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Use of Assistive Technology in Special Education

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Abstract

It is known that there is a universal struggle for the education of students with special needs. While meeting the needs of these individuals, different models, methods and techniques are used. Although different methods are used, there are also obligations that should be used that are not different since common needs do not change. Education, development and motivation of students with special needs are the basic elements that cause this necessity. When the ages we live in are considered as the age of innovation, the developments in the field of information and technology are clearly felt in the field of education as well as in every field. The main purpose of this study is to investigate the requirements of the use of technology, which is digital support in the field of special education, which is one of the topics of education. It will be examined how the use of technology that can contribute to the development of special education students with special needs in inclusive and inclusive education is done in the current ages.

INTRODUCTION

All the needs of individuals with special needs, for which awareness has been raised recently, are shaped according to some characteristics of these individuals. Because each individual shows different individual characteristics when evaluated within some of their own characteristics. When these individual differences are examined and evaluated, it can be said that people with special needs should be approached with more importance and that these approaches should be the least

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consequential. This is primarily a need in technological fields. Technology, which has become a part of our daily life, has made itself felt in all areas of our lives, as well as in the education sector, thanks to the conveniences that technological developments have brought to our daily lives. The products offered by technological developments have been used on education for a long time.

Technology, especially platforms like social media, has become a powerful tool in shaping people's attention and actions. This can be used to promote a particular political view, market products, or encourage a certain behavior. However, depending on how this power is used and how its effects are assessed, it is debatable whether technology is a force for good. It is important for students to understand this power of technology and approach it from a critical perspective. In particular, it is important to question how well the content spread on social media is compatible with reality, to check sources to verify information, and to be conscious of recognizing manipulative tactics. It is important to provide students with training that helps them develop critical thinking skills and develop informed moral judgment about the effects of technology. This can enable them to use technology effectively, avoid manipulations, and approach societal issues sensitively (McDiarmid & Zhao, 2023).

During this process, the technology used in education has taken place in education in rapid change by developing and constantly renewing thanks to its positive feedback. With the rapidly changing technological developments, this use has been renewed day by day and has made itself an indispensable element of education. In line with these indispensable elements, the need for adaptation in education and training environments is also a great need in special education areas.

Today, instead of calling individuals "disabled", people with special needs or different abilities should be given more appropriate language. In particular, as you mentioned, special needs encompass a variety of situations, and people's life experiences can vary quite a bit. For example, one person may have a slow learning difficulty while another has extraordinary abilities, or a person with communication difficulties may excel in social-emotional skills. Therefore, it is important to recognize that each individual has different needs and abilities. This diversity requires the provision of appropriate support and resources for individuals to realize their full potential and participate fully in society. It is also important for society to be tolerant, respectful and inclusive of these differences. Therefore, the sensitivity of language to such differences can positively affect the way people define themselves and take part in society. That's why it's important to encourage people to express themselves using language that is appropriate to them, inclusive and responsive (Yuwono & Okech, 2021).

Kibuuka (2017; as cited in Yuwono & Okech, 2021) emphasizes the need to offer a variety of instruction and materials to suit students' different learning styles and needs. Visual aids and extended printed materials can support students' learning processes and help them overcome learning barriers.

Visual aids can be very effective, especially for students with visual learning styles. Graphs, charts,

tables, pictures, and other visual aids can embody abstract concepts and provide students with a better understanding of topics. Extended printed materials can be especially useful for students with special needs, such as vision or attention deficits. These materials may include presenting texts in enlarged text, audiobooks, or other alternative materials. Proper presentation of such materials in schools promotes equity and inclusion in education. Supporting each student in accordance with their needs enables them to succeed and realize their full potential. Therefore, it is important for schools to provide students with access to a variety of learning materials and adapt their teaching methods to meet the learning needs of students. This is a fundamental step to ensure fairness and equal opportunity in education.

The lack of experience in education and low digital capacity have become more pronounced, especially in recent years. This has resulted in schools not being able to keep up with digital transformation and provide students with an effective digital learning experience. With inequalities and learning losses increasing, it has become inevitable for schools to improve their digital capacity and preparedness. To deal with such outcomes, schools need to focus primarily on increasing their digital capacity. This includes enabling teachers to use digital tools effectively, providing students with digital skills, and strengthening the digital infrastructure on the management side. It is important for educational institutions to offer ongoing training and support to improve the digital skills of teachers and administrative staff. In addition, schools need to strengthen their technology infrastructure to increase their level of digitalization.

