

## **Determining the Opinions of Special Education Teachers Regarding the Use of Assistive Technologies for Overcoming Reading Difficulties**

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**Abstract**—Reading is one of the basic skills that the students' need to achieve, however, it is also one of the important competencies that is essential for reaching knowledge. Reading difficulty is a main problem that many teachers are coming across in their classrooms. Students' with reading disabilities not only hinder the teachers' flow of the lesson it also hinders the development of the student's life skills. With the revolution of the technology in the 21ST century, assistive technologies are seen to be applied into the education settings at all levels and in all fields. Therefore, teachers are in need to know about the available technology and special technology programs in order to help their students facing difficulties in acquiring the necessary knowledge and skills. Technological enrichment of teachers' educational environment both facilitates and helps them to motivate students more easily. Technology support into the educational environments of the students with reading difficulties can improve their reading skills and enable them to succeed in reading and comprehending. The present study sought to determine the opinions of special education teachers' regarding using assistive technology for students with reading difficulties. The research design is based on the qualitative case study design with purposeful sampling and easily accessible sampling technique. Researchers developed semi-structured interview form for data collection applied content analysis to analyze the collected data. The analysis of the study found that teacher opinions towards assistive technology usage for overcoming students' reading difficulties are rather moderate. However, teachers' general opinions about assistive technology utilization is promising and developing gradually.

**Keywords**—Reading difficulties, assistive technology, special education teacher, opinion.

## **1 Introduction**

Reading skill achievement is essential and an important competency necessary for knowledge building. Lately there is a consensus that acquiring language is a natural inclination that starts in child's early developmental stage. More strikingly, language is attributed to culture experiences, biological basis and multi environment with the debate that children can recognize their native language intonation before birth [1] [2]. Learning in a playful manner can enable children to be conscious of speech sounds and develop language consciousness paving the way to be proficient in reading [3] [4]. The main problem for non-proficient reader is the lack of decoding [5] [6]. Developing reading for children at risk formalized methodology and usually explicit phonological training is applied. However, 815 studies in the International Journal of Inclusive Education reveal that children with satisfactory decoding proficiency still fail to understand what they read [7]. Therefore, teachers' knowledge of child's development and how their thinking is demonstrated regarding language is crucial for necessary intervention and individual educational programmes (IEPs).

[8] Discusses in his study that special education remedies are seen to be validated and students still have reading difficulties. Many other studies reveal the striking result of students lagging behind all through their school life in terms of their reading development [9]. Common interventions like phonological awareness training can improve some students reading [10].; [11] [12]. However, the question of fulfilling the needs of the ones that are not improving needs to be answered. The options for overcoming reading difficulties of the students not responding to traditional comprehensive and intense training have been discussed by some researchers like [13] and digital assistive technology are discussed to be an answer to this major problem [9] [15]. Teachers' struggling with such problems get burnt-out and feel helpless from time-to-time, for this reason regular teacher education should provide training regarding students at risk of developing reading difficulties.

Students' failure with the traditional remedies for necessary performance development for recent and future development and also not acquiring needed satisfactory academic degree are the two main reasons to consider utilizing Assistive technology (AT) in the education environment [15]. AT is any product, equipment, system either customized or modified which is utilized for developing or giving opportunities to both teacher and student in terms of upgrading their functional capabilities [16]. According to the Individuals with Disability Education Act (IDEA) in the US, any equipment that is used to improve functional capabilities of individuals with disabilities is considered AT. In the US, the approach to AT is inclusive. It includes not only the technological devices or software that assists the learner with disability, but also all the raft of services and professionals, teachers and family members who will be in the team work for the benefit of the students to enable greater outcomes. Furthermore, according to the IDEA, the selection, acquisition and or use of AT is dependent on the evaluation of the needs of the child. With the importance of the appropriate use of AT, there is a clear need for an adequate level of expertise of at least one of the team members who is working with the students with learning difficulties [17]. Critical

tools like AT helps disabled students by fulfilling their needs and supporting them to have access to their environment [18].

