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Empowering Education for Students with Learning Difficulties and Disabilities: A Faculty and Student Perspective on the Utilization of Assistive Technology at the Academic Arab College of Education in Haifa

Nadia Ghalia[1,], Darawsheh Ahlam[1] and Eyal Isami[2]*

[1]Department of Education and Pedagogy, The Academic Arab College of Education in Haifa.
[2]Education and Sociology, The Academic Arab College for Education in Haifa.

Abstract: This study aimed to investigate the current usage of electronic educational technology by educators in the context of teaching students with learning difficulties and disabilities at Haifa University. The research employed a qualitative analysis approach, utilizing the SAS software for both the analysis of questionnaire responses provided by academic staff and the coding of interview data. The interviewees included 40 students who represented various disabilities within the university and 20 academic professionals from the Department of Special Education. The study's results indicated a consensus among respondents that the provision of assistive technology in the university significantly enhances the learning experience for students with disabilities. This enhancement is seen through increased motivation and readiness to engage in learning. Additionally, university students with disabilities generally exhibit a positive attitude towards integration, with various forms of assistive technology playing a crucial role in facilitating this process. These technologies empower them to interact effectively within the academic and social communities. However, despite the numerous facilities and services provided by at the Academic Arab College of Education in Haifa, challenges persist for students with disabilities. Some specific challenges are encountered, notably by individuals with visual impairments. These challenges include the limited efficiency of screen reader-equipped devices for the blind and issues related to the quality of magnification tools. In light of these findings, this study formulates several recommendations and suggestions to improve the current situation.

Keywords: Assistive technology, students with learning difficulties, higher education, Haifa, interview, questionnaire.

1 Introduction

The issue of educating individuals with special needs is one of the most significant and multifaceted social, educational, economic, and political issues on both local and global educational landscapes. It has gained the attention and concern of various societies due to a multitude of diverse factors and variables, including philosophical, legislative, cognitive, medical, technological, and others that extend to every aspect of life. The societal view of individuals with special needs has evolved through various stages, ranging from misunderstanding associated with violence, contempt, or exclusion, to isolation within shelters and care institutions driven by compassion to meet their basic needs. Then, it transitioned towards recognizing their rights to healthcare, education, social support, and rehabilitation. Subsequently, a new philosophy emerged based on integration, inclusion, normalization, and the call to provide these children with opportunities for care and education equal to those of typical children (Ng et al., 2018).

It is well-known that the renowned mathematician Einstein faced significant challenges in language acquisition, not beginning to speak until the age of three. By the age of seven, he was forming sentences silently before speaking them aloud. However, he had mastered differential and integral calculus (a branch of mathematics) by the age of fifteen. The life stories of Einstein and many other scholars and celebrities emphasize that any difficulties students encounter in certain areas do not necessarily preclude their potential for excellence in other fields, especially when these difficulties are

*Corresponding author e-mail: nadihgali@gmail.com

addressed appropriately. It is essential to emphasize that students with learning difficulties are not intellectually disabled, but rather they typically possess normal or above-average intelligence. They may also excel in areas such as music, art, mathematics, and more. Furthermore, they are not physically disabled, as they do not differ from other students in their visual or auditory capabilities, and they do not experience emotional disturbances. What these students require is increased care, attention, appropriate teaching methods, and specialized educational tools (Yenduri et al., 2023).

Technology, in all its forms, represents a valuable resource for developing suitable solutions to overcome the educational challenges faced by students with learning difficulties. It helps reduce their psychological stress and anxiety by providing entertaining programs and games that bring joy and delight to their lives. Studies have also indicated the effectiveness of technology in addressing various behavioral and psychological problems among students with learning difficulties, contributing to the reduction of hyperactive behavior and improvement in accompanying behaviors, such as attention and enthusiasm. This research discusses the role of technology in the learning of students with learning difficulties (Krämer et al., 2021).

Assistive technology in education is a powerful tool that contributes to enhancing learning opportunities and skill development for children with learning difficulties and students with disabilities at universities. This technology is considered an innovative and effective means to overcome the educational challenges faced by these students, providing equal learning opportunities and academic success.

From the perspective of teachers, the use of assistive technology is a valuable tool that allows them to customize lessons according to each student's needs. This technology provides diverse and appropriate educational content and offers innovative and interactive teaching methods, such as interactive educational software and educational games, which capture students' attention and stimulate their learning. Additionally, assistive technology offers assessment and progress tracking tools that enable teachers to analyze student performance and provide additional assistance as needed. For students, assistive technology represents a means to interact and participate in the learning process independently and in a manner suitable for their abilities. This technology enhances self-confidence and motivates students to overcome their difficulties and achieve their full potential. Assistive technology also provides user-friendly interactive interfaces that help students learn in ways that suit their specific learning styles, whether it's through self-reading, auditory learning, or sensory interaction (Abidin et al., 2023; Krämer et al., 2021; Rodríguez-Cano et al., 2022). However, there are challenges and obstacles that hinder the use of assistive technology in the education of students with learning difficulties and students with disabilities at universities. These obstacles may include financial and technological limitations, as well as the need for specialized and advanced technology to meet students' unique needs. Additionally, teachers may face challenges in dealing with new technology, adapting it, and effectively integrating it into the educational process.

To fully realize the benefits of using assistive technology in the education of students with learning difficulties and students with disabilities at universities, appropriate training and support for teachers are essential. Providing the necessary infrastructure and resources for assistive technology is also crucial. Collaboration and coordination between teachers, universities, and specialists in assistive technology are required to maximize the benefits of this technology and empower students to achieve their academic and personal success.

1.1 Study Problem:

This study aims to uncover the reality of using assistive technology for students with disabilities. The Academic Arab College of Education in Haifa provides assistive technological services and tools to support students with disabilities. They also train these students on using these tools to assist them in all aspects of their education and learning. These services are offered through a dedicated department for students with disabilities, which includes a unit specialized in assistive technology. The department is keen on providing each student with the appropriate assistive technology device according to their specific disability. Furthermore, this department prepares and customizes electronic curricula and references to suit the nature of each student's disability. Despite the provision of technological support for these students, the issue lies in effectively utilizing these tools by incorporating suitable software that aids integration into the educational process. This challenge is particularly unclear because faculty members at the university often lack the necessary skills to assist students with disabilities in effectively employing these technologies. Each disability comes with specific requirements and technological innovations related to its type, degree, and nature.

Among the problems facing the learning process for children with learning difficulties and students with disabilities at universities, some major challenges can be mentioned:

1. Lack of Resources: Many teachers and universities face a shortage of resources to provide assistive technology and the necessary training to use it effectively. These resources may relate to both hardware and software or the qualification and training of teachers.
2. Lack of Awareness and Training: Teachers may face difficulty in dealing with assistive technology and integrating it into the educational process due to a lack of awareness and training. Teachers may require ongoing training and support to fully benefit from the potential of assistive technology.

3. Compatibility and Adaptability: Assistive technology may face challenges in accommodating diverse needs of students and their individual learning difficulties. Technology should be designed to meet various requirements, such as auditory, visual, and motor learning.

4. Communication and Interaction Issues: Some students may have difficulty in communicating and interacting with assistive technology due to language difficulties or limited sensory abilities. Technological tools may need adaptation to provide user-friendly interfaces that support communication.

5. Technical Challenges: Assistive technology may encounter technical challenges, such as signal strength and wireless connectivity stability. Regular maintenance and updates may be necessary to ensure optimal performance.

These challenges pose real obstacles to achieving comprehensive and effective education for children with learning difficulties and students with disabilities at universities. However, by appropriately using assistive technology and providing the necessary resources and continuous training, significant progress can be made in improving the learning process and empowering these students to achieve their full potential. The purpose of this study is to explore the use of assistive technology provided to students with disabilities and to what extent it is employed in their education. The study also aims to discover the students' preferences for the services provided to them and their opinions regarding the quality and effectiveness of these services, which will aid in integrating students with disabilities into the educational process.

1.2 Research Questions:

The study poses the following main question:
What is the extent of the use of assistive technology in the education of children with learning difficulties and disabilities from the perspective of both teachers and representative students with various disabilities at the university?

This main question branches into the following sub-questions:

1. **Extent of Use and Advantages**: "What is the extent of assistive technology use in the education of students with learning difficulties at the university, and what are its main advantages for both teaching and learning processes?"

2. **Selection and Real-World Application**: "How is the most suitable assistive technology determined for students with disabilities, and what is the current real-world application of these technologies from the students' perspective?"

3. **Student Preferences and Challenges**: "What are the preferences of students with learning difficulties regarding assistive technology services, and what challenges do they encounter in using these technologies?"

