There are significant differences between students in all text types except for persuasive text. While there was no difference in memoir and persuasive text at the level of cohesion, significant differences were observed among students in terms of informative text and total scores. There are studies in the literature that are in line with these results (e.g. Koenig, 1987; Kreuzer, 2007; Meieran, 1985; Tulumovic & Huremovic, 2012). Thus, it can be said that results obtained from the present research are parallel to the literature. Sighted peers have the highest average in cohesion levels, while students with low vision have the highest average in-text coherence and text quality. Students with visual impairment have a lower average score compared to other students. As reported in the study of Erin and Wright (2011), some students wrote long, expressive essays that were filled with miscues, while others wrote short unimaginative passages that were free of errors. Kreuzer (2007) stated that students with visual impairment scored significantly lower compared to sighted peers. In the study of Koenig (1987), students with visual impairments, especially in the age group of 17, performed poorly than their sighted peers. In this respect, the results obtained from the research support the literature.

The results given above may have been due to the lack of knowledge, skills, and experience of students with visual impairment. Lack of experience, knowledge, vocabulary and cultural characteristics can affect many written expression skills. Students with visual impairment may have inefficient experience due to visual limitations and experience limited prior knowledge, language skills, and vocabulary (Meieran, 1985). For students with visual impairment, learning this skill is very difficult (Plimmer, Crossan, Brewster, & Blagojevic, 2008). Students with visual impairment may not have clear and sufficient knowledge of the meanings of some words and may use some words that they cannot visualize. These can cause these students to have difficulty in writing. It can also be reflected in the content of the texts they write (Erin & Wright, 2011). Another significant factor is that students with visual impairment are more concerned with the mechanical dimension of writing (please see the findings on the writing time). Students with visual impairment who spent a lot of time on writing mechanics may have ignored the content of their writing. These can be seen as a reason for the low level of compatibility, text quality, and text coherence. It can be said that the written expression skills of students with visual impairment are not at the desired level. According to the findings obtained from the research, students with visual impairments write papers that are less consistent and have low text quality and limited text coherence. In other words, it can be stated that they do not consider their thoughts in integrity, have difficulty in concluding

their articles, their texts remain as an introduction, and generally write low-quality texts.

The writing process comprises planning, drafting, editing, and revising strategies (Graham & Harris, 2005). These strategies help improve written expression skills and increase text quality and length (De La Paz & Graham, 1997). However, all students participating in this research wrote their articles at once. They did not use strategies such as editing and revising. Kamei-Hannan and Lawson (2012) state that students with visual impairment start writing without any plan or preparation. However, students who write in braille seldom use prewriting strategies (Ely, 1989), and they often wrote a single draft without revisions (Gere, 1982). Failure to use these strategies could potentially affect the written expression skills of students with visual impairment. Thus, students with visual impairment may have performed poorly than other students.

7 Limitations

The results obtained from this research are limited to memoir, persuasive and informative texts. The variables are limited to text length, writing time, text coherence, text quality, and cohesion level. Having each student write three different texts simultaneously (consecutively) in a single session can be given as another limitation of the research. However, obtaining permissions repeatedly from the relevant schools for each application where data is collected from many students and take a long time data collection process made it compulsory to collect the research data in a single session.

Conclusion

In this research, memoir, persuasive, and informative text types were used. In future research, texts such as discussion and stories can be writing, or variables such as effort, motivation, and writing tendency can be examining. Furthermore, these variables can be dealt with in various contexts, such as gender, school attended, and the writing tool used. Further research on fluency and legibility regarding the mechanical aspect of writing can be planning, or spelling mistakes of students with visual impairment can be investigating. Experimental studies focusing on teaching writing strategies can be done. Relational research can be carried out, for instance, to examining the effect of the writing tool used on the length. Finally, larger samples can be studied to increase the generalizability of the findings.

Activities should be organized by teachers to motivate students about writing, encourage them, and increase their interests. If teachers include writing activities, this can serve to the evolution of students with visual impairments. Students who try to write should be supported. Students should be made aware

of text structures and elements. These should contain different text types rather than a specific text type. Considering the limitations of students with visual impairment in terms of writing skills, technologies that will serve these students' better writing should be used. Freeing students in topic selection can motivate them and make them more willing to write.

References

Aki, E., Atasavun, S., & Kayihan, H. (2008). Relationship between upper extremity kinesthetic sense and writing performance by students with low vision. *Perceptual and Motor Skills, 106*(3), 963-966. https://doi.org/10.2466/pms.106.3.963-966

Arter, C. (1997). English. In H. Mason, S. McCall, C. Arter, M. McLinden, & J. Stone (Eds.), *Visual impairment: Access to education for children and young people* (pp. 207-217). New York: David Fulton.

Arter, C., Mason, H. L., McCall, S., McLinden, M., & Stone, J. (1999). *Children with Visual Impairment in Mainstream Settings*. London: David Fulton.

