Peertechz

ENGINEERING GROUP

TRENDS IN Computer Science and Information Technology
OPEN ACCESS JOURNAL

ISSN: 2641-3086 DOI: https://dx.doi.org/10.17352/tcsit

Review Article

Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School

Sevim Bahadır[1] and Oğuzhan Bahadır[2]*

[1]Kahramanmaras Cukurova Electrical Anatolian High School, Kahramanmaras, Turkey

[2]Department of Mathematics, Faculty of Science, Kahramanmaras Sutcu Imam University Kahramanmaras, Turkey

Received: 07 October, 2024
Accepted: 15 October, 2024
Published: 16 October, 2024

***Corresponding author**: Oğuzhan Bahadır, Department of Mathematics, Faculty of Science, Kahramanmaras Sutcu Imam University Kahramanmaras, Turkey, Email: oguzbaha@gmail.com; obahadir@ksu.edu.tr

ORCiD: https://orcid.org/0000-0001-5054-8865

Keywords: Visually impaired; Learning process; Special education; Learning difficulties

https://www.engineegroup.us

Check for updates

Abstract

This study aims to identify the challenges encountered by visually impaired students during their learning process at school. The sample of the study consists of all students (25 students) studying at Ertuğrul Gazi School for the Visually Impaired in Onikişubat district of Kahramanmaraş province in Turkey, covering grades 5 to 8. The study was conducted during the 2021 academic year, utilizing the qualitative research method with interviews as the primary data collection technique.

Through the analysis of the data obtained from the interviews, it was revealed that visually impaired students face difficulties in the learning process at school, primarily stemming from the inadequacy of the school's physical conditions. The most significant challenge among these difficulties is the lack of auditory cues and routes. Additionally, learning difficulties arise from the materials used in classes and the implementation of measurement and evaluation practices for visually impaired students.

Introduction

Educational activities are organized taking into account factors such as individuals' age and developmental levels. These activities encompass individuals who possess the necessary competence in terms of health conditions, as well as those referred to as disabled. Disability is used to describe individuals whose full and effective participation in society, under equal conditions with others, is limited due to certain levels of inadequacies in their intellectual, physical, sensory, or mental abilities resulting from any cause. These individuals are also influenced by different attitudes, perspectives, or environmental conditions within society and may require counseling and support services throughout their lives [1].

Education programs tailored for individuals with special needs exist across the spectrum from preschool to higher education, which constitutes formal education. Individuals with intellectual disabilities, hearing impairments, visual impairments, and gifted individuals require special education based on their specific characteristics [2]. Special education is the process of organizing educational variables related to reducing, preventing, or eliminating conditions that significantly impair communication, academic, motor, and adaptive areas for individuals [3].

When examining the development level of a country, it is crucial to emphasize whether all individuals living in that country benefit equally and according to their needs from all services provided. The extent to which a country provides the opportunity for its citizens to live in good conditions and improves the level and quality of education determines the degree of modernization. Therefore, special education is not only a concern for parents with children with special needs but also a matter that concerns society and the country as a whole [4].

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085

Visual impairment and its causes

With the increase in various disabling conditions due to the rise in diseases in societies, the social visibility of visually impaired individuals and others with disabilities has also increased [5]. Blindness is defined in two ways: educational and legal. According to the legal definition, individuals with one-tenth or 20/200 visual acuity or less in the seeing eye, or those with a visual angle not exceeding twenty degrees, are considered blind, including all corrections [3]. Globally, there are at least 2.2 billion people with visual impairment or blindness (www.who.int.news). Although there has been a decrease in the prevalence of blindness and visual impairment worldwide, the number of people affected by blindness and visual impairment has increased due to the growing and aging world population [6].

There are many factors that contribute to the development of visual impairment. Some of these include genetics, damage to the eyes, nutritional deficiencies, infections, and refraction problems. Refraction problems such as hypermetropia, astigmatism, myopia, cataracts, and albinism related to the eyes contribute to visual impairment [4]. Those using eye prosthetics, individuals with night blindness (nyctalopia), and color blindness also fall into this group [7]. While 55% of visual impairment occurs due to prenatal factors, the rate caused by hereditary factors, such as both parents or siblings having visual impairment, is around 8% [8]. Aşık Veysel, a well-known figure in Turkish culture, did not have visual impairment from birth. On the other hand, Eşref Armağan, a painter, is an artist with congenital visual impairment [9]. In a study conducted by Zakir, Alam, Askari, and Imran [10] with visually impaired students in Northern India, it was found that 67% of the students had congenital visual impairment, 38% had retina disorders, and there was a 12.8% rate of consanguinity among parents.

Individuals with congenital visual impairment may exhibit certain purposeless movements such as swaying forward and backward or shaking their hands or fingers in front of their faces while standing or sitting. Additionally, due to their inability to visualize people's faces and the appearances of objects, visually impaired individuals may have a passive and meaningless facial expression in the communication process. In their communication with sighted individuals, they may often seem indifferent and disinterested [11]. In this context, visual impairment has been interpreted differently in every society throughout history and is considered as the loss of the most valuable sense of an individual.