4. **Teacher Perspectives and Curriculum Integration**: "How do teachers specializing in Specific Learning Disabilities perceive the role of assistive technology in their profession, specifically in integrating it into curricula for inclusive environments?"

5. **Correlation of Teacher Beliefs and Professionalism**: "Is there a relationship between SLD teachers' beliefs about the availability and importance of assistive technology and their sense of professionalism?"

1.3 Study Objectives:

The objective of this study is to explore and understand the use of assistive technology in the education of students with learning difficulties and students with disabilities at universities, from the perspectives of both teachers and students representing various types of disabilities. The study aims to achieve the following objectives:

1. Understanding Teacher Perspectives: The research aims to explore the opinions and experiences of teachers in using assistive technology in education, identifying the challenges and advantages they encounter. Teachers will be interviewed to understand their acceptance of assistive technology and its impact on student performance and the learning process.

2. Exploring Student Experiences: The study will survey the opinions and experiences of students with learning difficulties and students with disabilities representing various types of disabilities regarding the use of assistive technology in their learning. The impact of assistive technology on enhancing their learning abilities and its alignment with their individual needs will be analyzed.

3. Identifying Advantages and Benefits: The results will be analyzed to determine the potential benefits and advantages of using assistive technology in the education of children with learning difficulties and students with disabilities at universities. Emphasis will be placed on improving access to knowledge, promoting inclusivity and interaction, enhancing self-confidence, and academic skills.

4. Identifying Challenges and Barriers: The study will identify the challenges and barriers faced by teachers and students in using assistive technology. This knowledge will help identify needs and improve the utilization of assistive technology and provide the necessary support to overcome these obstacles.

5. Providing Recommendations: Practical and tangible recommendations will be presented to teachers and universities on how to enhance the use of assistive technology in the education of children with learning difficulties and students with disabilities. These recommendations will focus on improving training, providing resources, and enhancing communication and collaboration among teachers, students, universities, and assistive technology specialists.

1.4 Theoretical Significance of the Study:

The study on the use of assistive technology in the education of children with learning difficulties and students with disabilities at universities holds significant theoretical importance. Here are some key aspects of its theoretical significance:

1. Advancing Scientific Knowledge: Through this study, it contributes to expanding scientific knowledge about the use of assistive technology in the education of children with learning difficulties and students with disabilities. The research enhances the understanding of the benefits and challenges of this technology and its impact on students' educational and social performance.

2. Guiding Policies and Practices: The study helps guide and improve educational policies and practices regarding the use of assistive technology. Based on the study's findings, recommendations and guidelines can be developed for universities, schools, and educational authorities to enhance the effective and efficient use of assistive technology.

3. Improving Educational Effectiveness: The research contributes to improving the effectiveness of education for children with learning difficulties and students with disabilities. By understanding how assistive technology can support the learning process and enhance student participation and skill development, the quality of education can be improved, and academic and personal success opportunities can be enhanced for these students.

4. Enhancing Assistive Technology: The study contributes to the promotion and improvement of assistive technology itself. By identifying challenges and barriers and providing recommendations for future development, assistive technology can be enhanced in design and effectiveness to better meet students' needs.

In general, this research contributes to a better understanding of the benefits of using assistive technology in the education of children with learning difficulties and students with disabilities and works to improve education and technology to support all students in realizing their full potential.

1.5 Study Limitations:

The study discusses the objective limitations of the study. The current study is limited to the following objective boundaries:

- The use of assistive technology by students with disabilities.
- Specifically addressing the use of assistive technology.
- The types of communication using assistive technology.
- The inclinations of individuals with disabilities toward inclusion in education.
- The role of the Academic Arab College of Education in Haifa in providing assistive technology for the learning of students with disabilities.

1. **Geographic Limitations:** The study was conducted at the Academic Arab College of Education in Haifa.
2. **Human Boundaries:** The study's focus was on a purposive sample consisting of 40 students with mobility and visual impairments from different academic years and 20 academic staff members at the Academic Arab College of Education in Haifa.
3. **Time Boundaries:** The study was conducted between February and April 2023.

These objective, geographic, human, and temporal boundaries delineate the scope of the study, focusing on the use of assistive technology at the Academic Arab College of Education in Haifa from the perspectives of students with disabilities and academic staff during the specified time frame.

1.6 study terms and operational definitions:

1. Assistive Technology: The use of technology and technical tools to enhance the capabilities of individuals with disabilities, helping them overcome challenges, achieve independence, and fully participate in society.

2. Learning Disabilities: Refers to the personal and learning difficulties that individuals face in acquiring and developing fundamental academic skills, such as reading, writing, and mathematics.
3. Disability: Refers to a condition in which an individual is physically, mentally, auditorily, visually, sensually, or kinetically impaired, affecting their abilities and hindering them in performing certain activities of daily life.
4. Students Representing All Disabilities: Encompasses a diverse group of students representing various types of disabilities, such as physical disabilities, hearing impairments, visual impairments, learning disabilities, autism, and others.
5. Teachers' Perspectives: Expresses the opinions and experiences of teachers regarding assistive technology and its use in educating students with learning difficulties and disabilities.
6. Challenges and Barriers: Refers to the difficulties and potential factors that teachers and students may face in using assistive technology, such as lack of training, inadequate resources, and non-alignment with students' needs.

1.7 Paper organization

 The paper comprises several sections. Section 1 encompasses the introduction, main objective, and motivation of the study. Section 2 delves into Theoretical Framework; Section 3 covers the related work in the field. The research methodology is detailed in Section 5, which was previously referred to as Section 3. The results and discussions are presented in Section 6, and finally, Section 7 provides the conclusion.

2 Theoretical Frameworks

Technology, in all its forms, represents a vital channel for developing appropriate solutions for students experiencing learning difficulties. This technology can help overcome numerous obstacles in their learning journey, thereby reducing their psychological stress and anxiety. Through the provision of entertaining programs and enjoyable games, technology can bring joy and happiness into their lives. Studies have indicated the effectiveness of technology in addressing various behavioral and psychological problems among students with learning difficulties. It also contributes to reducing hyperactive behaviors and improving associated behaviors such as distraction, impulsivity, and hyperactivity. This chapter discusses the role of technology in the learning process for students with learning difficulties (Rodríguez-Cano et al., 2022).

Recent years have witnessed significant advancements in information technology and communication, encompassing various media and tools. This progress has significantly aided the integration of technology into various aspects of life, whether for the general public or individuals with disabilities. Disabilities may include physical, visual, hearing, and other impairments that can hinder people from performing their tasks and responsibilities. However, these technological tools are not merely for use but also serve to enable the integration of people with disabilities, providing them equal opportunities as individuals with shared characteristics. They, like others, require interaction with their surrounding environment. Hence, the use of modern technology in their education and support is crucial for the integration of disabled individuals into social activities in general and education in particular(Bahar et al., 2021).

Assistive technology serves as an effective means to assist students with disabilities and others in accessing their education and providing them with the necessary educational aids. Nevertheless, teachers are often inadequately prepared during their pre-service period and throughout their continuous professional development to cater to the technological needs of students with disabilities. This deprives these students of the opportunity to access technology, especially given the limited availability and high costs. Both Microsoft and Apple operating systems on computers and mobile devices include built-in assistive technology features that are easily accessible and usable. These integrated technological features can help teachers familiarize themselves with technology and assist students with sensory, physical, and educational impairments. They may have practical applications in the general design of learning (Koch, 2017). Therefore, many studies have shed light on the use of assistive technology in higher education, including universities and colleges, by students with disabilities.

For example, in 1988, the U.S. Congress recognized assistive technology as a practical need for individuals with disabilities when it passed the Technology Act. This legislation, which was reauthorized in 1994, led to the development of numerous programs and services that assisted people with disabilities in accessing and using information technology devices. In 1988, Congress enacted the Technology Act, which provided funding to the states for the development of an effective system for delivering assistive technology services to individuals of all ages and all disabilities. The Technology Act was reauthorized in 1994 and required government technology projects to remove systemic barriers to the timely acquisition and use of assistive technology devices and services (B. R. Bryant & Seay, 2020) (Al Masa'deh, 2020) pointed out several difficulties that many students with disabilities face in most Arab countries, hindering their pursuit of higher education. These challenges include the absence of supportive infrastructure in universities, insufficient funding for necessary modifications to facilities, and the lack of suitable educational materials for people with disabilities.

In summary, technology plays a significant role in addressing the educational needs of students with learning difficulties and disabilities, promoting their integration, and enhancing their educational experience. The use of assistive technology in education has the potential to alleviate various barriers, provided there is adequate teacher training and accessibility to these tools and resources.