Stimulating learning of reading and providing an alternative way to access the text can be given as two main functions of assistive reading applications [19]. Technologies like TTS and STT can be applied to either facilitate or replace reading. However, the cost, availability and the teachers’ knowledge are issues to consider before implementing AT into education settings. Students with reading disabilities usually utilize inexpensive software programs like Prizmo having OCR and text-to-speech functions. This application allows user students to crop the images that are scanned and can read texts aloud and also highlighted the read words. Voice Dream Reader is another application of text-to speech that readers can read PDF’s, Webpages and Word documents. Additional features like note taking, adjustable fonts, speed, voice type, dictionary and text highlighting are also available for readers with reading difficulties. Such applications are seen to enhance reading for students with LD or with VI. However, there are also high-priced programs like Kurzweil another text-to-speech program which can be a burden for low budgeted school environments. Instead of highly cost programs, the above mentioned text-to-speech standard equipment can be used via computers, laptops, mobile devices like smartphones, tablets and I Pads that are more accessible at a low cost [20].

Present study focuses on the special education teachers’ opinions regarding available assistive technology, their technology knowledge, utilized technology types and their empowerment of the assistive technologies that can be or is implemented and utilized by students with reading difficulties. Briefly, the study aims to determine the special education teachers’ opinions towards the available assistive technologies implementation for overcoming reading difficulties of their students.

## **2 Method**

The study, sought to determine the opinions of the special education teachers towards using assistive technology for the students with reading difficulties. The method is qualitative research method and semi-structured interview technique is used to collect data. Qualitative research is defined as a study in which the situations, perceptions and events are presented in holistic and realistic way in natural environments by using qualitative data collection methods such as observation, interview and document analysis. The semi-structured interview questions were prepared by the researchers and directed to the interviewees through a one-to-one interview [21] [22] [23].

### **2.1 Study group**

The semi-structured interview form was developed by the researchers and applied to special education teacher. While reporting the research, special teachers were given codes to be in line with the ethical principles. Since the identity of the participants is

based on confidentiality, the participants in the research report are coded as “Teacher 1”, “Teacher 2”, “Teacher 3” etc.

The study group of the research is selected among the special education teachers who are suitable for the research model, based on the purposive sampling method and selected with easily accessible case sampling. Purposeful sampling is a technique generally applied in qualitative research to identify and select in-depth information where limited resources are available. However, aim and sampling should be consistent [24]. The study group consisted of 10 teachers working in special education schools during fall semester of 2018-2019. The demographic characteristics of the participants in the study group consists of 8 female and 2 male special education teachers where, 4 of them are between 20-25 years, 3 of them are between 26-35 years and 3 of them are between 36-45 years.

It was determined that 8 of the teachers graduated from the intellectual disability, 1 teacher is from visually impaired, and 1 from Turkish language (master's degree in special education). Four of the teachers stated that they had master's degree in special education, 1 of them had PhD in special education and 1 of them had completed master's degree in visually impaired education.

Ten teachers reported to be working at the special education private schools. Special education teachers' opinions regarding the technological infrastructure sufficiency of the private special education schools teachers are working at, 3 of them considered it to be adequate, 3 of them didn't find it sufficient and 4 of them find it partially sufficient. Special education teachers' self-evaluation about technology skills 4 of them stated that the level of their technology skill is good, 3 of them stated to be moderate and the other 3 stated to be inadequate. Four of the special education teachers' stated that they considered themselves sufficient in utilizing and benefiting from assistive technologies, 2 of them didn't and 4 of them found themselves partially sufficient. All of the participating special education teachers stated that they all use the internet related to special education when planning in-class activities and also use assistive technology in the education of students with reading difficulties.

## **2.2 Data collection**

The data of the study is collected through a “semi-structured interview form developed by the researchers which also gives instructions on how to complete the form and also questions regarding their demographic features. Researchers developed the semi-structured interview form in line with the literature review and the aim of the study with expert opinions (two field experts). In order to check the clarity and clarity of the statements in the interview form, two special education teachers were pre-applied. The semi-structured interview forms validity and reliability was checked by implementing the form to 2 special education teachers as a pilot study.

Demographic feature questions in the interview form, consisted of teachers' gender, age, department of graduation, their last graduate program in higher education, technological opportunities of their private special education school, the level of their technology training, level of sufficiency in benefiting from assistive technologies, status of using the websites related to special education when planning in-class activi-

ties. In addition, 4 open ended questions given below were directed to special education teachers.