Education of visually impaired individuals

From an educational perspective, a visually impaired person is significantly affected by the condition of visual impairment and requires the use of embossed letters or talking books [3]. Every stage of the education of disabled children, including the purpose, principles, education plan, play, and the responsibilities of both the child and the family, teachers, and society, is crucial [12]. Visually impaired students, despite having the same cognitive capacity and cognitive development characteristics as sighted students, learn without the sense of sight [13]. In daily life, sighted children can effortlessly learn many skills and concepts simply by observing adults, while visually impaired children may struggle to acquire many skills and concepts if the necessary learning experiences are not provided [14].

In this context, the information needs of visually impaired individuals are attempted to be met through various information sources. The resources, tools, and methods used to meet this need are inevitably developed to appeal to the sense of touch and hearing. Individuals in the visually impaired group can benefit from their sense of sight to varying degrees [15]. From this perspective, services and technologies necessary for the social participation and access to information of individuals with visual impairment have been developed today. Firstly, for individuals with low vision, the use of photocopying devices to enlarge font sizes in texts and the use of magnifiers are employed to support individuals in accessing information by adjusting the contrasts between text and background. For individuals who cannot read written material due to severe visual impairment, Louis Braille, who was also visually impaired, developed the Braille system in the 19th century. This system is used to access information through touch [16].

Using the Braille writing system would significantly facilitate the education process for visually impaired students, but this may vary depending on the degree of visual impairment [17]. Therefore, the ability to read Braille is acquired after learning sounds and also learning the abbreviation system. This situation may lead visually impaired students to learn to read later compared to their sighted peers. A first-grade student with visual impairment learns to read and write without abbreviations, in the second and third grades with the abbreviation system, and in the third grade, they fully learn to read and write [14].

Visually impaired students may encounter difficulties in some subjects due to factors arising from their disabilities. While it is assumed that students are equal in the classroom environment, the ways they access and acquire information vary. In this context, teachers need to pay attention to these differences when delivering their lessons [18].

One aspect of the adjustments visually impaired students feel the need for involves the measurement and evaluation practices carried out throughout their educational lives. By conducting necessary examinations of measurement and evaluation practices for visually impaired students, identifying the difficulties they encounter, taking measures to overcome these challenges, and making necessary adjustments, these students can effectively showcase their achievements in educational settings [19].

In a study conducted by [20], it was expressed that the Braille system could be developed for the examinations of visually impaired students. Additionally, they pointed out that conducting automatic speech exams for visually impaired students could reduce their dependency on others and enhance their self-confidence [21].

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085

"Due to the frequent use of visual materials in the educational process of visually impaired students, concepts taught may not be learned with the necessary qualifications. Therefore, experiences should be provided to visually impaired students in a way that they can obtain information from the primary source, as each experience supports concept development in individuals. In this regard, tactile education materials such as tactile maps, books, three-dimensional graphics, and similar materials play a crucial role for visually impaired students [22]. Selecting the correct materials and appropriate methods for the ongoing learning process of visually impaired students can minimize the problems they currently face or may face in the future. As a result, the student's confidence will increase, positively impacting the learning process [23].

In the 21st century, the world perceives information universally, allowing people from every nation, regardless of language, to benefit from this information network as much as they desire. In an environment with such possibilities, it is inconceivable for individuals with disabilities not to benefit from this universal information network. Today, science and technology provide innovations that minimize the obstacles faced by disabled individuals [24]. Considering the significant number of visually impaired individuals in our country, studies related to planning a distance education system with consideration for web accessibility are important for maintaining the quality of education [25]. In this context, identifying the difficulties encountered by visually impaired students in the teaching process is believed to contribute to improving the quality of education. Therefore, the research problem statement is formulated as 'What are the difficulties faced by visually impaired students in their learning processes?'"

Research significance

The condition of visual impairment or blindness can lead to limitations in individuals' lives. In the face of such a condition, individuals' social life, personality development, and ways of benefiting from education can be negatively affected [3]. In this regard, professional-level support in the social and school lives of visually impaired students can reduce the level of negativity arising from their disability. Visually impaired students, like other groups with disabilities, are included in special education. For these students, it is crucial that everyone involved in the education process, starting with the family, is equipped and supported with scientific knowledge and skills for the development of daily life skills related to their social lives and academic knowledge and skills related to their school lives. For example, a mother may need information and support on the steps to follow when teaching daily life skills to her visually impaired child, how a visually impaired teacher should use material related to the lesson, and which measurement tools would be beneficial. Additionally, it is important to evaluate whether the physical structure of the school supports the learning of students. Providing the ideal physical environmental conditions in the educational setting should be considered a crucial factor in developing the abilities of disabled individuals and enabling them to take an active role in social life [26]. In this context, it is believed that the research will contribute to the education adjustments and services provided for visually impaired students by identifying the difficulties they face in the learning process at school. Furthermore, the research may provide guidance to experts and teachers working in the field of developing materials for visually impaired students and ensuring the proper use of these materials. Revealing studies on how visually impaired individuals can access information and shedding light on potential future studies is essential [27]. In this sense, this research, aimed at identifying the difficulties visually impaired students face at school, is expected to contribute to the field and other research endeavors.