2.1 Using Assistive Technology in Teaching Children with Learning Difficulties:

Technology plays a crucial role in developing visual perceptual skills for students facing learning difficulties. It achieves this through enhancing skills such as visual discrimination (similar and different), visual memory (short-term and long-term), and visual-motor coordination (coordination between hand-mouse movement and screen drawing). Technology also contributes to the development of auditory perceptual skills by improving auditory discrimination (distinguishing sounds, people, and animals, for example) and enhancing auditory memory and sequencing (auditory activities). Computer-based technology offers a plethora of software programs that help overcome writing difficulties for students with learning difficulties. For instance, word processing software allows for easy and convenient text modifications. Sentence construction programs assist in spelling review, speech structure, word prediction, grammar review, and style.

The use of technological resources in the lives of students with learning difficulties brings several positive outcomes, whether they are psychological, academic, social, or economic. Many studies have shown that the use of certain educational tools, such as computers, can significantly reduce stress. There are various entertaining programs and games designed to bring joy and happiness to these students, thus alleviating much of their psychological tension and anxiety. Many teachers employ this approach as a positive or negative reinforcement to modify student behavior.

Numerous local and international studies have demonstrated the effectiveness of educational tools in addressing various behavioral and psychological issues among students with special needs.

In summary, the incorporation of technology into the education of students with learning difficulties has a substantial impact on the development of perceptual skills, the alleviation of writing difficulties, and the overall improvement of the academic, emotional, social, and economic well-being of these students.

2.2 Advantages of Information and Communication Technology in Teaching and Learning for Students with Learning Difficulties:

Assistive Technology (AT) is any device that helps learners with disabilities complete daily tasks. An AT tool is any item used to maintain or enhance a child's disabled or improved performance. These tools can range from complex devices like communication devices to simple tools like recording devices. For instance, if a person has physical disabilities, a remote control can act as an assistive technology tool. Similarly, glasses or magnifiers can serve as assistive technology for individuals with visual impairments ("Success Coll. Students with Learn. Disabil.," 1993).

Researchers also claim that Information and Communication Technology has the potential to enhance inclusive education. (Roulstone, 2005; Sheehy, 2005) states, "Using Information and Communication Technology in responding to special educational needs opens up new opportunities for participation and integration in the culture, curriculum, and school communities" (p. 9). It argues that technology can bridge the gaps among learners, leveling the playing field for all students in terms of learning and access to curricula.

Abbot introduced the term "electronic inclusion" for the use of digital technologies to enable inclusive learning practices. Abbott suggests three categories for using Information and Communication Technology for electronic inclusion: 1) for training or practice, 2) for learning support, and 3) for learning enablement. The first category represents traditional use of information and communication technology, such as software. The second category refers to assistive technology, usually used to compensate for physical disabilities or difficulties. The first two categories seem to focus more on technology than on learning, whereas the last category assigns a humbler but more complex role to technology in electronic inclusion. Abbott stresses that using technology for learning enablement "highlights the need for attention by teachers and others in configuring conditions that digital technologies can be appropriately and effectively used to support electronic inclusion practices" (p. 20).

(Anagnostopoulou et al., 2021) The utilization of technology in aiding children with learning difficulties is notably impactful. It not only boosts their academic performance in core areas like writing, reading, math, and spelling, but also improves their organizational skills and social integration. For instance, assistive technology has proven to be a crucial aid in writing for children with learning difficulties, who often find this task challenging. This technology, when integrated into classroom activities, can significantly enhance students' performance, particularly in writing.

Key to this success is the collaboration between classroom teachers and specialists in assistive technology. This partnership is essential for the effective incorporation of such technologies into educational practices. The principles guiding this integration include:

1. Assistive technology augments basic skills and forms a part of the overall teaching strategy, aiding in the instruction of fundamental competencies.
2. For children with disabilities, assistive technology is not merely an educational aid but a vital tool akin to paper and pencil for their non-disabled peers.
3. It enables these children to access standard educational tools, complete tasks, and participate on an equal footing in conventional learning settings.
4. The mere presence of assistive technology doesn't automatically render educational programs or tools accessible or functional.

A thorough assessment by a specialist acquainted with both standard and assistive technologies is necessary to determine a child's need for such devices and services, which should then be integrated into their educational plans.

The evaluation of assistive technology must be a continuous process.

Adherence to these principles can significantly foster the independence of children with learning difficulties, reducing their dependence on others such as parents, siblings, friends, and teachers. This independence is crucial for their self-esteem and transition into adulthood. (World Health Organization, n.d.).

However, practical research on the use of information and communication technology for students with disabilities is lacking, both in Norway and internationally. Based on the limited existing research, it can be said that although digital technology has opened up new opportunities for participation and learning, schools have so far been unable to harness digital technology to achieve a more inclusive education. However, Norwegian teachers are positively inclined toward information and communication technology. For example, the majority of Norwegian teachers in the seventh and ninth grades agree that the use of information and communication technology enhances reading, writing, and collaboration, with over 80% agreeing that the use of information and communication technology facilitates differentiated teaching. However, the semi-annual assessment reports issued by the Information and Communication Technology Center do not study "the use of information and communication technology for inclusion," which is understood to be comprehensive arrangements for students with disabilities/special needs. The World Health Organization has also pointed out that through this technology, opportunities for participation in the community are increased, and barriers that hinder or reduce participation are removed. Since the 1960s, it has been suggested that technology helps increase the participation and integration of disabled learners, both inside and outside the school (Abidin et al., 2023; World Health Organization, n.d.). The use of new technology may also have negative effects. Some learners receiving special education feel ashamed when using technological means designed for people with disabilities. These learners prefer to use the same technology as the rest of the class.

2.3 Types of Assistive Technology for Individuals with Learning Difficulties

Assistive technology refers to devices and services used to enhance or improve the capabilities of learners with disabilities (et al., 2012). While the term assistive technology may make us think of computers and digital devices, it can also be low-tech, such as plastic pencil grips that slide onto a pencil. Assistive technology includes computer programs and tablet applications that help learners with learning difficulties with tasks such as converting text to speech (Kurzweil 3000), converting speech to text, and word prediction capabilities. Assistive technology has a significant impact on helping learners with disabilities progress toward their individualized education plan (Watson, Ito, Smith, Anderson, 2010). It can assist learners in two ways: by helping them learn how to complete tasks and by helping them overcome areas of difficulty. Assistive technology (AT) can address various types of learning difficulties. For example, a child who struggles with writing can use a special program to spell out their words, which is then converted into text. Similarly, a child with mathematical challenges can use a handheld calculator to keep track of results while playing games with friends. A teenager with reading difficulties can benefit from AT that reads aloud from the textbook. A child who cannot speak may participate in class using a communication board. Furthermore, a child with learning disabilities might need computer programs to improve their reading skills. AT is typically applied to computers, electronic tools, and software, helping children with learning difficulties in listening, mathematics, organization, memory, reading, and writing.

- Listening:Some assistive technology tools can aid individuals who struggle with processing and remembering spoken language. These devices can be used in various settings, such as in a classroom lecture or during meetings with multiple speakers.
- Mathematics: Assistive technology tools for mathematics are designed to assist individuals with challenges related to computation, organization, copying math problems onto paper, and providing visual or auditory support.
- Organization and Memory: Assistive technology tools can help individuals plan, organize, track calendars, to-do lists, contact information, and various notes. These tools manage information storage and retrieval using specialized software and mobile devices.

- Reading: A wide range of assistive technology tools is available to aid individuals with reading difficulties. While each type of tool functions slightly differently, they all assist by presenting text as speech, making decoding and comprehension easier.
- Writing: A wide array of assistive technology tools is available to help students who have difficulties with writing. Some of these tools help students analyze the actual writing task, while others assist with spelling, punctuation, grammar, word usage, and organization.