This includes steps such as improving internet access, providing computers and other digital tools, and offering technical support to students and teachers. For a successful digital transformation, schools need to encourage and continuously improve learning and experience. This means integrating digital technologies effectively, promoting student-centered learning approaches, and offering learning experiences that are tailored to students' needs and interests (Timotheou et al., 2023).

Information and Educational Technologies in Special Education

Special education is defined as a form of education specially prepared for individuals with different learning needs. In this context, as a result of the situation that occurs with different problems such as hearing and vision deficiency, speech difficulties, orthopedic deficiencies, mental retardation and nervous system problems, we encounter individuals who need special education. According to Balanskat et al. (2006), the impact of Information and Communication Technologies (ICT) on students' learning largely depends on the capacity of teachers to use these technologies efficiently for pedagogical purposes. In other words, the impact of technology tools on students' learning processes is directly proportional to teachers' ability to use these tools effectively for educational purposes.

All of the technologies that can support people in need of special education to continue their lives without being dependent on someone else are called assistive technologies. These semi-technological

products are used in all areas of life, as well as in classroom activities with the aim of developing, maintaining and increasing all the useful skills of the student.

It has been established that digital technologies are also one of the most important factors that can contribute to reducing existing social gaps and can be used to promote and support social inclusion and improve people's quality of life (url-1). For this reason, it has become very important to include technology tools and information and communicative technology products in the education process. The reason for this importance is; It is the fact that assistive technologies that can be used effectively offer situations that can make people's lives comfortable. The development of communicative skills and the development of social skills also develop positive situations that enable more participation in society. At the beginning of the main goals of the individual to be an individual, it emerges from the instinct to gain a place in the society by adapting to social environments, and the use of technology in positive fields and in the right places develops and supports this process.

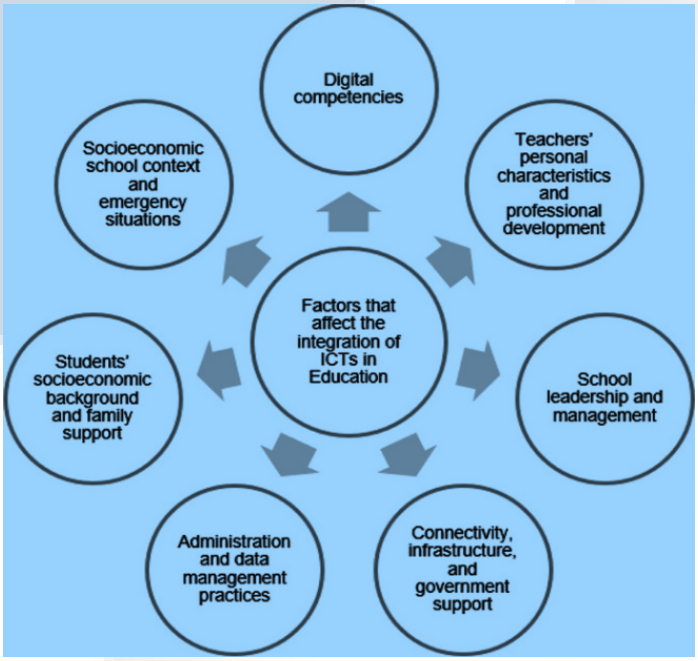

Figure 1. Factors that affect the impact of ICTs on education

Source: (Timotheou et al., 2023).

In this context, studies in the field of special education are one of the basic elements of our age, which should progress in a way that coincides with technology. Apart from these, the field of special education and technology should also be reflected as positive discrimination to all individuals. In order to achieve this situation, a number of universal designs are required.

The use of universal design (UDL) can help teachers proactively design lessons taking into account various student needs. UDL recognizes student diversity and encourages flexible structuring of

course materials, teaching methods, and assessment processes with this diversity in mind. In addition to designing courses taking into account the various characteristics and needs of students, the UDL also plays an important role in making course content accessible (Rao & Meo, 2016). These universal designs provide the opportunity to create a curriculum that is appropriate, modifiable or adaptable to the individual and makes it accessible to every person. The universal design will also offer flexible and adaptable opportunities for individuals who meet on the same educational ground but are different from each other. Based on these design opportunities, assistive technologies are the most basic factor in the use of each student within the existing curricula without ignoring their individual differences.

In the field of special education, a lot of technological materials are used thanks to the benefits of technological developments. While using materials that have been diversified thanks to technological developments, it can reduce the disadvantages of special education students against students receiving normal education by using materials developed specifically for special education. These tools, which facilitate the learning of students with special needs, develop and support the learning skills of special education students as assistive technology tools in education.