Research methodology

This research, aiming to examine the difficulties faced by visually impaired students (grades 5-6-7-8) in the learning process at school, is a qualitative study in the case study design. The case study design allows us to explore situations, concepts, events, experiences, perceptions, and orientations that may appear in our world [28]. Furthermore, the case study design is a research design that provides an opportunity to produce rich narratives and make interpretations based on scientific findings, addressing situations that we know in reality but may struggle to explain with clear scientific statements [29]. In line with this, the research utilizes the interview method, one of the data collection methods in qualitative research. Through interviews, the desired information or even more can be obtained in various types of qualitative interviews [30].

Data collection tools

Many researchers conducting qualitative studies resort to various techniques for data collection to provide a comprehensive and in-depth understanding of their research. Document collection, observation, and interview techniques are predominantly used to enrich these studies [31]. Interview is a research method widely used in the field of social sciences, especially in sociology [28]. Different techniques are frequently used in the interview method to achieve various purposes. One of these is the semi-structured interview technique, where the researcher prepares interview questions in advance [32]. In qualitative research, questions form the heart of the interview. Good questions need to be asked to gather good data for the research. When preparing the interview form, attention should be paid to writing easily understandable questions, asking open-ended questions, and organizing questions in a logical manner [30]. Additionally, conducting a literature review to conceptualize, delimit, and define problem areas in the research is crucial [33].

In this context, this research aimed at examining the difficulties visually impaired students (grades 5-6-7-8) face in the learning process at school, a literature review was conducted first, examining national and international studies related to the subject. To collect data, the researcher prepared a semi-structured interview form and a personal information form. In the process of preparing the interview form, the opinions of three experts from the Faculty of Education Sciences at İnönü University and Yozgat Bozok University were

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085

consulted. Based on expert opinions, questions related to the evaluation of visually impaired students, the school's physical structure, and some expressions were rearranged according to the developmental characteristics of the students. After this arrangement, a pilot study was conducted with three visually impaired students. The interview form was given its final version, and the researcher conducted interviews with visually impaired students.

Sampling of the research

There is only one secondary school for the visually impaired in the province of Kahramanmaraş, where the research was conducted. The sample of the study consists of all students (25 students) studying at Ertuğrul Gazi School for the Visually Impaired in Onikişubat district of Kahramanmaraş province in Turkey during the 2021 academic year. In this research conducted according to the phenomenology design, the sample selection was determined using the purposeful sampling method. Within the purposeful sampling technique, the aim is not to generalize the data directly to the population but to understand the situations or individuals studied in depth [32]. The interviews were conducted with each student for an average of 15-20 minutes and were recorded through both written transcripts and audio recordings. The data obtained after the interviews were completely converted into text and the content analysis method was used to analyze all the data obtained from the research. In content analysis, researchers examine social communication products [34].

In line with this information, the criterion sampling method, which is one of the purposeful sampling methods, was used in this research. The main purpose of criterion sampling is to include candidates who meet a predetermined criterion in the research process [28]. Descriptive statistics for the demographic variables of the students that constitute the sample are presented in Table 1.

When Table 1 is examined, it is observed that the number of male students is higher than female students, and the number of partially sighted students is higher than the completely blind students.

Data collection and analysis

Appointments were arranged with Ertuğrulgazi School for the visually impaired in line with the school's schedule, and data was collected through individual interviews with students in November and December 2021. At the beginning of the interviews, the importance of students sincerely answering questions for the research purpose was explained. The method of creating written records was preferred for collecting data from participating students. During the interview process, students were informed that the shared information would be recorded in writing by the researcher. The interviews lasted between 20-25 minutes. The content analysis method was used to analyze the data obtained through interviews. Content analysis involves a "second reading" to identify factors that influence a person without being seen. In this sense, content analysis is akin to a form of communication psychoanalysis and the art of perceiving conveyed messages [35]. Themes and codes were derived from the data obtained through content analysis. Concepts allow us to reach themes, and through themes, we can make facts more understandable and better organized [28].

Findings

The findings related to learning difficulties arising from the physical characteristics of the school and classroom of visually impaired students (5^{th}, 6^{th}, 7^{th}, and 8^{th} grades) are presented in Table 2.

Table 2 shows that, as seen in the section on physical features, visually impaired students experience learning difficulties due to the physical characteristics of the school and classroom. Visually impaired students mostly (18/25) encounter learning difficulties related to the absence of auditory cues and routes in the school. Some of these students expressed their opinions as follows:

(Student 2): "I would really like to have audible cues to guide us. Because it would make me feel more secure."

(Student 7): "There should be audible routes. Because of their absence, I always have to go with my friends when I want to go somewhere."

Regarding other items in the school (11/25), students mentioned difficulties such as collisions with swings in the park, distraction from the bell sound while walking, and difficulties related to sunlight reflecting on the board in the classroom. Regarding the location of their classrooms (11/25), students expressed difficulties due to being on the second floor. One of these students expressed their thoughts as follows:

(Student 5): "Sometimes I get confused, and during breaks, I accidentally enter other classrooms instead of mine. It would be more comfortable for me if our class were on the ground floor."