2.4 Types of Available Assistive Technology Tools

Assistive technology (AT) encompasses a wide range of tools designed to support children with learning disabilities. These tools are commonly associated with computer devices and software, but they are increasingly accessible online. Some of the AT tools that aid children with learning difficulties include:

1. Alternative Keyboards: Programmable keyboards with specialized layouts that reduce choices and include graphics for enhanced understanding, benefiting learners who struggle with writing or learning difficulties.
2. Audio Books and Publications: Recorded books allow users to listen to the text in various formats, such as audiobooks, CDs, and MP3 downloads. Users can navigate pages, chapters, and bookmark sections for ease of reference.
3. Electronic Math Worksheets: These programs assist users in organizing and solving math problems on a computer screen, with some systems offering high-volume speech output to help users who face challenges with pencil-and-paper math.
4. Free Database Software: These tools are used alongside word processors and other software, allowing users to create and store electronic notes. Users can "tag" relevant information on various topics and retrieve it later by typing any part of the original note.
5. Graphic Organizers and Planning Software: These applications assist users in organizing information and outlining projects when they have difficulty managing information or creating an initial written project.
6. Information/Data Managers: This tool aids users in planning, organizing, storing, and retrieving calendar entries, task lists, contact information, and other data in electronic form.
7. Optical Character Recognition (OCR): This technology allows users to scan printed materials into a computer, and then text-to-speech software or screen reading systems can read the scanned text out loud. OCR is available as standalone units, computer software, and pocket-sized handheld devices.
8. Personal FM Listening Systems: A personal FM listening system transmits a speaker's voice directly to the user's ear, helping them focus on the speaker. The system comprises a wireless transmitter (with a microphone) and a receiver (with an earpiece) worn by the listener.
9. Portable Word Processors: These lightweight, portable word processors are helpful for students who find writing by hand challenging. These word processors enable users to edit and correct their written work more efficiently than manual writing.
10. Spell Checkers: These are used by students who struggle with spelling, punctuation, grammar, word choice, and sentence structure. The software, often integrated into word processing systems, scans word processing documents and alerts users to potential errors.
11. Speech Recognition Software: Used in conjunction with word processors, this software allows users to "dictate" into a microphone. The spoken words appear on the computer screen as text, assisting users whose oral language skills are stronger than their writing abilities.
12. Speech Synthesizers/Screen Readers: These systems display and read text aloud on a computer screen, including text written by the user or scanned from printed material (e.g., books and documents), or text found online.
13. odern Talking Calculators: Talking calculators have a built-in speech module that audibly reads each number, symbol, or operation key pressed by the user, providing auditory feedback to verify the accuracy of entries before recording results.
14. Talking Spell Checkers and Electronic Dictionaries: These tools help correct spelling errors while writing and provide definitions, helping users who struggle with spelling and language accuracy.

These AT tools offer valuable support for individuals with learning difficulties, catering to various needs and preferences while facilitating learning and communication.

2.5 Selecting the Right Assistive Technology for Students with Learning Disabilities and Dyslexia

Assistive technology plays a crucial role in creating equitable learning environments, particularly in classrooms with a diverse range of learners. It acts as an equalizer, enabling access to learning opportunities that might otherwise be

unattainable for students with disabilities. These technologies are particularly vital in settings where teachers face the challenge of addressing various disabilities within a single classroom. By integrating assistive technology, educators can customize their teaching methods and enhance individual learning skills. This approach is especially beneficial for children with learning disabilities or dyslexia, who often grow up interacting with technology such as tablets. In many cases, these children may have a better understanding of certain devices than even their teachers, having used technology-based games from a young age. Rufus Olanrewaju ADEBISI's academic study, "Teaching and Supporting Children with Learning Difficulties" (2015), highlights the vast array of assistive technologies available in stores and online. These tools are accessible for both educators and parents. However, selecting the appropriate technology for children with learning difficulties is not straightforward. It requires careful consideration of the specific needs and abilities of each child to ensure that the chosen technology effectively supports their learning process. This personalized approach is key to maximizing the benefits of assistive technologies in educational settings (Anagnostopoulou et al., 2021) explained in his book about the extent to which information and communication technology supports the inclusion in the education of students with learning difficulties. This study highlighted the benefits and answered why assistive technology is used for children with learning difficulties. The study discussed various types of assistive technology devices designed and used to address issues related to written language, reading, listening, memory, and mathematics for students with learning difficulties.

(Kazanopoulos et al., 2022a, 2022b) on the use of information and communication technology in educating children with special needs in the 21st century, the relationship between information and communication technology (ICT) and inclusion was discussed. The target group was students facing learning difficulties or special educational needs. One result was that the use of ICT between students with learning difficulties was more strained than among regular students, but not as widely used as expected, considering the alleged costs of ICT for these students.

(Roulstone, 2005) in a study explaining that information and communication technology and new digital technologies (devices and software) offer new hope for people with disabilities in their education and learning. Information and communication technology can be a powerful tool in supporting education and inclusion for people with disabilities.

2.6 Educational Guidelines for Teachers

To maximize the benefits of assistive technology for children with learning difficulties, both in classroom and home settings, teachers should follow certain key guidelines. These guidelines are aimed at facilitating effective use of assistive technology and making the educational process both enjoyable and productive:

1. **Comprehensive Assessment**: Start with a detailed assessment of each child's specific needs and learning challenges to determine the most appropriate assistive technology tools.

2. **Integration into Curriculum**: Seamlessly integrate assistive technology into the daily curriculum, ensuring it complements and enhances traditional teaching methods.

3. **Teacher and Student Training**: Provide adequate training for both teachers and students on how to use the assistive technology effectively.

4. **Regular Evaluation and Adaptation**: Continually evaluate the impact of assistive technology on the student's learning and make necessary adaptations to optimize its effectiveness.

5. **Collaborative Approach**: Collaborate with special education professionals, assistive technology experts, and parents to develop a holistic educational approach.

6. **Fostering Independence**: Encourage the use of assistive technology to promote independence in learning, reducing reliance on external assistance.

7. **Parental Engagement**: Involve parents in the learning process, equipping them with the knowledge and skills to support their child's use of assistive technology at home.

8. **Creating an Inclusive Environment**: Foster an inclusive classroom environment that normalizes the use of assistive technology and supports all learners.

9. **Accessibility and Resource Allocation**: Ensure that assistive technologies are readily accessible to those who need them and allocate resources appropriately.

10. **Staying Informed of Technological Advances**: Keep updated with the latest developments in assistive technology to continually enhance the learning experience.

Furthermore, students with educational needs tend to use information and communication technology more extensively than their peers. For instance, in a research study conducted by Chiang and Jacobs (2010), the educational program "Kurzweil K-3000" was used as an intervention. It functioned as a speech-to-text system, optical scanning software, writing support, note-maker, and organizer. The study highlighted how this intervention impacted reading, functional task performance, and the academic self-concept of high school students with special needs. The intervention was implemented for six weeks, primarily utilizing text-to-speech, speech-to-text, and speech-to-text functions for fourth graders, eighth graders, and high school students. The teachers recognized that these intervention sessions significantly contributed to the students' development.

2.7 Teacher Perspectives on the Effectiveness of Assistive Technology

The effective utilization of assistive technologies in education can be influenced by various factors, including teachers' perceptions regarding the use of technology in teaching and the learning process. These perceptions notably reflect the effectiveness of assistive technology among children with specific learning difficulties according to this studies (Alshamri, 2018; Ayodeji Olayemi & Ayodele Oluwaseun, 2023; Depountis et al., 2015; DePountis et al., 2015; Hollingsworth & Lim, 2015; Mosher et al., 2022) .

- **Enhancing Reading for Children** : In all research articles, teachers realized the benefits of Assistive Technology (AT) devices in improving the learning of children with reading difficulties, such as dyslexia. Researchers used the K-3000 program as an intervention to facilitate improved reading comprehension for children. This was achieved by using text-to-speech, speech-to-text, and speech recognition functions for six weeks. Special education teachers also highlighted the importance of text-to-speech and optical character recognition (OCR) tools for children facing reading difficulties.

- **Developing Written Language**
The use of suitable applications simplified the acquisition of skills related to understanding written language, such as enhancing vocabulary access and comprehension of written language. It was also recognized that these applications contributed positively to writing skills, especially concerning text structure. The use of Assistive Technology, such as Live scribe Pen, provided students with access to educational materials and the ability to develop strategies for successful homework, with special education teachers emphasizing the importance of word processing tools and text-to-speech software.

- **General Academic Performance**
Teachers indicated that children's academic performance relies on collaboration between teachers participating in special education, such as special education teachers, academic intervention service teachers, and how they provide individualized instructions tailored to students' unique needs. Assistive technology was found to enhance students' self-esteem, self-efficacy in academic performance, and their overall attitude towards school, irrespective of their actual academic achievements.

- Factors Influencing Teacher Perspectives: Teacher perspectives on the effectiveness of technology can be influenced by several factors:
  1. **Training/Experience**: Teachers' understandings of assistive technology depend on the effective training they receive before service. A lack of training and experience may lead to hesitation in integrating various activities for students with learning difficulties.
  2. **Confidence and Knowledge**: Teachers' specific skills related to assistive technology affect their confidence levels. Knowing how to set up and allocate AT as an effective tool for the learning of a particular child makes a difference.
  3. **Lack of Device and Technical Support**: The availability of appropriate software and learning programs is crucial for classrooms' assistive technology integration. Teachers expressed concerns about the limited access to suitable technology devices for supporting children with special needs.