Arter, C., McCall, S., & Bowyer, T. (1996). Handwriting and children with visual impairments. *British Journal of Special Education, 23*(1), 25-29. https://doi.org/10.1111/j.1467-8578.1996.tb00939.x

Aslan, C., & Cakmak, S. (2020). Examining written expression skills of low vision, visually impaired and sighted students in the context of text type. *Journal of Mother Tongue Education, 8*(3), 868-885. https://doi.org/10.16916/aded.741627

Atasavun Uysal, S., & Aki, E. (2012). Relationship between writing skills and visual motor control in low vision students. *Perceptual and Motor Skills: Perception, 115*(1), 111-119. https://doi.org/10.2466/24.27.25.PMS.115.4.111-119

Atasavun Uysal, S., & Duger, T. (2012). Writing and reading training effects on font type and size preferences by students with low vision. *Perceptual and Motor Skills, 114*(3), 837-846. https://doi.org/10.2466/15.10.11.24.PMS.114.3.837-846

Bamberg, B. (1984). Assessing coherence: A reanalysis of essays written for the national assessment of educational progress, 1969-1979. *Research in the Teaching of English, 18*(3), 305-319. https://www.jstor.org/stable/40171021

Barraga, N. C., & Erin, J. N. (2001). *Visual Impairments and Learning*. Austin: Pro-Ed.

Bishop, V. E. (2004). *Teaching Visually Impaired Children*. Springfield: Charles C. Thomas.

Cakmak, S., Karakoc, T., Safak, P., & Kan, A. (2014). Identifying the reading speed of low vision student's at elementary level. *International Journal in IT and Engineering, 2*(10), 38-48.

Chang, C. J., Lo, C. O., & Chuang, S. C. (2020). Applying video modeling to promote the handwriting accuracy of students with low vision using mobile technology. *Journal of Visual Impairment & Blindness, 114*(5), 406-420. https://doi.org/10.1177/0145482X20953269

Corley, G., Robinson, D., & Lockett, S. (1989). *Partially Sighted Children*. NFR-NELSON.

Coskun, E. (2005). *Cohesion, Coherence and Text Elements in Narrative Texts of Primary School Students* (Unpublished doctoral dissertation). Ankara: Gazi University.

De La Paz, S., & Graham, S. (1997). Effects of dictation and advanced planning instruction on the composing of students with writing and learning problems. *Journal of Educational Psychology, 89*(2), 203-222. https://doi.org/10.1037/0022-0663.89.2.203

Dodd, B., & Conn, L. (2000). The effect of Braille orthography on blind children's phonological awareness. *Journal of Research in Reading, 23*(1), 1-11. https://doi.org/10.1111/1467-9817.00098

Downes, K., Walker, L. L., & Fletcher, D. C. (2015). SKread predicts handwriting performance in patients with low vision. *Canadian Journal of Ophthalmology*, *50*(3), 225-229. https://doi.org/10.1016/j.jcjo.2015.02.002

Ely, R. (1989). Writing, computers, and visual impairment. *Journal of Visual Impairment and Blindness, 83*(5), 248-252. https://doi.org/10.1177/0145482X8908300520

Englert, C. S., & Mariage, T. (2003). The sociocultural model in special education interventions: Apprenticing students in higher-order thinking. In L. H. Swanson, K. Harris & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 450-467). New York: Guilford.

Erin, J. N., & Wright, T. S. (2011). Learning to write in Braille: An analysis of writing samples from participants in the alphabetic Braille and contracted (ABC) Braille study. *Journal of Visual Impairment & Blindness*, *105*(7), 389-401. https://doi.org/10.1177/0145482X1110500702

Feldman, D. (2011). Beyond the classroom: Writing as therapy. *Journal of Poetry Therapy*, *24*(2), 93-104. https://doi.org/10.1080/08893675.2011.574355

Gere, A. R. (1982). Insights from the blind: Composing without revising. In R. Sudol (Ed.), *Revising: New essays for teachers of writing* (pp. 52-70). National Council of Teachers of English.

Graham, S., & Harris, K. R. (2005). *Writing better: Effective strategies for teaching students with learning difficulties*. London: Baltimore.

Guzel-Ozmen, R. (2006). The effectiveness of modified cognitive strategy instruction in writing with mildly mentally retarded Turkish students. *Council for Exceptional Children, 72*(3), 281-297. https://doi.org/10.1177/001440290607200302

Harley, R. K., Truan, M. B., & Sandford, L .D. (1997). *Communication Skills for Visually Impaired Learners: Braille, Print, and Listening Skills for Students Who Are Visually Impaired*. Springfield, Illinois: Charles C Thomas.

Harris, J. (1993). *Introducing Writing*. London: Penguin.