1. Do you use assistive technology in the education of students with reading difficulties? (For example, book marks, highlighting important parts of text, etc.)
2. Do you provide computer assisted (video, educational games, etc.) reading skills while improving your students reading difficulties? ( ) Yes No ( )
  - If your answer is yes, explain how?
  - If your answer is no, explain why?
3. Do you think assistive technology instructions improve the reading skills of students with reading difficulties? Yes ( ) No ( )
  - If your answer is yes, please give explanation
  - If your answer is no, please state your reasons
4. Do students develop self-confidence and positive attitudes towards reading skills with the assistive technology usage?

### 2.3 Data analysis

The data of the study were collected by making appointments with teachers and interviewers. The interviews took place in May 2019. Data were collected through one-to-one interviews when both researchers and teachers were available. The analysis of the data was started by categorizing the teachers' responds into themes without making any changes. The responds of the special education teachers were coded and categorized accordingly. Finally, the themes of the study were determined in the light of the data obtained. The frequency numbers were given in 4 different theme tables according to the special education teacher responses.

## 3 Findings

The findings of the of special education teachers’ opinions regarding the use of assistive technology in the special education of students with reading difficulties are presented below.

**Table 1.** Teachers' opinions regarding the use of assistive technology in the special education towards students with reading difficulties and the assistive technologies they utilize

Assistive Technology	Frequency
Tablet	5
Computer	6
Various Applications	3
Highlighter	3
Stickers, time line, video, smart board, projector, CD, voice recorder	7

Table 1 shows the use of assistive technology in the special education towards students with reading difficulties and the assistive technologies they utilize. As it can be seen from the above table, 10 teachers stated that they use various assistive technologies; computer and tablet usage are more frequently used.

For example, T2 quoted as “I mostly use tablets, computers and various applications in the education of students with reading difficulties”. Another teacher responded “I use tablets, computers, projections and CDs according to the subject we will study “(T6).

Three teachers stated that they used a highlighter to develop students reading skills. T5 “Generally I use more concrete objects as well as technology to upgrade reading skills”. In addition to highlighting the reading texts, I support them with visuals about the text.

**Table 2.** Teachers' opinions regarding the use of computer assisted technology and implementation in the special education towards students with reading difficulties

Implementations	Frequency
Increase font size on computer	2
Reading activities on the smart board	1
Watching video	4
Reading text on computer	3

When teachers' opinions regarding computer-assisted reading education, T8 stated that “We use computer-aided reading from music storytelling activities using slides. Another teacher said, I use the text on the computer according to the child's characteristics. I make them read from the computer, observe their development, correct the mistakes and I reinforce them.

Since we are in the digital age assistive technology materials are attractive. I use a smart board for completing a story, fluency in reading, filling in crosswords. ” (T4).

**Table 3.** Teachers' opinions on technology-assisted reading instruction on improving reading skills of students with reading difficulties

	Frequency
Yes, it improves	10
Facilitates teaching and saves time.	2
Provides persistence, motivates and attracts attention.	2

The teachers stated that technology-supported reading instruction improves the reading skills of students with reading difficulties. Furthermore, 4 teachers stated that technology-supported reading instruction facilitates teaching and saves time, 2 teachers stated that it provided persistence and attracted attention.

For example, “Today's students’ spend most of their time with their families at home in front of televisions and use tablets, phones. Reading forming stories with the help of assistive technology empowers persistency and attracts the attention of the students. (T10).

T6 quoted that “It improves, enhances concentration, can follow the use materials, Different effects / sound / gameplay will make students even more motivated and happy. It affects to develop reading skills. “The utilize assistive technologies supports the applied training, attracts attention and empowers persistency. (T7)”

**Table 4.** Teachers' opinions regarding the use of assistive technology in terms of developing self-efficacy, positive attitudes of the students’ with reading difficulties

	Frequency
It develops self-efficacy and positive attitudes for some students and not to others.	1
Develops self-efficacy	4
It's effective in developing positive attitudes towards reading.	5

Table 4 indicates that, teachers think that assistive technology usage develops students self-efficacy and positive attitudes towards reading. 4 teachers indicated that students develop self-efficacy. Likewise, T9 quoted as “Yes its supports. Inclusion of the student in using technology enhances learning in multidisciplinary areas. Another participating teacher “Nowadays, technology usage is important. For this reason utilization of technology for such skills enhances attitudes of the special needs children.” (T5)

One of the teacher’s (T8) “It develops self-efficacy and positive attitudes for some students and not to others.” Five teachers pinpointed that student’s self-efficacy and development of positive attitudes for reading is enhanced.