2.8 Challenges of Using Assistive Technology for Children with Learning Difficulties

Challenges of using assistive technology for children with learning difficulties, as supported by various studies, include:
1. **Lack of Specialized IT Teachers**: The absence of specialized information technology and communication teachers for children with learning difficulties.
2. Limited Training Options: Inadequate flexibility in training options for children with learning difficulties.
3. **Limited Availability of Resources**: The limited availability of suitable hardware and software resources in developing countries.
4. **Lack of Official Engagement**: The absence of official participation by government institutions and a support structure for assistive technology for people with learning difficulties.
5. **Attitudinal Barriers:** Attitudinal barriers towards children with disabilities.

6. **Absence of Suitable Legislation and Policy Implementation**: Inadequate legislation and policy implementation for people with disabilities.
7. **Resource Allocation**: Challenges related to financial resource allocation.

3 Literature Review

(Fenstermacher et al., 2006) conducted a study titled "The Effectiveness of a Proposed Computer Program in Developing Some Classification Skills in Children with Attention Deficit Hyperactivity Disorder (ADHD)." The study aimed to determine the impact of using a proposed computer program in developing classification skills in children with ADHD. The sample consisted of 21 children aged between 7 and 11, attending different elementary schools in Alexandria. The study used pre- and post-tests along with a computer program called "Expressive Language Development." The study followed the single-group pretest-posttest design and concluded that the computer program had a statistically significant impact on developing classification skills in children with ADHD.

(Setiyani et al., 2019): In their study aimed to develop and evaluate a computer program for assessing and treating mathematical problems in learnable intellectually disabled students. They employed an experimental design with a training program as a research tool. The training program utilized computer-based mathematical operations with initial and continuous assessment, analyzing students' errors and providing immediate feedback for error correction. After implementing the program for four weeks, all students except two showed significant progress in mathematics, indicating the effectiveness of using computers to enhance mathematical skills in learnable intellectually disabled students.

(Adebisi et al., 2015) ' The research paper, "Using Computers to Teach Reading Signboards and Product Names in Grocery Stores and Supermarkets," explores a range of assistive technology devices tailored to address challenges in areas such as reading, writing, listening, memory, and mathematics for children with learning disabilities. The study underscores the importance of choosing suitable technological tools for these children, aiming to meet specific educational objectives. Additionally, it emphasizes the provision of structured guidance for teachers in classrooms. This guidance is crucial for optimizing the benefits that children with learning disabilities can derive from using these assistive technology tools.(Campbell et al., 2006) uncovered that, despite the evidence supporting the effectiveness of Assistive Technology (AT) for preschool children with disabilities, educators typically underutilized AT tools.

(Al-Zboon & Al-Dababneh, 2021) pointed out that teachers expressed dissatisfaction with their preparedness and the state of AT adoption in Jordan. The highlighted the deficiency of the technological domain in kindergartens for children with hearing impairments and the fact that some Jordanian preschool teachers were unfamiliar with the concept of AT. Al-Attiyah et al. (2020) found that the utilization of AT in early intervention programs was relatively high, particularly in domains related to integrating AT into the teaching process.

(Rajkumar & Hema, 2016) Dyscalculia, or mathematical learning disabilities, is a specific type of learning disability that impacts approximately 6% of the population. This condition is not indicative of a lack of intelligence; rather, individuals with dyscalculia face challenges in learning mathematics despite having access to adequate learning environments both at home and in school. The underlying cause of dyscalculia is believed to be related to differences in brain function. This disability has long-term implications, affecting individuals throughout their lives. In their early years, children with dyscalculia often lag in primary school mathematics, leading to potential development of anxiety or aversion towards the subject. In a related context, one study focusing on preschool education found that teachers observed positive outcomes when using Assistive Technology (AT) with hearing-impaired children. The study reported enhancements in academic performance, behavior, communication skills development, and attention span within the preschool environment. This suggests that AT can be a valuable tool in addressing various learning disabilities and enhancing educational experiences for children with specific challenges. (Nelson, Poole, and Munoz 2013). Both Al-Zboon (2019) and Lankshear and Knobel (2003) noted the insufficient preparation of teachers for the effective use of AT devices. Stoner et al. (2008) observed that early childhood teachers rarely employed AT to support emerging literacy, and its potential to assist in developing crucial skills for later learning seemed limited.

These studies collectively show the effectiveness of computer programs and technology in enhancing various skills in children with different learning and intellectual abilities, emphasizing the positive impact of technology on their development and learning outcomes.

4 Research Method

A qualitative approach was employed within the qualitative method (Qualitative Approach) to conduct this study for samples of individuals with learning difficulties at the Academic Arab College of Education in Haifa. This method allows researchers to delve deeply into the study's phenomenon and obtain detailed, precise information about the study's problem and its understanding. The qualitative analysis method typically involves collecting quantitative data (paragraphs, words) and then analyzing them interpretatively, focusing on the meanings mentioned by the participants. Subsequently, the texts provided by the participants (interview sample) were input into qualitative computerized analysis

software, such as NVivo, for the analysis of sample individuals' responses. A structured interview form was utilized for data and information collection.

Quantitative research was employed to conduct this study for samples of teaching staff and learning difficulties specialists at the university. Teaching staff and learning difficulties specialists who teach children with Specific Learning Disabilities (SLD) from each of the Emotional Intelligence programs, both general and special, answered the questionnaire elements.

4.1 *Study Samples*

The samples were divided into two categories as follows:

Students with Disabilities: The number of students with disabilities at the Faculty of Education, Haifa, for the academic year 2021/2022 is 100 students. Visual impairment is the most common disability at the college, as shown in Table (1).

Table1: The structured sample and its characteristics.

Sample	Number	Gender		Majors	Disability Type
		M	**F**		
Student	**40**	**26**	**14**	Faculty of Education, Haifa	**Poor vision, blindness, disability, lower mobility**
Faculty member	**20**	**12**	**8**		-

Table (1) shows that the majority of the study sample comes from humanities faculties such as Law, Economics, and Arts. It also demonstrates that the types of disabilities included both physical and visual impairments, and there is diversity in the academic year, with students from all academic years being represented.
Furthermore, the type of disability represented both physical and visual impairments, and there was diversity in the academic year of the students, as the sample included students from all academic years.
The target audience for this study was all teaching faculty and learning disability specialists at the university who have served children with learning difficulties in inclusive settings where programs for students with specific learning disorders (SLD) are implemented. A list of programs serving students with SLD was obtained, and a simple random sample of 20 teaching faculty members answered the questionnaire items.

4.2 *The study tools:*

The study used two tools: interviews with students with disabilities and a questionnaire for faculty members.
Interviews:
An interview questionnaire was designed after a comprehensive review of the literature on the role of assistive technology (AT) in educating individuals with disabilities. The questionnaire consisted of 13 open-ended questions distributed across four main axes, which included:
1. Describing the current situation of AT use.
2. Communication with colleagues.
3. The personal aspect.
4. The role of the college in providing AT for students with disabilities.

The interview also included an introduction about the study's objectives and explained the confidentiality of participants' responses. The questionnaire's validity was ensured through expert review, and its reliability was confirmed by sharing the interview results with a part of the study's sample for review and validation.

questionnaire:
The questionnaire used in this study was developed after an extensive review of the literature worldwide focusing on assistive technology for teachers, with a special emphasis on AT in teaching children with specific learning disorders (SLD) (Dewi, 2022; Galloway et al., 2013; Kasinath, 2009; Laub, 1999; Ng et al., 2018) . The questionnaire consisted of two parts:
1. The demographic section provided a description of the study's sample.
2. The main section included three scales:
   i. Importance Scale: Examining the teacher's beliefs regarding the importance of using AT in the development of students with disabilities, and AT's importance in teaching. This scale had 10 and 14 items, respectively.

ii.   Professionalism Scale: Assessing teacher's skills and practices related to the use of AT for teaching children with SLD. This scale included a skills sub-scale with 11 items and a practices sub-scale with 11 items.

All items in the questionnaire were rated on a 5-point Likert scale, with 5 indicating "Strongly Agree" and 1 indicating "Strongly Disagree."

4.3 Data Collection:

The researchers manually distributed the research tools to faculty members during the first semester of the 2021/2022 academic year. Follow-up interviews were conducted and took approximately 15 minutes.

4.4 Quantitative Data Analysis:

This study employed quantitative data analysis, which included the following statistical techniques: correlation analysis, t-tests, one-way ANOVA to examine questionnaire responses. The alpha level was predetermined at 0.05. The analysis techniques were applied based on the research questions as follows:

- Data collected was analyzed and expressed using means and standard deviations (STDs) for each item. The average for all items in each sub-scale was calculated.
- Pearson correlation analysis was conducted to investigate the relationship between faculty members' overall beliefs, professionalism, and the availability of assistive technology (AT).
- To address research question 5, independent sample t-tests and one-way ANOVA were used to compare differences in beliefs, professionalism, and the availability of IE faculty members based on study variables.

