

## The Views of Special Education Department Students on the Use of Assistive Technologies in Special Education

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**Abstract**—Assistive technologies are an important factor for individuals with special needs to benefit from educational services. The aim of this research is to determine the opinions and thoughts of special education students on the use of technologies. The study group of the research consisted of 41 teacher candidates studying in Cyprus and Russian universities in the special education department in their classes in the fall semester of the 2020–2021 academic year. With regard to the collection of research data, it aims to determine students' views with the 'Personal Information Form' developed by the researchers to determine the demographic characteristics of the research group and the 'Semi-Structured Interview Form' prepared by the researchers. The descriptive analysis method was used in the analysis of the data obtained from the interview questions. As a result of the research, special education teacher candidates' use of the assistive technologies is given in detail in the results section.

**Keywords**—university student, assistive technology, special education, university, education

### 1 Introduction

Technological developments are continuing rapidly till today. With the development of technology, technology has started to be used in educational environments. Assistive technologies are divided into three basic categories: low-tech, mid-tech and high-tech [8] [14] [15]. For example, blackboard, book holder etc. are low level tools; voice recorder, calculator etc. are intermediate tools; computer software, smart board etc. are high-level tools of assistive technologies. From the definition of assistive technology it can be understood that it is used to improve the competence of individuals affected by disability and to increase their quality of life; it is also used to enable

these individuals to overcome the difficulties they may encounter [14]. The concept of disability is a concept that requires special education.

'Students with disabilities' include children with special needs in activities of daily living, including self-care, education and social participation. For example, sight, hearing, physical, mental etc. Students with disabilities are generally different from others because of their physical and learning limitations [15] [16]. Positive research results on the use of technology in education necessitate testing the use of technology in the field of special education [39]. In order for individuals with special needs to benefit from the general education curriculum effectively, some instructional adaptations must be made in the school environment [3]. Assistive technologies are at the forefront of instructional adaptations [6]. It is seen that technology is also used in special education to increase the quality of life of individuals with special needs and to create productive learning environments for them [22]. The purpose of assistive technologies can be defined as all kinds of tools, services or methods used to contribute to the survival of individuals with special needs as independent individuals in the society, to enable them to benefit from educational services and to increase their quality of life [20].

The effectiveness of assistive technologies developed for education is important, as well as how often and how effectively teachers use assistive technologies in their classrooms [6] [34]. Providing and accepting the use of assistive technology are sources of many problems and concerns, such as user knowledge level, skills and attitudes, lack of evaluation process, ineffective planning, insufficient budget, complex use, limited time and lack of the number of assistive technology professionals especially in distance education fields [4] [5] [12] [25] [50] because assistive technologies contribute significantly to education. Assistive technologies are important in learning, developing self-confidence, being independent and achieving a high quality of life for people with special educational needs [31]. They also serve as key tools to ensure students' access to education.

Actively and independently participating in the educational process, interacting with peers and having control over them help students realise their own learning experiences [35]. Today, many teachers working in the field of special education use computers, Internet etc. in their classrooms [40]. Teachers use many assistive technologies including various assistive technology applications in order to support the daily life skills and academic success of students affected by disability [21]. The effective use of assistive technologies is closely related to how much information and equipment special education teachers have about assistive technologies. One of the biggest obstacles to the use of assistive technologies is the fact that teachers do not have sufficient knowledge and equipment about assistive technologies and accordingly they do not feel competent in using assistive technologies [1] [38].

With the introduction of technology into the educational environments, the teaching processes carried out in classroom environments began to be carried out with technology support [41]. Technology-supported educational environments aim to design instructional materials suitable for different learner characteristics. In addition, it enriches the teaching environments by adapting the methods and techniques used, thus serving to create easily accessible, effective and productive learning environ-

ments. In the planning of the teaching process with technology-supported learning environments, assistive technologies are employed to increase the motivation and success of the learner. Assistive technologies are special tools, services and methods used to individualise the education of individuals with special needs, to increase their independence and to improve their quality of life [31]. In other words, it is the use of any tool that allows individuals with disabilities to eliminate the difficulties they may encounter in education, professional, daily and social life, to develop their competencies and to make the most of their existing capacities [28] [42].

As a result, various studies have been conducted to examine the competencies, attitudes, opinions and perceptions of special education teachers towards assistive technologies. It has been determined that teachers have little (insufficient) knowledge [9] [48] [49] and limited knowledge [21] about assistive technologies, or they have no knowledge about it [2]. It clearly shows that the knowledge levels of teachers about assistive technologies are different from each other and are at various levels. It is seen that teachers generally have positive attitudes towards assistive technologies [17] [18]. In his study, Alkahtani [2] stated that a significant majority of the teachers participating in the research had a neutral attitude towards assistive technologies [43].