Regarding stairs and corridors in the school (9/25), students mentioned struggles due to the length of corridors

Table 1: Descriptive Statistics Results of Students' Personal Characteristics.

Gender	N	%
Female	10	%40
Male Vision status	15	%60
Partially sighted	13	%52
Completely blind	12	%48

Table 2: Findings on the effects of physical practices of the school and classroom on learning.

Theme	Codes	Frequency
Physical Characteristics	Lack of auditory cues and routes	18
	Location of the classroom	11
	Other objects/lighting	11
	Stairs/corridor	9
	Restrooms	3
	Executive rooms	3

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085

and the presence of stairs. Some students also faced difficulties related to bathrooms (3/25) and administrative offices (3/25). One student expressed their opinion as follows:

(Student 1): "The door of the bathrooms hits my head, and the soap placed there for us should always stay in the same place; when it changes, I can't find it."

(Student 15): "Sometimes, when I want to go to the deputy principal's office, I accidentally enter the teachers' room."

Table 3 presents findings related to learning difficulties arising from classes for visually impaired students.

As seen in Table 3 under the theme of classes, visually impaired students experience learning difficulties in their subjects. Among these subjects, students face the most difficulties in mathematics (20/25). The reasons for difficulties in mathematics include topics with visuals, such as triangles and fractions, as well as operations like division, addition, and various problems. Some of these students expressed their difficulties as follows:

(Student 18): "I cannot perceive the shape in questions with visuals in the mathematics class. Therefore, the surroundings of shapes in visual questions can be made prominent in a way that we can feel with silicone."

(Student 9): "I find it very difficult to solve problems because they require a lot of operations."

In English class (14/25), students struggle with the differences in spelling and pronunciation of words. Even if they pronounce them correctly, they express difficulty in writing them accurately. One student expressed their difficulty in English class as follows:

(Student 13): "Our English book has abbreviations. The embossed tablet writes it backward, and we read it from the front. This is not easy for me at all."

In social studies class (12/25), students mentioned difficulties in understanding some topics, memorizing war dates, and solving some questions due to their length. Some students also face difficulties in Turkish class (9/25) concerning activities, finding the meaning of words, understanding some texts, and grasping punctuation marks. Some students (5/25) expressed difficulties in science class. One student shared their thoughts:

(Student 11): "When text readings are done, I find it very difficult to find the main idea of that text."

Regarding the theme of expectations, visually impaired students expressed their opinions the most (8/25) about the need for individual explanations of misunderstood topics for each student. Some students mentioned the necessity of supporting lesson explanations with video recordings (5/25). Some students expressed the view that frequent repetitions (3/25), the use of modeling in lessons (3/25), and taking notes (2/25) would help them in learning. Some students (4/25) stated that they did not have any expectations regarding the lessons.

Table 4 presents findings regarding the learning difficulties that students encounter due to the materials used in classes.

As seen in Table 4 in the materials theme, visually impaired students have indicated the highest difficulty (16/25) with the use of embossed paper. Regarding the encountered difficulty, they expressed that when the embossed paper is thick, it hurts their hands, and when it is thin, the writings are erased more quickly. One of the students who thinks this way expressed himself as follows:

(Student 6): "Writing on thick embossed paper is difficult, it hurts my hand; when it's thin, the writings are erased quickly."

Some students (13/25) mentioned that their hands hurt when using an embossed tablet. One of these students expressed his thoughts as follows:

(Student 4): "Sometimes my hand hurts because of the pen while using the embossed tablet."

Regarding the use of cube stone box, some students (9/25) mentioned difficulties in finding numbers, performing operations requiring parentheses, and arranging cube stones. Some students (8/25) mentioned difficulties in enlarging letters while using computers and expressed challenges in using desktop computers at school due to the absence of screen readers. A student struggling with computer use expressed his thoughts as follows:

Table 3: Regarding the learning difficulties arising from the lessons for the visually impaired.

Theme	Codes	Frequency	Difficulty Reasons
Subjects	Mathematics	20	Visuals (figures), operations, problems
	English	14	Spelling-pronunciation difference
	Social Studies (History)	12	Dates, questions, topics
	Turkish	9	Activities, words, texts, punctuation
	Science	5	Living organisms and questions Clearer expressions can be used.
Expectations			
	Individual narration	8	
	Video support	5	
	Repetition	3	
	Model usage	3	
	Note-taking	2	
	Expectation-free	4	

Table 4: Findings regarding students' learning difficulties arising from the materials used in classes.

Theme	Codes	Frequency	Difficulty Reasons
Materials	Embossed paper	16	Thickness, thinness
	Embossed tablet	13	The pen hurts the hand
	Cube stone case	9	Numbers, sequence, parentheses
	Computer	8	Letters, Screen readers
	Experiment tools	-	(Home supplies)

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085

(Student 15): "I cannot use computers because they don't have screen readers for us."