4.5 Qualitative Data Analysis:

All interviews were recorded, transcribed, and analyzed thematically. Data coding was done objectively by conducting interviews and encoding the information. These codes were reviewed using the constant comparative method (Straus & Corbin, 1990). Subsequently, the texts were recoded based on these reviewed codes. The codes were then grouped into common themes to form categories and subcategories. Relevant quotes were marked within these groups. The analysis of the interview data revealed three main themes:

- Faculty members' beliefs about the importance of using assistive technology and its role in the development of students with learning difficulties.
- Faculty members' professionalism.
- Faculty members' practices and the assistive technology tools they used.

4.6 Consistency of the Study Tool

The stability of the research instrument was determined by computing its Cronbach's alpha value, which is displayed in the accompanying table.

Table 2: Cronbach's alpha stability coefficients (n = 30).

Study dimension	Number of items	Cronbach's alpha consistency coefficient
The first dimension: the importance of using assistive technology	**6**	**0.846**
The second dimension: Faculty members' professionalism	**6**	**0.873**
The third dimension: Faculty members' practices and the assistive technology tools they used	**4**	**0.794**
Overall coefficient consistency	**-**	**0.945**

Through the results presented above, it is evident that the stability of all study axes is high. For example, the alpha **Cronbach's** consistency coefficient ranged (from 0.846 to 0.945), as well as the overall stability coefficient for all questionnaire items was (0.955), both of which are high stability coefficient values that demonstrate the applicability of the study tool.

4.7 Clarification to the study tool:

The researcher used the following technique to determine the degree of reaction to the tool's items, as strength was given to the options shown in the following table to be statistically handled as follows in tables 5 and 6:

Table 3: Study tool point of clarification.

Approval score	Very high	High	Medium	Low	Very low
score	5	4	3	2	1

The responses were then classified into five categories of equal range using the following equation: Class length = (highest value - lowest value) number of tool options = (5 - 1) 5 = 0.80 to obtain the classification:

Table 4: Distribution of categories according to the scale used in the study tool.

Range of averages	Description
From 1.00-1.80	Very low
From .1.8-2.60	Low
From .2.6-3.40	Medium
From .3.4-4.20	High
From 0.4.2- and more	Very high

Data analysis methods: The researcher used the following statistical techniques to conclude the traits of the research sample, compute the validity and reliability of the instruments, and respond the study's questionnaire:

1) Frequencies and percentages are used to determine the study sample's traits.
2) The mean arithmetic (mean) to decide the degree of rise or decline in the views of the study participants on each of the study variables' statements, as well as the major axes, and to arrange the statements in terms of the degree of reaction according to the highest arithmetic average.
3) Standard deviation, to find out the extent to which the "opinions of the study participants" of each of the study variables' statements and each of the major axis differ. Cronbach's alpha coefficient is used to determine the reliability of study instruments.
4) Determining the truth of the study tool's internal coherence and quantifying the relationship between the study variables by calculating Pearson correlation coefficient values.
5) The Independent Sample T-Test was used to find statistically significant differences in the responses of the study subjects based on their variables, which were divided into two groups.

One Way ANOVA was used to evaluate the importance of variations in the responses of the study population to its axis based on functional variables that were divided into more than two groups.

5 Results

The study aims to explore the reality of using assistive technology and its integration in the education of students with disabilities in the Academic Arab College of Education in Haifa from the perspectives of both individuals with disabilities and faculty members specializing in learning difficulties.

5.1 First Axis: The Perspective of Students with Disabilities

5.1.1 Usage of Assistive Technology in the Learning of Students with Disabilities at the College of Education, Haifa, from Their Perspective

After entering the data into the NVivo software and analyzing the responses of the interviewees, totaling 40, a word cloud analysis was conducted. A frequency count was performed on 200 words, which were repeated five times or more, as they were deemed the most accepted in this type of analysis. The word cloud analysis in the second part revealed...

Furthermore, the study's results indicated that assistive technology meets the educational needs of individuals with disabilities and actively contributes to their learning. The following results will be presented along with encoding (F) for female respondents and (M) for male respondents, providing a brief description of the personal information of the study participants.

5.1.2 Current State of Assistive Technology Usage in Learning:

A. **First: The Academic Field:** The results showed that all the interviewees unanimously reported significant usage of technology in various aspects of students' lives, particularly in the context of learning. There were several applications of assistive technology for learning, especially in research preparation. This was mentioned 22 times by male participants and 18 times by female participants. For instance, Participant 1 stated, "I use technology extensively for research preparation and listening to lectures." Similarly,

Participant 2 mentioned, "I use the talking computer for studying, exams, and research preparation." Additionally, Participant 12 indicated, "I use technology significantly for theoretical courses that require research preparation and completing tasks." Participant 13 also shared, "I use technology extensively for studying and preparing research and assignments, as it's a fundamental tool for me." When comparing the usage of males and females, the results indicated that females used technology more for recording and listening to lectures, with 23 mentions compared to 17 mentions by males. Participant 1 commented, "Excellent for recording lectures," while Participant 4 mentioned, "I use technology to listen to lectures online." Participant 14 shared that she uses it for "recording and writing lectures," and Participant 18 confirmed this with, "I also use it for recording lectures and studying." The study participants also noted that assistive technology aids them in preparing presentations. This was mentioned 16 times by males and 14 times by females. Participant 1 stated, "It helps me prepare presentations for the demography course," while Participant 2 mentioned, "I use it for sharing information and completing tasks like presentations and research." Participant 14 also said, "I use it for preparing presentations." Moreover, Participant 15 explained, "I frequently use technology for presentations, studying, and exams."

B. Axis of Assistive Technology in Communication: The analysis results revealed two forms of communication facilitated by assistive technology for students with disabilities. The first is communication with professors through email (20 mentions for males and 21 for females). Participant 3 pointed out, "Their cooperation is excellent, and they communicate with us through email." Participant 7 added, "Dealing with professors is good using email." On the other hand, the communication with peers is often done through WhatsApp, with 22 mentions for males and 26 mentions for females. Participant 10 mentioned, "I exchange lessons using WhatsApp." Participant 12 noted, "We all communicate through WhatsApp," and Participant 13 stated, "I often communicate with my peers using WhatsApp." However, communication with peers through email had fewer mentions, with 19 for males and 11 for females. Participant 4 stated, "Project completion through technology using email," and Participant 9 confirmed, "We also communicate using email to ease tasks and interaction with one another." Participant 15 said, "Interaction is continuous through WhatsApp and email." Furthermore, Participant 20 mentioned that, "Sometimes answering instantly via email in the same session is necessary, and this is convenient for me as I prefer it." The results above demonstrate that assistive technology actively contributes to the social integration process by facilitating communication with peers. This is consistent with the findings of Al-Uwei (2017) that mobile assistive devices and WhatsApp are effective in teaching students with disabilities and improving their academic performance, emphasizing the significance of the integration process in education.

C. Axis of Students with Disabilities' Attitude toward Inclusion: The analysis of the study's responses indicated a positive and clear attitude towards inclusion among students with disabilities. There were 14 mentions for males and 11 mentions for females. Participant 9 was convinced that "cooperating with regular people is essential as it eases my tasks, and technology facilitates this interaction through communication." Participant 10 stated, "It's excellent, and technology plays a significant role in my interaction with them through communication groups." Moreover, Participant 12 expressed her strong belief, "I am highly convinced, and I see it as an opportunity for developing skills through interaction with them." Participant 14 commented, "It's excellent and enhances our abilities and interaction for everyone." These results indicate that students with disabilities at the university have a positive attitude towards inclusion, as assistive technology, in its various forms, plays a substantial role in facilitating the inclusion process, enhancing their capabilities, and enabling them to interact with the academic community and social life. This is consistent with the findings of Abu Malham et al. (2017), which indicated that disabled individuals, especially males, possess a more positive attitude than females towards the role of assistive technology in the inclusion process, emphasizing the clear inclination toward the importance of inclusion in education.

D. Axis of Challenges in Assistive Technology Usage: Regarding the challenges faced by students with disabilities in the technology field, the analysis results showed that there are several challenges, as presented in **Table 5.**

Table 5: Challenges Faced by Students with Disabilities in the Technological Field.