As a result of the literature review, it is seen that special education teachers' attitudes, competencies and perspectives towards assistive technologies are important. In some studies, it is stated that special education teachers have negative attitudes towards assistive technology and want to use it due to lack of using skills. With all these results, it is aimed to determine the opinions of future special education teachers in order to determine their use of assistive technologies in education and assistive technologies in their professional life in the future.

## **1.1 Purpose of the research**

The general aim of the research is to determine the opinions of the students studying in the special education department about assistive technologies in special education. For this purpose, answers were sought for the following sub-objectives:

1. Did you use assistive technologies in your core lessons? What technologies did you use?
2. What do you think are the advantages of assistive technologies?
3. What do you think are the disadvantages of assistive technologies?
4. What can be done to increase the effectiveness of the use of assistive technologies in special education?

## **2 Method**

### **2.1 Research design**

In this research, which aims to describe the theoretical and practical competencies of special education students in the use of assistive technologies in special education,

it was decided that the most appropriate research approach is the qualitative research approach, and the research was structured using the case study model, which is one of the qualitative research methods. A case study is an in-depth description and analysis of a particular event or limited system [27].

## **2.2 Research group**

The study group of this research consisted of 41 pre-service teachers studying at the universities of Cyprus and Russia in the fall semester of the 2020–2021 academic year. In this study, 41 teacher candidates studying in special education departments were selected through easily accessible sampling, which is one of the purposive sampling methods. This type of sampling is a very economical method that is widely used in the qualitative approach [37]. With this method, the researcher can form the group in which he wants to examine the subject in depth in accordance with the purpose of the study. Information about the participants. The demographic characteristics of the participants are as follows: 13 female and 12 male students from Russia, 9 female and 7 male students from Northern Cyprus. In the selection of the participants, a total of 41 students were included in the study through easily accessible sampling, which is one of the purposive sampling methods.

## **2.3 Data collection tools**

In this study, the data were obtained through a semi-structured interview form prepared by the researchers by consulting experts' opinions. For the semi-structured interview form, the questions were prepared in advance, but a certain degree of activity and freedom is provided to the participants. In order to test the effectiveness of the interview form in the research, pilot interviews were conducted with five students studying in five special education departments with a pre-application. During the interviews, questions that are not understood or incomplete statements were added.

The issues were reviewed again and the interview form was given its final form by taking experts' opinions again. Relevant interviews were audio-recorded with the knowledge and consent of the participants.

## **2.4 Data analysis**

The data obtained from the interview form prepared by the researchers were analysed by the content analysis method. In the analysis of the data, categorical analysis and frequency analysis techniques were used and analysed in content analysis types. In the categorical analysis process, the stages of coding the data, creating the themes, organising the themes, defining and interpreting the findings were carried out [13].

### 3 Findings

#### 3.1 Use of assistive technology in special education

The students of the special education department were asked whether they used assistive technologies in their lessons or not (Table 1). All of the students stated that they used assistive technologies in lessons. They stated that they used mobile phones (37), smart boards and computers (15), tablets (4), visual cards (4) and visual charts (1) as assistive technology.

**Table 1.** Use of assistive technologies

	<i>N</i>		<b>N</b>
Yes	41	Mobile phone	37
		Smart board	15
		Computer	15
		Tablet	4
		Visual cards	4
		Visual charts	1

Some of the students' opinions are as follows:

- 'We use technological tools for education in our lessons. I use my mobile phone while doing homework, researching and using educational applications. Technologically, we use the Kahoot application most in lessons. This programme gives us the opportunity to test what we have learned during the lesson'.
- 'Of course, we use assistive technologies. The smart board is one of the technological tools we have used. With the help of these boards, interaction in education is ensured by using various elements such as writing, sound, video and graphics together'.
- 'We use many assistive technological tools in education. The picture cards we prepared in our lesson on Autism attracted my attention the most. These cards are very simple and easily applicable materials. Visual cards can often be preferred in teaching the concepts of color, object, shape, contrast, recognition-discrimination, and communication skills. It is easy to prepare, easy to apply and very cheap in terms of cost'.

#### 3.2 Advantages of assistive technologies

The answers given to the students of the special education department regarding the advantages of assistive technologies reveal their perspectives (Table 2). Most of the advantages of assistive technologies have been stated by students as facilitating education. There are also students who say that it is an advantage for children in need of special education in individualising teaching while also facilitating teaching. In addition to these findings, there are also students who stated that children with special

education need increase their qualifications in order to provide equality with other individuals. Since the assistive technologies used in education appeal to all senses, there are also students who state that they learned by offering entertaining content.