Harris, K. R., & Graham, S. (2013). "An adjective is a word hanging down from a noun": Learning to write and students with learning disabilities. *Annals of Dyslexia, 63*(1), 65-79. https://doi.org/10.1007/s11881-011-0057-x

Harris-Brown, T., Richmond, J., Maddalena, S. D., & Jaworski, A. (2015). A comparison of the handwriting abilities of secondary students with visual impairments and those of sighted students. *Journal of Visual Impairment & Blindness, 109*(5), 402-412. https://doi.org/10.1177/0145482X1510900510

Hatton, D. D., Erickson, K. A., & Lee, D. B. (2010). Phonological awareness of young children with visual impairments. *Journal of Visual Impairments & Blindness, 104*(12), 743-752. https://doi.org/10.1177/0145482X1010401203

Hebert, M., & Savaiano, M. E. (2020). A survey of the writing instructional practices of

Nebraska teachers of students with visual impairments. *Exceptionality*, 1-16. https://doi.org/10.1080/09362835.2020.1850450

Heller, K. W., D'Andrea, F. M., & Forney, P. E. (1998). Determining reading and writing media for individuals with visual and physical impairments. *Journal of Visual Impairment & Blindness*, *92*(3), 162-175. https://doi.org/10.1177/0145482X9809200304

Holbrook, M. C., Koenig, A. J., & Rex, E. J. (2010). Instruction of literacy skills to children and youths with low vision. In A. L. Corn, & A. J. Koenig (Eds.), *Foundations of Low Vision: Clinical and Functional Perpectives* (pp. 484-526). New York: AFB.

Kamei-Hannan, C., & Lawson, H. (2012). Impact of a Braille-note on writing: Evaluating the process, quality, and attitudes of three students who are visually impaired. *Journal of Special Education Technology*, *27*(3), 1-14. https://doi.org/10.1177/016264341202700301

Koenig, A. J. (1987). *A Study of Expressive Writing Skills of Blind Students Including Partial Replication of the National of Educational Progress Third Writing Evaluation* (Unpublished doctoral dissertation). Nashville: Faculty of George Peadbody College for Teachers of Venderbilt University.

Kreuzer, D. T. (2007). *An Analysis of Writing Practices in 4th- and 5th-Grade Students with Visual Impairments* (Unpublished doctoral dissertation). California: University of California Berkeley with San Francisco State University.

Lane, K. L., Harris, K. R., Graham, S., Weisenbach, J. L., Brindle, M., & Morphy, P. (2008). The effects of self-regulated strategy development on the writing performance of second-grade students with behavioral and writing difficulties. *The Journal of Special Education*, *41*(4), 234-253. https://doi.org/10.1177/0022466907310370

Markowitz, M. (2006). Occupational therapy interventions in low vision rehabilitation. *Canadian Journal of Ophthalmology*, *41*(3), 340-347. https://doi.org/10.1139/I06-020

Meieran, G. M. (1985). *Written Expressive Language of Children with Low Vision* (Unpublished doctoral dissertation). Pittsburgh: University of Pittsburgh.

Ozmen, E. R., Selimoglu, O. G., & Simsek, M. O. (2015). Implementation of modified cognitive strategy instruction on story writing: A case study with a student with intellectual disability. *Ankara University Faculty of Educational Sciences Journal of Special Education*, *16*(2), 149-164. https://doi.org/10.1501/Ozlegt_0000000225

Plimmer, B., Crossan, A., Brewster, S. A., & Blagojevic, R. (2008). Multimodal collaborative handwriting training for visually-impaired people. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 393-402). ACM.

Saddler, B. (2006). Increasing story-writing ability through self-regulated strategy development: Effects on young writers with learning disabilities. *Learning Disability Quarterly, 29*(4), 291-305. https://doi.org/10.2307/30035555

Savaiano, M. E., & Hebert, M. (2019). A cross-sectional examination of the writing of students with visual impairments. *Journal of Visual Impairment & Blindness, 113*(3) 260-273. https://doi.org/10.1177/0145482X19854921

Swenson, A. M. (1999). *Beginning with Braille: Firsthand Experiences with a Balanced Approach to Literacy*. New York: AFB.

Tabachnick, B. G., & Fidell, L. S (2013). *Using multivariate statistics*. UpperSaddle River.

Tamášová, V., & Šulganová, Z. (2016). Promotion of family reading in the context of children's early reading literacy development. *Acta Educationis Generalis, 6*(2), 9-28.https://doi.org/10.1515/atd-2016-0009

Tulumovic, S., & Huremovic, A. (2012). Written expression of students with and without visual impairment. *The Journal of International Social Research, 5*(20), 372-378.

Watson, G. R., Wright, V., Wyse, E., & De L'Aune, W. (2004). A writing assessment for persons with age-related vision loss. *Journal of Visual Impairment & Blindness, 98*(3), 160-167. https://doi.org/10.1177/0145482X0409800306

Zorbaz, K. Z. (2010). *The Relationship between Middle School Students Writing Apprehension and Blocking with Their Written Expression Skill* (Unpublished doctoral dissertation). Ankara: Gazi University.