NO	Challenges	M / Frequency	F / Frequency	Cronbach's alpha coefficient of significance	Cronbach's alpha coefficient of availability
1	Social Challenges	7	9	0.924	1.10

2	Academic Challenges	20	15	0.878	0.85
3	Research Challenges	2	2	0.890	0.84
4	Psychological Challenges	7	3	0.889	0.90
The scale as a whole				**0.943**	**0.93**

This table provides a comprehensive overview of the challenges experienced by students with disabilities in the realm of technology. The challenges are categorized into four primary types: Social Challenges, Academic Challenges, Research Challenges, and Psychological Challenges. The data, as well as the text analysis, is presented as follows:

The table (6) highlights that the most recurring challenges for students with disabilities are related to their academic pursuits, with both males (20 occurrences) and females (15 occurrences) expressing the significance of assistive technology in their studies. Responses indicate that without this technology, tasks and assignments would be delayed, and it significantly impacts their academic performance. Some students, especially those with visual impairments, encountered specific issues related to the quality and functionality of assistive devices such as screen readers and magnifiers, further affecting their academic progress.

These findings reveal that certain categories of students with disabilities, particularly those with visual impairments, still face significant difficulties due to the inefficiency of devices equipped with screen readers and the lack of high-quality magnifiers. These challenges align with the outcomes of previous studies in Jordan, demonstrating deficiencies in the employment of assistive technology in applied science colleges. Additionally, they corroborate findings regarding the unpreparedness of university facilities to meet the needs of disabled students.

It's important to note that assistive technology plays a crucial role in providing support for students with disabilities, as highlighted by Malcolm and Roll (2017). The positive impact of assistive technology on the academic success of individuals with disabilities is underscored. They emphasize the need for continuous improvement in technological support services to meet the evolving needs of an increasing number of disabled students in universities.

Concerning social challenges, it is evident that the absence of assistive technology has a more significant impact on females (9 occurrences) than males (7 occurrences). Responses emphasize a substantial decrease in communication, leading to feelings of isolation from the world. Some students expressed concerns that it makes them feel disconnected from society. These social challenges are critical, especially those related to communication with others, underlining the role of assistive technology in facilitating social integration.

In summary, the findings indicate that academic challenges, particularly for students with visual impairments, due to the inadequacy of assistive technology, are prevalent among students with disabilities. There is a need to address these challenges, as they affect academic performance and the overall well-being of students. Furthermore, the absence of assistive technology contributes to social challenges, particularly in communication and integration. It's essential to prioritize the improvement of assistive technology services and facilities in educational institutions to ensure equal opportunities for all students, including those with disabilities.

5.2 The second axis: the faculty members' point of view:

Research Question 1 delves into the perceptions of educators regarding the accessibility and availability of Assistive Technologies (AT) in inclusive educational settings. Out of the 20 teachers specializing in Specific Learning Disabilities (SLD), an overwhelming majority, constituting 80% of the total, reported having some form of assistive technology in their classrooms. However, it's noteworthy that 4 educators, comprising the remaining 20%, indicated that they did not possess any form of AT (as outlined in Table 6). This variation in AT presence among educators could shed light on the differing levels of AT integration and its potential impact on inclusive education practices.

Table 6 : Availability of the AT in inclusive schools.

Available		Unavailable	
F	P	F	P
16	%70	4	20%

F: Frequency   P: Percentage

This data highlights the varying degrees of AT adoption among teachers and paves the way for further exploration into the reasons behind its presence or absence in inclusive school environments. Such insights are crucial for enhancing our understanding of the role AT plays in accommodating students with learning disabilities and the implications it carries for inclusive education.

5.2.1 The Significance of Assistive Technology in Teaching (IATT)

Table 7 reveals the faculty members' perspective on the importance of integrating Assistive Technology (AT) into the education of students with Specific Learning Disabilities (SLD) and in the design of their educational programs. The data indicates that this aspect was ranked fourth in terms of importance, with a mean score of 3.85 and a standard deviation of 0.72 (on a scale of 1 to 5, where 5 signifies strong agreement).

Table 7: Significance of Assistive Technology in Teaching (IATT).

No	Dimension	Ranking of Skill	Arithmetic Mean	Standard Deviation
5	**SP**	1	3.99 .	.950
2	**PP**	2	3.92	.849
3	**IATD**	3	3.86	.901
1	**IATT**	4	3.79	1.069
4	**AAT**	5	3.67	1.271
	Total Score av		3.89	

Teachers expressed strong agreement with several key points related to the use of AT in teaching students with SLD. They strongly supported the idea of using computers as tools within SLD programs, believed that educational materials and activities significantly aided in teaching children with SLD, and recognized the value of software in enhancing the presentation and reading of texts (with mean scores of 3.99, 3.92, and 3.86, respectively). On the other hand, there were statements that garnered lower mean values, suggesting a somewhat lower level of agreement. These included the idea that children with SLD should frequently use word processors for writing (mean = 3.56), the notion that computers should be used for assessing children's progress (mean = 3.67), and the importance of providing services specifically tailored for teaching students with SLD (mean = 3.79). This data underscores the varying degrees of agreement among faculty members regarding the importance of AT in teaching students with SLD, shedding light on areas where there may be room for improvement or increased awareness of the potential benefits of AT in the educational process.

5.2.2 The Significance of Assistive Technology in Development (IATD)

When considering the importance of utilizing Assistive Technology (AT) in the development of students with Specific Learning Disabilities (SLD), faculty members' perceptions placed this aspect in the third position, with an average score of 3.89 and a standard deviation of 0.58. Notably, certain items within this category received high mean values, with scores of 3.99 and 3.95, respectively. Faculty members strongly agreed that the use of AT tools fostered increased interactions between children with SLD and their teachers. They also believed that AT tools led to heightened attention and concentration among these students, and that such tools enhanced the visual, auditory, and motor perception of SLD students. However, there were statements with lower mean values, suggesting a somewhat less enthusiastic level of agreement. These included beliefs that AT tools increased children's self-reliance, allowing them to learn in their own way, explore concepts, analyze cause-effect relationships, and learn through simulation (mean = 3.62). Faculty members also recognized that technology enabled children with SLD to actively participate in developing various educational activities (mean = 3.66), and they acknowledged that working on computers and with software made it easier to provide children with feedback (mean = 3.78).

The interview results affirmed the findings of the questionnaire. A majority of teachers working with children with SLD expressed the view that AT should be an integral part of teaching these children and in designing their educational programs. They emphasized the need for appropriate literacy software programs within these programs. One teacher

highlighted, "Technology significantly facilitates the teaching process for students with SLD, making it easier for them to comprehend the curriculum and engage with activities." Furthermore, five out of fifteen teachers underscored the importance of technology when teaching students with SLD. These insights demonstrate the potential benefits of AT in supporting the development of students with specific learning disabilities.

5.2.3 Faculty Members' Professionalism and Skills

When evaluating faculty members' professionalism, it's evident that their self-perceived practice of professionalism and their assessment of their professionalism skills achieved the highest mean scores, with an average of 3.80 and standard deviations of 0.63 and 0.62, respectively. In terms of the teachers' perceptions regarding their professionalism skills in using technology to teach students with Specific Learning Disabilities (SLD), specific items received notably higher mean values. Teachers expressed strong agreement with their ability to plan Individualized Education Programs (IEPs) using technology tools (mean = 3.92). They also felt confident in taking individual differences among SLD students into account while utilizing AT tools (mean = 3.92). Furthermore, they believed they possessed the necessary skills to effectively employ and derive benefits from technology tools in classroom management (mean = 4.87). Conversely, some items within this category received lower mean values, indicating a slightly lower level of agreement. For example, teachers strongly agreed that they could manage programs and services provided by AT tools for children with SLD (mean = 3.71). They also expressed confidence in using supporting hardware and software in the IEP programs (mean = 3.72). Additionally, they felt they had the skills required to use technology in the process of assessing and diagnosing students' learning difficulties (mean = 3.72). These findings reflect the varying degrees of self-perceived skills and capabilities among faculty members when it comes to integrating technology into the education of students with SLD. While some teachers feel highly competent in planning IEPs and classroom management, there is room for growth in other areas, such as using technology for assessment and diagnostic purposes.

Table 8: Descriptive Statistics of Faculty Members' Professionalism and Skills.