As for the use of experimental tools, students mentioned that they did not use any materials because there is no laboratory at school. They stated that they conducted experiments on some topics of science class (respiratory system, solar system, etc.) but brought the necessary materials (balloon, bottle, playdough, etc.) from home. Bringing materials from home does not pose any difficulty for them, but they expressed a strong desire for a laboratory at school and the opportunity to conduct experiments.

Findings related to visually impaired students' expectations regarding teaching methods and techniques used in classes are presented in Table 5.

As seen in Table 5, in the theme of methods and techniques, almost all visually impaired students (23/25) found the use of the case study method in classes to be very effective in terms of overcoming their obstacles. They particularly mentioned listening to case studies related to various subjects, such as Turkish, mathematics, and science, especially through audio materials (audiobooks, video recordings, etc.). Regarding the drama technique, some visually impaired students (14/25) mentioned that in class, especially in science lessons on topics like the solar system and chromosomes, and in Turkish lessons with activities related to characters like Nasrettin Hodja and Hacivat Karagöz, their teachers performed dramatization exercises, either portraying a planet or taking on the role of Nasrettin Hodja. One of the students who participated in these activities expressed his thoughts as follows:

(Student 3): "Playing the role of a sister chromosome in their movement towards the poles made me very happy."

Some visually impaired students (12/25) expressed their approval of in-class discussion activities during lessons. They mentioned that they found discussions on various topics to be beneficial because it helped them better understand the lessons and also allowed them to learn about their classmates' thoughts on a particular subject. A student expressing his enjoyment in learning about his friend's thoughts stated:

(Student 7): "I really enjoy hearing my friend's opinion; after all, two heads are better than one."

Regarding the straight lecture technique, some students (9/25) mentioned that they better understood the lessons when only the teacher explained. As for the debate technique, a few students (5/25) found it useful, stating that they occasionally engaged in debates in class. However, they clarified that, instead of structured debates, they often participated in discussions where everyone in the class shared their thoughts on a topic.

In the theme of expectations related to teaching methods and techniques, some visually impaired students (11/25) have expressed that they would find lessons more beneficial if they were filled with more enjoyable activities. Some students (4/25) suggested that using visual materials less during lectures would be better for them because they find it challenging to comprehend visuals. A few students (3/25) mentioned that teachers speaking slowly and clearly would help them better understand the lessons. Additionally, students emphasized the importance of the teacher's tone of voice, stating that they do not enjoy listening to a lesson if the teacher has a soft tone (2/25). Some students (5/25), however, did not express any specific expectations regarding the teaching methods and techniques in their lessons.

The findings related to the difficulties visually impaired students face in written and oral exam practices are presented in Table 6

As seen in Table 6, visually impaired students, in the theme of exams (written), have indicated that the most common difficulty (16/25) they face is that the questions are not provided to them in embossed photocopy form; instead, they have to write the questions during the exam. Some students (12/25) mentioned that they struggle with written exams depending on the type of course, with English being one of the most challenging subjects in this regard. Regarding the challenges in English written exams, students expressed difficulty in correctly spelling words, finding it challenging to write both on

Table 5: Findings regarding the use of teaching methods and techniques used in classes by visually impaired students and students' expectations.

Theme	Codes	Frequency
Method techniques	Sample case	23
	Drama	14
	Classroom discussion	12
	Plain lecture	9
	Disputation	5
Expectations		
	Activities	11
	Materials	4
	Presentation style	3
	Tone of voice Without expectations	2 5

Table 6: Findings on the difficulties encountered by visually impaired students in written and oral exam applications.

Theme	Codes	Frequency	Difficulty Reasons
Exams (Written)	Writing question	16	Student's writing
	Type of course	12	English and Mathematics classes
	Type of question	6	Long questions
	Duration	4	Lack of time
	Emotions	2	Getting excited
	Tablet	1	Unable to find where they left off
Oral exams	-	-	-
Expectations	Embossed photocopy	16	
	English writing	13	
	Multiple choice	4	

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085

a tablet and accurately express abbreviation expressions found in the English book. Mathematics exams were also mentioned as challenging for some students, with visual questions and the use of the cube stone box being cited as reasons for the difficulty.

Concerning the type of questions, some students (6/25) mentioned that they find long questions particularly challenging. Some students (4/25) mentioned struggling to manage time, while others (2/25) stated getting very nervous during written exams. One student also mentioned that finding their place back on the embossed tablet if they leave it during writing is challenging.

All students (25/25) stated that they did not encounter any difficulties with oral exams.

In the theme related to expectations of visually impaired students regarding exam practices, the majority (16/25) expressed the opinion that written exams would be better conducted in embossed paper form, where questions are written and duplicated in advance, rather than having students write the questions themselves during the exam. Some students (13/25) expressed the expectation to be allowed to write words in English exams as they read them, as they often make mistakes when writing otherwise. A few students (4/25) voiced the expectation for exams to be prepared in multiple-choice format.

Results, discussion and recommendations

In this section of the study, the results, discussions, and suggestions obtained from the research are included.