Repetition, which has an important place in the concept of learning and which special education students need even more frequently, has enabled the repetition to go further in terms of quality and quantity, thanks to assistive technologies. In addition, the concept of feedback is very important in this field. Thanks to these technological supports, learning is accelerated thanks to the increased feedback rate and the number according to the studies carried out. Problem-solving behaviors, which are another field, can be transformed into acquisitions and skills, and technological supports are also used depending on the ability of these individuals to focus their attention. Thanks to the ever-advancing developments in the field of information and technology, it makes great contributions to the ability of children with special needs to gain independent skills and self-confidence.

With digital technology in education, today's educational environment has changed for the better or developments. Digital learning is a learning strategy that leverages technology to fulfill the entire curriculum, allowing students to learn quickly and quickly (Oliver, 2005; Pacheo et al., 2018; as cited in Haleem et al., 2022:276). The digital classroom focuses entirely on teaching through the use of technology (Haleem et al., 2022).

In this context, although technology sometimes appears in negative meanings for students, it reduces the disadvantageous situations in the middle by relieving the lives of individuals with special needs by using technology correctly and appropriately for mass goals and purposes. Technological support, which is needed in the field of special education at a rate that is more than needed in the whole of education, will provide gains with the correct use of special education in all areas. In order to use information and communication technologies effectively and correctly, it is necessary to consider the

type and degree of disability of the student. After this situation is discovered, universal designs for similar individuals will begin to emerge with different usage areas of technology.

With the inclusion of technological products in the field of education, the studies carried out by educators have started to be educational studies that include technology support. It is expected that the environments where the training places are supported by technological equipment will be prepared at a level suitable for individuals who learn differently.

In addition, the conformity of elements such as techniques and methods used with these materials to these materials is ensured and the efficiency increases. In this case, both the student and the teacher take efficiency and spend the education in a more fun and more purposeful way. In other words, one of the most important factors that increase the success of the student is technologically supported learning. Thanks to these assistive technologies, the teaching methods of people with special needs are individualized and teaching methods that contribute to the increase of these individuals' ability to work on their own.

In this context, it is essential to use all technology-supported tools effectively, as people with deficiencies need to rapidly increase their own capacity scales in areas such as difficulties in education or situations they are likely to encounter in social life. These technological supporting tools differ from each other according to their level.

Low-Level Assistive Technologies

Symbolic tools in the form of pictures and cards: These are low-level assistive technologies that are used in many fields and support learning skills by supporting the development of perceiving skills and information containing concepts, and are used as ready-made picture or card-shaped tools that can be found in the form of very easy materials.

Visual charts: It appears in the form of charts that can be made ready in different forms consisting of tools expressed in the form of pictures or text, and can be organized at certain times. One of the problems frequently encountered by students with special needs needs is the difficulty of learning concepts that require academic skills, as well as the difficulty of using and following the planned activities within the existing organization. In this case, visual charts eliminate or minimize these disruptions. One of the most used in this area is activity charts. It guides the individual in need without help in the process of doing some activities.

Pen holder, adapted pen and worksheets: For those who have difficulty in motor skills, pen holding and writing, materials such as special intervals or tissue worksheets eliminate the inadequacy. It is one of the tools developed for these individuals who are behind in small muscle development.

Adapted scissors: Adaptive scissors, which have been developed for individuals who have difficulty in using cutting tools such as scissors in jobs that require manual skills, are one of the materials used.

Mid-Level Technologies

Timers:

Efficient use of time during a task that needs to be done is also an important issue. In students who need special education, timers are used as a tool that gives visual stimuli by planning this task in terms of time. These tools, which are very easy to use, can give audible warnings as well as visual stimuli. This mid-level technology seems to be used more frequently in individuals with learning disabilities, hyperactivity disorder or attention deficit.

Reading pens: These are the tools that visually present the words or sentences by scanning the text to be read, while simultaneously voicing them. It is one of the assistive technologies used especially by individuals with visual impairment.

Talking calculators: At a simple level, they are tools that perform calculations with voice control and inputs of number data. It supports the mathematics learning of students with attention disorders and learning difficulties.

Speaking dictionaries: These are tools that support the learning skills of people who have problems with spelling, the meaning of words, their antonyms and synonyms.

High-Level and Complex Technologies

Tablet computers: Both auditory and visual learning is one of the most effective learning methods. These tools, which are easy to use thanks to their touch panels, contribute to the learning of many disadvantaged individuals. The biggest advantages of this are: While reducing people to an individual method in learning, it also creates the opportunity to appeal to a large number of individuals. In addition, since this technological tool is very easy to take from one place to another, it can be carried anywhere and kept with it at any time.