**Table 2.** Advantages of assistive technologies

	N
Facilitating education	19
Individualising teaching	8
Increasing their competencies	7
Fun content	7
Developing communication skills	2

Some of the students' opinions were as follows:

- 'Technology supported learning environments facilitate the education process. Assistive technologies are very effective for individuals with special needs to support their vision, hearing, reading, writing, academic, social and communication skills and facilitate independent living skills. Assistive technologies support multimedia and interaction elements. When learning environments are organised with technology support, the learning process can be more active and enjoyable'.
- 'Those who cannot express themselves in the social environment can be more comfortable thanks to the assistive technological tools in the teaching process. It helps individuals develop expressive language skills. Individuals who cannot fully express themselves support their communication skills by offering alternative ways to express themselves. Thus, it can increase the self-confidence of individuals by making them feel more secure. It can be said that the negative emotions these individuals feel in social environments can be reduced by software programmes such as virtual reality'.

### 3.3 Disadvantages of assistive technologies

Special education department students were asked the disadvantages of assistive technologies used in education (Table 3). They answered that there is no suitable content topic as a disadvantage of assistive technologies. Likewise, the students stated that the cost of assistive technologies they will use can be expensive, which will create a disadvantageous situation. Students studying in the special education department stated that when assistive technology is wanted to be used, problems such as not having the appropriate internet, malfunctioning of the device and failure of the programme may occur.

Some of the students' opinions were as follows:

- 'The technological tools used in education are selected according to the content. There may be a situation where the technological tool we will use is not suitable for the content'.

- ‘There are many technological tools such as simulation, digital media, voice pencils. There are studies that these assistive technologies are especially effective in the education of people with disabilities. There are some that are very expensive in terms of cost’.
- ‘Auxiliary technological tools used during the education period may create some problems in the implementation process. Many problems may occur at the moment of the training, such as lack of internet, computer breakdown, digital cards failure, phone not opening the programme, and running out of charge of technological tools.

**Table 3.** Disadvantages of assistive technologies

	N
Appropriate content selection	18
Cost	16
Technical incompetence	7

### 3.4 Opinions on increasing the use of assistive technologies in special education

The answers given by the students of the special education department to the question of what can be done to increase the use of assistive technologies were that the number of courses should be increased (15) for technology-supported education in university department courses. The students stated that in the material design course, which is one of the department’s courses, application-oriented (12) trainings should be given on the content. It is also among their opinions that as future teacher candidates, they should receive training (14) on the use of technology.

## 4 Conclusion and discussion

It has been concluded that all of the students of the special education department benefit from this technology whether or not they use assistive technological tools in their lessons. When the answers of the students are examined, the items most of the students stated about the assistive technological tool consist of technology-based devices. They stated that they use mobile phones (37), smart boards and computers (15), tablets (4), visual cards (4) and visual charts (1) as assistive technology. According to this result, it can be said that the students do not have enough knowledge about assistive technologies. They listed only some of the many educational aids that can be used in education. Unlike computer programmes, the use is easy for users of almost any level. This potential of mobile applications makes them usable in educational processes [33] [44]. There are studies showing that mobile applications can be used effectively in special education [7] [29].

It has been concluded that students use assistive technologies mostly because they facilitate education: education of an individual. It is concluded that assistive technologies can be used to individualise teaching. There are students who stated that they

increased their qualifications in order to ensure equality with other individuals for children in need of special education. Since the assistive technologies used in education appeal to all senses, there are also students who state that they learned by offering entertaining content. With universal design and assistive technologies, it is possible to remove barriers in educational environments for the disadvantaged group and all individuals with special needs [8] [45]. It is the use of any tool that allows individuals with disabilities to eliminate the difficulties they may encounter in education, professional, daily and social life, to develop their competencies and to make maximum use of their existing capacities [28] [46]. The frequent use of tablet computers by individuals with normal development and the fact that they do not distinguish an individual with special needs from individuals with normal development [30] [33] make them stand out as an interesting and useful tool for individuals with different disabilities and special needs.

It is concluded that not being able to choose the appropriate material and content during the training period is a disadvantage. Likewise, the students stated that the cost of the assistive technologies they will use can be expensive, which will create a disadvantageous situation. Lack of internet, failure of the programme and corruption of the equipment also emerged as disadvantages.

Finally, when we look at the findings of the suggestions offered by the students of the special education department to increase the use of assistive technologies, they stated that the number of courses for technology-supported education in university department courses should be increased. The students stated that in the material design course, one of the department's courses, application-oriented training should be given on the content. It is among their opinions that as future teacher candidates, they should receive training on the use of technology. As a result, this literature review is consistent with the results obtained from similar studies. In the research findings examining the opinions of special education teachers on the use of technology, it has been determined that special education teachers need training and information on the use of assistive technologies, and that they cannot benefit from these technologies sufficiently due to the high cost of assistive technologies they use [1] [10] [11] [12] [32].

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