Discussion and recommendations

Problems that spread across various aspects of life make it challenging for individuals with disabilities to live in functional harmony with society. The failure of society to notice and understand individuals with disabilities within the scope of their experiences leads these individuals to withdraw and, consequently, become isolated from society. Moreover, fundamental problems faced by individuals with disabilities, such as inadequate access to educational opportunities, low roles in society, physical discrimination, poverty, and unemployment, are crucial [36]. Enhancing the quality of life for individuals with disabilities and ensuring their integration into society requires the development of skills tailored to their needs [37].

Many visually impaired individuals have partial vision. The percentages of visually impaired individual's ability to see can be expressed with specific ratios. The majority of individuals born with visual impairment are completely blind, but it cannot be stated that all individuals born with visual impairment are completely blind because there may be those who carry partial vision loss from birth [9]. In terms of concept development or cognitive abilities, visually impaired children have been observed to lag behind sighted children. They are particularly less successful in skill areas that require abstract thinking abilities. The inadequacies in these children's concepts or cognitive abilities may either stem from congenital visual impairments or arise from the limitations of appropriate learning experiences created for these children exceeding visual impairment [3].

According to the research results, students experience difficulties related to the physical environment of the school, such as the lack of auditory cues and routes, the location of the classroom, the length of corridors and stairs, and light. Learning environments should be designed to suit the conditions for students to learn. Inadequacies in physical environments are more important for visually impaired students with more visual impairments than for individuals without any impairments [38]. In a study by Küçükcan [39] on the design of accessible environments for disabled users, it was emphasized that physical environmental arrangements for outdoor and indoor spaces, including streets, parks, open green areas, parking lots for urban spaces, building spaces, and adjacent environments such as gardens and building entrances, should be organized according to three basic structures: streets, parks, etc., open green areas, parking lots for urban spaces; building spaces: interiors of buildings; garden, building entrance, etc. Also, it was noted that these transitions should be arranged, and area designs should be made in a way that facilitates rather than obstructs the individual's movement according to the disability.

The research indicates that visually impaired students (grades 5-6-7-8) face difficulties in the learning process related to subjects, such as mathematics with many visual topics, English with different pronunciations and spellings of words, and Social Studies with dates and questions related to the topic. The use of concrete materials in mathematics instruction for visually impaired students is important for facilitating their learning [40]. Due to the abstract nature of the subjects included in science courses, visually impaired students find it difficult to understand this course. Therefore, making adjustments that take into account the needs of students and arranging effective and efficient modifications for science teaching will help in the realization of the teaching [41].

The research indicates that visually impaired students (grades 5-6-7-8) experience learning difficulties related to materials such as embossed papers, embossed tablets, and cube stone boxes. Physical arrangement and adaptation of materials and tools, such as their dimensions, positions concerning light, and their numbers, are essential for visually impaired students in the learning process [41]. Most visually impaired children perform poorly in their studies and are forced to drop out of science and mathematics courses due to a lack of teaching and learning materials [42].

Visually impaired students find teaching methods and techniques such as case studies, drama, discussions, and direct narration useful in understanding their lessons. In addition, students have expectations for increasing the number of activities and materials used in lessons related to teaching methods. Special tools designed for visually impaired individuals should be used to enable them to continue their education [19].

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085

In terms of assessment and evaluation practices, visually impaired students (grades 5-6- 7-8) face difficulties such as writing their own exam questions, struggling with the spelling of words in English exams, sometimes encountering long questions, and feeling nervous. The difficulties of visually impaired students. Information and communication technologies can be used in English lessons [43]. Within the scope of the results obtained from the research, the curriculum prepared by the Ministry of National Education for visually impaired students can be revised in line with the needs of the students. In addition, the functionality of the teaching materials can be increased by redesigning them in accordance with the curriculum of each course. In this way, the learning difficulties of visually impaired students arising from the programs, learning environment, teaching materials, etc. can be eliminated or minimized. In particular, for courses that include abstract concepts and subjects such as mathematics and science, practice classes based on learning by doing and experiencing can be created in these schools within the framework of the cooperation of the Ministry of National Education and the Provincial Directorates of National Education.

This research is limited to the students of a visually impaired secondary school located in the Onikişubat district of Kahramanmaraş province.

Conclusion

- In this study, which aimed to determine the difficulties encountered by visually impaired students (5-6-7-8 grades) during the learning process at school, the following conclusions were reached from the findings obtained.It was concluded that visually impaired students experienced difficulties arising from some factors related to the physical environment of the school, such as the location of the classroom, and the lack of audible stimuli and routes during the learning process.
- It was concluded that visually impaired students experienced some difficulties arising from courses such as English and Mathematics during the learning process.
- It was concluded that visually impaired students experienced learning difficulties arising from the materials used.
- It was concluded that visually impaired students found teaching methods such as drama and discussion methods useful in terms of their learning.
- It was concluded that visually impaired students experienced difficulties regarding measurement and evaluation practices.

Compliance with ethical rules

The research was ensured to comply with ethical rules. The data of the research was collected in accordance with the decision of the Yozgat Bozok University Ethics Committee meeting dated 30.11.2020.