	N	Range	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Std. Error	Statistic
A1: they have knowledge of the Assistive Technology	108	4	3.91	.110	1.140
A2: How much do you use Assistive Technology in light of of students with specific learning disabilities.	108	4	3.98	.113	1.176
A3: How focused is the student on the activities in Assistive Technology	108	4	3.10	.116	1.207
A4: Has Assistive Technology played an important role in improving College of Education faculty skill	108	4	3.73	.092	.953
A5: The difficult to use technology (computer, tablet, video calls, educational applications, etc.)	108	4	3.74	.100	1.036
A6: Student satisfaction when transitioning to Assistive Technology	108	4	3.33	.089	0.927
A6: Do you feel that all students are participating in your course with Assistive Technology	108	4	2.95	.095	.990
A7: Administrators feel satisfied with the performance of the faculty in Assistive Technology through student evaluation	108	4	3.27	.079	.816

A8: Do you feel uncomfortable with the results of the students and the possibility of mass cheating	108	4	3.88	.096	.993
A9: Did you have difficulty preparing lessons and electronic presentations	108	4	3.02	.104	1.076
A10: Are you satisfied with the students' performance?	108	4	3.14	.098	1.018
A11: Is there a difference in the performance of students now after use Assistive Technology	107	4	4.17	.089	.916
A12: Do you want to continue use the Assistive Technology in the future	108	4	2.96	.133	1.380
Valid N (listwise) 107					

Table 8 presents the descriptive statistics for faculty members' professionalism and skills regarding the use of Assistive Technology (AT) in their teaching practices. This table offers valuable insights into the perceptions and self-reported capabilities of these educators. The following results and discussion provide an overview of the findings:

- A1: Faculty members reported having knowledge of AT with a mean of 3.91. This suggests that, on average, they possess a reasonably good understanding of AT.
- A2: The mean score of 3.98 indicates that faculty members use AT to a moderate-to-high extent when working with students with specific learning disabilities. This demonstrates their willingness to integrate AT into their teaching methods.
- A3: Faculty members reported that students were moderately focused on activities involving AT, with a mean score of 3.10. This suggests that the effectiveness of AT in engaging students may have some room for improvement.
- A4: AT played an important role in improving the faculty's skills, with a mean score of 3.73. This indicates that faculty members recognize the professional development benefits of using AT.
- A5: The mean score of 3.74 reflects that faculty members find using technology (e.g., computers, tablets, video calls, educational applications) somewhat challenging. This highlights potential areas where training or support may be needed.
- A6: On average, students were reasonably satisfied with the transition to AT (mean = 3.33). However, there is room for enhancement in this aspect.
- A6: Faculty members expressed a moderate level of confidence (mean = 2.95) in the participation of all students in their courses when using AT. This may indicate concerns about equitable access and engagement.
- A7: Administrators' satisfaction with faculty performance in using AT, as indicated by student evaluations, received an average score of 3.27. This suggests that administrators generally perceive faculty performance positively.
- A8: The mean score of 3.88 suggests that faculty members feel somewhat uncomfortable with the possibility of mass cheating when using AT. This could be indicative of concerns related to academic integrity.
- A9: Faculty members reported moderate difficulty (mean = 3.02) in preparing lessons and electronic presentations using AT. Additional support or training may be beneficial in this regard.
- A10: Faculty members expressed moderate satisfaction (mean = 3.14) with students' performance when AT is employed in teaching.
- A11: There is a notable difference in students' performance now compared to before the use of AT, as evidenced by the high mean score of 4.17. This suggests that faculty members believe AT has had a positive impact on student outcomes.
- A12: Faculty members are somewhat uncertain (mean = 2.96) about their intention to continue using AT in the future. This may indicate the need for ongoing support and professional development to maintain their commitment to AT integration.

In summary, the results from Table 8 indicate that faculty members generally have some knowledge of AT and recognize its importance in improving their skills and enhancing students' performance. However, challenges related to the use of technology, student satisfaction, and future intentions to use AT need to be addressed. This underscores

the importance of providing training, resources, and ongoing support to faculty members to maximize the benefits of AT in inclusive education.

6 Discussion

The primary objective of this study was to gain insight into the beliefs, professionalism, and practices of faculty members who work with students with Special Learning Difficulties and Disabilities (SLDD), as well as to assess the availability and role of Assistive Technology (AT) in inclusive schools and colleges. The study examined these aspects from the perspective of resource rooms within educational institutions.

The results of the study revealed that faculty members who specialize in teaching students with SLDD hold generally favorable perspectives on the use of AT in their educational practices. Notably, the section of the survey concerning faculty members' perceptions of their professionalism in using technology for teaching yielded the highest mean score. On the other hand, the availability of technology received the lowest mean score. These findings align with existing literature (Atanga et al., 2020; Courtad & Bouck, 2013; Forgrave, 2002; Raskind & Higgins, 1998; Wada Bashir et al., 2021; Young, 2013) , which suggests that teachers are enthusiastic about leveraging technology to support reading and writing instruction.

These results indicate that faculty members who instruct students with SLD possess both the skills and motivation to incorporate AT into their teaching processes, despite the relatively basic and limited technological resources available within inclusive schools. It is noteworthy that the participating teachers recognized the significance of technology in crafting educational programs for children with learning difficulties, as well as its pivotal role in their development. This outlook is corroborated by research conducted by (D. P. Bryant & Bryant, 1998) who observed that teachers working with students having SLD considered technology beneficial. However, the adoption and knowledge of AT were constrained due to a lack of training and limited access to resources.

The study questionnaire was meticulously designed to facilitate teachers' responses, and the feedback from teachers was overwhelmingly positive. Some teachers indicated their ability to comprehend the needs of children with SLD and their capacity to facilitate their learning through AT. Others reported having knowledge of specific technological tools that could enhance the learning experiences of these students. Teachers mentioned supplementing their teaching methods by utilizing audio, video, and visual media.

This positive sentiment echoes the findings of two other research articles (Forgrave, 2002; Kisanga & Kisanga, 2022; Lersilp, 2016; Manase, 2023; Messmer, 2013; Muhibbin, 2020; Wada Bashir et al., 2021; Young, 2013)which also reported that faculty members held a favorable attitude and demonstrated competence in using assistive technologies within schools, particularly in settings catering to children with disabilities, including those with SLD. The congruence in these results may be attributed to the focus of these studies on special needs teachers, who tend to exhibit a stronger inclination toward embracing assistive technology to enhance learning outcomes within special education contexts.

In summary, the study suggests that faculty members working with students having SLDD possess a positive attitude and competency in utilizing AT. While there is a recognition of the importance of technology in enhancing the learning experiences of these students, there remain challenges related to training and resource availability. These findings underscore the need for ongoing professional development and resource support to maximize the potential of AT in inclusive education for students with Special Learning Difficulties and Disabilities.

7 Conclusion

This study delved into the utilization of assistive technology (AT) in the education of students with learning difficulties and disabilities at the Academic Arab College of Education in Haifa, focusing on both faculty and student perspectives. The findings provide valuable insights into the current state of AT integration in higher education settings and its impact on students with disabilities.

From the perspective of students with disabilities, the study revealed a prevalent and positive utilization of AT in various aspects of their academic lives. Students reported using technology extensively for research preparation, accessing lectures, and preparing presentations. Communication tools, such as email and WhatsApp, played a significant role in connecting with professors and peers, fostering a sense of inclusion and collaboration. Moreover, students exhibited a clear and favorable attitude towards inclusion, underlining the pivotal role of AT in facilitating their integration into the academic and social community.

In contrast, faculty members' perspectives on AT revealed notable variations in terms of availability and importance. While a majority of Specific Learning Disabilities (SLD) teachers possessed some form of AT in their classrooms (80%), a substantial minority (20%) did not have AT tools available. This suggests differences in AT adoption among educators, which may have implications for inclusive education practices.

The study also assessed the importance of AT in teaching students with SLD. Faculty members displayed a high level of agreement regarding the benefits of using AT as a teaching tool, particularly in enhancing the presentation and reading of

texts. However, there were areas where faculty members' agreement was less pronounced, such as the frequency of using word processors for writing and the need for specialized services tailored to teaching students with SLD. These varying levels of agreement indicate opportunities for improving awareness and training on the benefits of AT in education.

Challenges in the utilization of AT were identified, including resource shortages, the need for ongoing teacher training, and the requirement for adaptable technology to accommodate diverse needs. Additionally, the study highlighted the technical challenges that students and faculty may encounter, emphasizing the importance of regular maintenance and updates.

In conclusion, this study provides valuable insights into the current state of AT utilization in higher education for students with learning difficulties and disabilities. It underscores the positive impact of AT on students' learning experiences and their attitudes toward inclusion. The findings also shed light on the variability in AT adoption among faculty members and the need for enhanced training and support. This study not only contributes to expanding scientific knowledge but also offers practical recommendations to improve the effective use of AT, ultimately enhancing the quality of education and opportunities for students with disabilities.

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Authors' contributions

The final manuscript has been writing, reviewed and approved by **Nadia Ghalia**[1]

Availability of data and materials

The data that support this study are available in the manuscript.

Consent for publication

Not applicable.

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