#### 4 Conclusion and Discussion

The majority of the teachers stated that the technological facilities of the private special education schools they work at are not sufficient. This finding of the study is in line with the findings of other studies [25]. Even though majority of the special education teachers didn’t find themselves sufficient in terms of technology skills four of them stated to be self-sufficient. Similar studies also indicate that lack of information is an important obstacle in the use of assistive technologies [26] [27] [28] [29].

While some of the teachers evaluated themselves as being self-sufficient and benefited from assistive technologies, the majority of them stated that they were not sufficient. In addition of the development of using assistive technologies, it is also important to consider the frequency and the degree of effectiveness in using assistive technologies in their classroom [30] [31]. The effective use of assistive technologies is closely related to the level of knowledge and equipment that special education teachers have about assistive technologies. One of the major handicapped regarding the use of assistive technologies is the lack of sufficient knowledge and equipment related to assistive technologies which makes them insufficient in using assistive technologies [32] [33] [34] [35] [36] [37]. In the literature, there are several published researches on the views and opinions of special education teachers about the use of assistive technologies [38] [27] [39] [32] [40] [41] [42].

It was concluded that the teachers who participated in the study both benefited from websites related to special education in planning classroom activities and also used assistive technology in teaching students with reading difficulties. Assistive technologies are frequently use by special education teachers who work with students affected by disability [43].

It was determined that special education teachers use assistive technology in the education of students with reading difficulties. One of the results reveals that teachers use computers and tablets intensively while teaching reading. When the literature is examined, tablet computers are seen to be used very frequently by individuals with normal development. However, it is the same with the students with special needs which does not separate them from normal develop students, they both find it interesting and useful tool [44] [45].

Teachers stated that they use different assistive technologies according to the subject they will teach. These technologies include tablet, computer, projector, CD, highlighter.

Another finding of the study is that while teachers develop reading skills they use computer-assisted reading instruction and the practical computer font enlarger, smart boards for reading activities, they use video related to the reading topics and they read texts on the computer. Different skills and concepts can be taught to individuals with special needs by using smart board. For example; Different kind of applications especially designed for individuals with different characteristics such as intellectual disability, autism spectrum disorder, hearing impairments or physical disability like making corrections for reading and writing errors by marking the text and changing the colour of the text. The use of these options makes it easy to read, write, draw pictures and use computers [46].

The teachers stated that technology-supported reading instruction improves the reading skills of students with reading difficulties. In the literature, it is stated that technology supported multimedia teaching materials contribute to students' literacy skills. In this context, when the literature is examined, it is seen that many studies support this view [47] [48] [49] [50] [51]. [52].

Technology-assisted instruction facilitates teaching reading, saves time, provides persistence and attracts attention. [53] stated that the use of computer-aided instruction in the first literacy instruction enables the teacher to use materials such as pictures, photographs, animations and songs very instantly and comfortably, thus enabling the lessons to be processed with richer materials. Another finding is that students' attention can be directed to the lesson faster and longer with computer-aided instruction, using visual materials and audio materials together with the educational games which students can participate learn faster and more permanently. Opinions of the teachers' regarding the use of assistive technology reveal that students with reading difficulties are more confident and develop positive attitudes towards reading. One teacher stated that the use of technology develops self-confidence and positive attitudes only for some students.

It is emphasized that the use of assistive technologies in literacy teaching is very important in the literature [54] [55] [56]. Some studies indicate that technology in-

creates the motivation of individuals with special needs who have reading difficulties [57] [41] [58] [59].

## 5 Recommendations

Schools can develop projects and receive support in providing and financial budgetary support for assistive technologies.

In future studies, the existing knowledge and skill levels of teachers about assistive technologies can be examined in more detail and trainings can be organized for teachers.

Larger scale of teacher participants working in special education schools in different regions. The competence of special education teachers towards the use of technology can be examined

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