References

1. Mengi A. Difficulties faced by disabled students in the university education process: The case of Van Yüzüncü Yıl University. YYÜ Eğitim Fakültesi Dergisi. 2019;16(1):147-17. Available from: https://dergipark.org.tr/tr/pub/yyuefd/issue/50700/660807
2. Çağlayan N. Examination of graduate theses on art education for individuals with intellectual disabilities in Turkey. Anadolu Journal of Educational Sciences International. 2018;8(2):403-418. Available from: https://doi.org/10.18039/ajesi.454586
3. Özsoy Y, Özyürek M, Eripek S. Introduction to special education. Ankara: Karatepe Yayınları; 1998.
4. Abacı R. Psychological counseling and guidance. Ankara: Okutan Yayıncılık; 2008.
5. Subaşıoğlu F, Atayurt Fenge Z. Visual impairment in the world and Turkey: A timeline. DTCF Dergisi. 2019;59(1):595-645. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3551851
6. Bourne RA, Flaxman SR, Braithwaite T, Cicinelli MV, Das A, Jonas JB, et al. Magnitude, temporal trends, and projections of the global prevalence of blindness and distance and near vision impairment: A systematic review and meta-analysis. Lancet Glob Health. 2017;5:888-897. Available from: https://doi.org/10.1016/s2214-109x(17)30293-0
7. Öztürk M. The reality of disability in Turkey: "Report." İstanbul; 2012.
8. MEB. Child development and education, visual impairment and inclusion. Ankara; 2013.
9. Bülbül MŞ. The possibility of a congenital visually impaired person becoming a physicist in Turkey. Eleştirel Politik Eğitim Dergisi. 2010;2(7):52-59. Available from: https://www.researchgate.net/publication/258804743_Dogustan_gorme_engellinin_Turkiye'de_fizikci_olabilme_ihtimali
10. Zakir SM, Alam MS, Askari SN, Imran M. Pattern of ocular morbidity among students in a school for visually impaired children in North India. Oman J Ophthalmol. 2019;13:24-28. Available from: https://doi.org/10.4103%2Fojo.OJO_194_2018
11. MEB. Support education program for visually impaired individuals at special education and rehabilitation centers. Ankara; 2008.
12. Ulutaşdemir N. Education of disabled children. Fırat Sağlık Hizmetleri Dergisi. 2007;2(5):121-129. Available from: https://www.researchgate.net/publication/311512398_Engelli_Cocuklarin_Egitimi_Education_of_Disabled_Children
13. Okcu B, Yazıcı F, Sözbilir M. Views of visually impaired students at the middle school level on their learning process at school. Amasya Üniversitesi Eğitim Fakültesi Dergisi. 2016;5(1):51-83. Available from: https://dergipark.org.tr/tr/download/article-file/224083
14. MEB. Literacy guide for the visually impaired. Ankara; 2013.
15. Aydın EA. Information access issues of visually impaired university students. Master's thesis, Hacettepe University, Institute of Social Sciences; Ankara; 2011. Available from: https://doi.org/10.15612/BD.2012.170
16. Özsan M, Hasret F. A proposal to facilitate the daily lives of visually impaired individuals: Clothing with Braille alphabet. Mühendislik Bilimleri ve Tasarım Dergisi. 2017;5:89-94. Available from: https://doi.org/10.21923/jesd.62716
17. Okur MR, Demir M. Identification of problems faced by visually impaired learners in their educational experiences and development of solutions for open and distance learning. Açıköğretim Araştırmaları ve Uygulamaları

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085

Dergisi. 2019;5(2):49-62. Available from: https://dergipark.org.tr/tr/pub/auad/issue/45710/576569

18. Demir T, Şen Ü. A study on the learning styles of visually impaired students in terms of various variables. Uluslararası Sosyal Araştırmalar Dergisi. 2009;2(8):155-161. Available from: https://openurl.ebsco.com/EPDB%3Agcd%3A2%3A19495218/detailv2?sid=ebsco%3Aplink%3Ascholar&id=ebsco%3Agcd%3A46990636&crl=f

19. Kamış Ö, Demir E. Examination of classroom assessment processes for undergraduate students with visual impairment. Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi. 2018;19(3):423-450. Available from: https://dergipark.org.tr/tr/download/article-file/529368

20. Shaker MA, Khaliq A, ul Kashif N. Analysis of examination system for visually impaired children. Journal of Educational Research. 2020;23(1):147-157. Available from: https://jer.iub.edu.pk/journals/JER-Vol-23.No-1/9.pdf

21. Bharadwaj KA, Joshi MM, Kumbale NS, Shastry NS, Panimozhi K, Choudhury AR. Speech automated examination for visually impaired students. In: Proceedings of the Second International Conference on Innovative Mechanisms for Industry Applications; 2020. Available from: https://ieeexplore.ieee.org/document/9074847