Smartphones: Smartphones, which have become one of the whole areas of our lives and an integral part of our daily lives, are used by almost all individuals in social life. These smartphones are not only used in the field of communication, but also have many functional features. The fact that the new media environment includes many features has also increased the number of users rapidly.

Interactive boards: One of the tools that have been actively used in many education areas of the world, that is, in classrooms, is interactive boards known as smart boards. It includes tools that facilitate a lot of learning, such as writing, drawing, video media tools, audio, graphics, etc., which have visual presentations through these interactive boards. Since the learning needs and styles of students in need of special education are very different from each other, interactive boards, which include different learning styles, offer different learning models to these students and offer learning suitable for individual needs. In addition, unlimited resources can be accessed by ensuring the use of

interactive boards used in the classroom environment over internet networks.

The size and colors of the visuals on the interactive boards can be arranged in the most appropriate way for the individual, providing teaching in accordance with the needs. While giving instant feedback to the truths made can accelerate learning, on the other hand, it can facilitate learning by instantly changing the mistakes, options, colors and texts.

Virtual reality: Virtual reality, which allows it to be used effectively in every field, is an interactive and multimedia technology adapted to the computer system. Virtual reality is a limited environment that allows all visuals and animations in digital environments to be experienced as they are felt in a real world. Although virtual reality is still not on a sufficient scale in the education of children with special education needs, it will take its place among the most active assistive technological tools in the future.

Planning the Use of Assistive Technologies

Assistive technologies are used to offer different learning areas to students. Assistive technologies save time by using time effectively and efficiently, while trying to provide equal opportunities for children with special needs. In order to achieve these gains, an individualized and planned process is required in line with the needs. In the use of these auxiliary tools; While extracting the details of which individuals the vehicle equipment appeals to, the needs of the individuals who need support should also be determined. The usage areas of the vehicles should be determined spatially and used accordingly. Assistive technological tools should be classified in low, medium and complex ways, and monitoring, development and implementation steps should be created together with individual needs and the suitability of the vehicle for the target audience.

Benefits of Technology-Enabled Learning Environments

Learning with assistive technology contributes to less dependent or independent living skills when used in line with the needs of individuals with special needs and according to the types of needs of the tools. Although the assistive technological tools to be used to provide effective, fast and permanent learning also provide these effects in ordinary individuals, it will be beneficial for these individuals to use them more effectively in terms of providing equal opportunity in education for individuals with special needs.

Results

With the expansion of the use of technology in education life along with the technological developments in the world, the importance of technological tools and the necessity of their use in the digital revolution seem obvious. As this digital life enters education, the ease of reaching individuals

one by one has started to emerge. This ability to reach each individual individually is a requirement that is most needed in the field of special education. This aspect of technology also reveals the functionality of the supported learning model provided by the use of assistive technological tools for students with special needs. These tools should be used with a universal model for individuals with special needs. The use of assistive technological tools in line with basic principles, principles and needs facilitates the learning skills of students with special needs, while helping to achieve equal opportunity in education. It helps these individuals, who need the help of these assistive technological tools more, to overcome the difficulties they experience, to some extent. In order to continue their individual lives in the face of social life and to turn into individuals who get rid of being dependent on others, it is necessary to use assistive technological tools intensively in order to provide faster and more permanent learning in educational processes.

Assistive technology ranges from simple materials (such as adaptive pens, markers) to advanced technological tools (such as tablets, computers, virtual reality). The intensive use of assistive technological tools in special education for all processes from self-care skills to a successful academic life is one of the requirements of the age we live in.

Suggestions

Suggestions for the use of assistive technology for individuals studying in the field of special education can be listed as follows:

- To conduct research in order to benefit from the positive aspects of technology,
- To be able to identify simple, medium and complex tools in the use of this assistive technology and to learn their target audience,
- To prepare needs analyzes according to the learning needs of individuals with special needs and to make plans in line with these analyzes,
- Choosing assistive technologies that can be considered useful for people,
- To increase the usage skills of educators who will benefit from assistive technological tools through in-service trainings,
- In order to provide the targeted learning skills, people with special needs
- To develop or make suggestions for the auxiliary tools that will be needed,
- For individuals who need special education, to classify the tools used in different areas of disability, to use experts to develop the right strategy and to plan,
- To raise awareness of assistive tools that support special education in all segments of society.

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