22. Kuzu Demir EB, Bican MF. A literature review on teaching materials developed for visually impaired students. In: I. Uluslararası Bilim Eğitim Sanat ve Teknoloji Sempozyumu; Nov 2019; İzmir. Available from: https://avesis.deu.edu.tr/yayin/eab8552b-b885-4aa0-8859-638d1de4f38e/gorme-engelli-ogrencilere-yonelik-gelistirilen-ogretim-materyalleri-uzerine-bir-alanyazin-incelemesi

23. Pirgon Y, Babacan E. A case study on piano education for visually impaired students. Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi. 2013;29:193-205. Available from: https://dergipark.org.tr/tr/pub/susbed/issue/61807/924750

24. Şahin A, Sevim O, Çiğdem S, Aydın G. Opinions of visually impaired Turkish language teachers on their educational environment. e-Journal of New World Sciences Academy. 2010;6(1):516-525. Available from: https://dergipark.org.tr/tr/pub/nwsaedu/issue/19821/212151

25. Tanyeri U, Tüfekçi A. Evaluation of a higher education distance education program in terms of its use by visually impaired individuals: The example of GÜUEP. In: International Conference on New Trends in Education and Their Implications; 2010 Nov 11-13; Antalya.

26. Kılıç A, Şahin E. Evaluation of the physical environment quality in preschool design for visually impaired children. Online Journal of Art and Design. 2019;7(1):148-170.

27. Hebebci MT. Hardware and software developed for visually impaired and low-vision individuals. Bilim, Eğitim, Sanat ve Teknoloji Dergisi (BEST Dergi). 2017;1(2):52-62. Available from: https://dergipark.org.tr/en/download/article-file/495381

28. Yıldırım A, Şimşek H. Qualitative research methods in social sciences. Ankara: Seçkin Yayıncılık; 2015.

29. Yaman E. Perceptions of faculty members exposed to psycho-violence (mobbing) regarding organizational culture and climate. Kuram ve Uygulamada Eğitim Bilimleri. 2010;10(1):547-578.

30. Merriam SB. A guide to qualitative research design and application. (Translated by Turan S). Ankara: Nobel Akademik Yayıncılık; 2015.

31. Glesne C. Introduction to qualitative research. (Translated by Ersoy A, Yalçınoğlu P). Ankara: Anı Yayıncılık; 2013.

32. Ekiz D. Scientific research methods. Ankara: Anı Yayıncılık; 2017.

33. Karasar N. Scientific research method. Ankara: Sanem Matbaacılık; 1991.

34. Lune H, Berg BL. Qualitative research methods for the social sciences. Pearson; 2017.

35. Bilgin N. Content analysis in social sciences. Ankara: Siyasal Kitapevi; 2014. Available from: http://dx.doi.org/10.30794/pausbed.803182

36. Besiri A. Education of individuals with disabilities in the context of poverty. TBB Dergisi. 2009;83:353-374. Available from: https://tbbdergisi.barobirlik.org.tr/m2009-83-536

37. Karaca S, Özaltın G. Effectiveness of a structured group training conducted with visually impaired adolescents. Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi. 2010;3(1):5-14. Available from: https://jag.journalagent.com/phd/pdfs/PHD_1_2_77_85.pdf

38. Zorluoğlu SL, Sözbilir M. Needs supporting the learning of students with visual impairment. Trakya Üniversitesi Eğitim Fakültesi Dergisi. 2017;7(2):659-682. Available from: https://doi.org/10.24315/trkefd.279369

39. Küçükcan B. Library buildings and issues faced from the perspective of disabled users. In: The Third International Symposium on Information Management in a Changing World; 2012 Oct 19-21; Hacettepe University, Ankara (Turkey).

40. Atasay M. Design of mathematics materials for visually impaired students. Anadolu Üniversitesi Eğitim Fakültesi Dergisi (AUJEF). 2020;4(2):104-121. Available from: https://doi.org/10.34056/aujef.662203

41. Okcu B, Sözbilir M. Teaching the unit "Electricity in Our Lives" to visually impaired 8th-grade students: The magnet-making activity. Journal of Bayburt Education Faculty. 2016;11(1):203-223. Available from: https://dergipark.org.tr/en/pub/befdergi/issue/23129/247060

42. Akakandelwa A, Munsanje J. Provision of learning and teaching materials for pupils with visual impairment: Results from a national survey in Zambia. British Journal of Visual Impairment. 2012;30(1):42-49. Available from: https://eric.ed.gov/?id=EJ954316

43. Cárdenas J, Inga E. Methodological experience in the teaching-learning of the English language for students with visual impairment. Education Sciences. 2021;11(9):515. Available from: https://doi.org/10.3390/educsci11090515

44. Aslan C. Assistive technologies for the visually impaired. In: Çakmak S, editor. Special Education and Assistive Technologies. Ankara: Vize Yayıncılık; 2016; 56-92. Available from: https://scholar.google.com.tr/citations?user=6QlSvPgAAAAJ&hl=tr

Citation: Bahadır S, Bahadır O. Information of Difficulties Faced by Visually Impaired Students in the Learning Process at School. Trends Comput Sci Inf Technol. 2024;9(3):081-089. Available from: https://dx.doi.org/10.17352/tcsit.000085