Usage of Technology in Education of Hearing Impaired

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Abstract - **It is essential to provide proper and high-quality schooling to hearing-impaired people in order for them to live a self-sufficient existence. Conventional educational methods are insufficient for hearing-impaired people's education. Education for hearing disabled people has become increasingly beneficial as a result of the use of new technologies. When looking at the scholarly literature, it is clear that there are few reports on the systematic usage of technology in the schooling of hearing-impaired people. The aim of this research is to survey the technology utilized in the education and training of hearing-impaired people in this context. The survey approach was used as a qualitative analysis method in this report. The study's results were viewed as innovations that aid in the advancement of hearing-impaired people's academic skills.**

Index Terms – **Hearing Impaired individuals, Technology, Education.**

1.INTRODUCTION

Individuals who are deaf or hard of hearing need special education. There are some guidelines for classifying hearing impairments; they are based on the degree of hearing loss, which is assessed by audiological measurements, and they are diagnosed as minor, severe, or serious hearing loss after hearing test rehabilitation programs begin. Hearing disabled people are unable to detect words, and as a result, they are unable to learn voice and vocabulary, preventing vocal contact. Hearing disabled students' special education programs are investigated, and it is discovered that their needs are diverse. Hearing impaired students can experience a variety of challenges in school and in their social lives. A child's learning development may be hampered by a hearing disability, particularly when it comes to interpreting and producing spoken language. Although there have been several opinions on which

methodology being the most successful through the years, specialists believe that the instructional process should be tailored to the particular student's skills, desires, and personality. In the schooling of hearing-impaired people, technology plays a critical part. Teachers must respond to each student in their class and dealing with hearing disabled students necessitates certain changes to standard teaching methods. New methods, on the other hand, are helping students and teachers to transition to formal schooling more smoothly. With the exponential advancement of information technology, the holes in fields where the traditional approach for educating people with special needs is inadequate are being filled. Items that were impractical to solve with the traditional approach are still challenging to accomplish with these technologies. Students with disabilities would be forced to learn in a more relaxed environment as a result of this. Shortening the length of training, maintaining interest, encapsulating abstract ideas, providing practical interactions, and generating further learning needs are all benefits of training technology. Computers are being used to help students with autism in special education improve their learning skills by helping certain aspects of growth such as hand-eye coordination, imitation, and language production. Educators also use computer educational tools to teach adolescents with disabilities general problem-solving techniques such as algebra and reading. Computer training systems have been shown in several research to improve academic knowledge, vocabulary, arithmetic, reading, and intelligence in children with disabilities, as well as their attention span and learning efficiency. Students with hearing impairments may interpret documents produced on computers using computer programs and modified equipment. Computer-assisted training is a teaching approach that consists of a learning system in which

students study in a computer environment, which increases the teaching process and student engagement, and which learners may use at their own pace. Individualization in schooling is made possible through computer-assisted teaching. A machine is used as a medium in computer aided training to teach a lesson. Students who study how to use computers with instructional software do so at their own speed and skill.

Individualization and self-improvement, immediate guidance, reliable corrective mechanism, repetition without coercion, immediate reinforcement, step-by-step instruction, repeated reaction by children, inspiration, psychological satisfaction, and constructive learning in education are all advantages of utilizing software for computer-aided training in special education, according to Ari and Bayhan [4]. The introduction of technology in special education would make it possible for teachers and people who need special education to grasp and utilize emerging technologies, as well as to stay up with advances to ensure that courses are aligned with technical advancements. Tablet computers are one of the most prominent technological advancements in recent years. Mobile computing devices, such as mobile phones, laptops, and tablets, as well as the usage of Personal Digital Assistants, are all accessible (PDA). Tablets have the ability to link to wireless networks as well as most devices [24]. Tablets were found to be favoured as instructional instruments in education as a result of research undertaken with them. Tablets are preferred because they offer a rich educational and training experience for students and instructors, which makes students enhance their curiosity and desire in the class, as well as aids their learning. To address the challenges in utilizing technology, these students and teachers can obtain ongoing guidance and instruction based on their competencies in using Tablet PC [33]. Tablet computers can be used when demonstrating aim skills, teaching self-care skills, acquiring freedom skills, and applying for prizes in visual applications, according to teachers' opinions [20]. Teachers stressed the value of visual communication opportunities for students with hearing disability in another study, as well as the usage of electronic instructional tools such as computers, the internet, tv, videocassettes, and computer floppy disks. Similarly, Tassel-Baska et al.

[35] recommend incorporating technologies into training systems.

The usage of technology in training applications has been shown to improve performance by Gersten and Baker [14].

Individualized Education Programs for special needs adults can be evaluated by creating a practical timeline, which is well established. An assessment of assistive devices that are either utilized or may be used by special needs adults should be included in the IEP [31]. "At least one member of the IEP team should be familiar with assistive technologies.'' It is critical that at least one member of the IEP team present services to the meeting in the form of books, catalogs, or websites in order to determine which auxiliary technology are accessible or needed. To be prepared to deliver assistive technology equipment or facilities, the IEP staff must have a thorough understanding of how this technology can be accessed, used, and tested. In the most basic level, to be able to provide an assessment of assistive technologies in IEP meetings, the evaluation should be listed as follows: identification of the student's needs, student learning of how to use assistive technologies, education of family members and staff, and determination on how and when to provide technical assistance on the use of assistive technologies. Since infants born with hearing disorder do not develop linguistic and speech abilities for a variety of factors, including not hearing enough voices, not perceiving vocal input, and not being able to use their mother tongue every day, these students are at least five years late in their learning. The rapid increase of educational innovations, focusing on teachers, is vital for the advancement of schools. Providing technological assistance to schools of hearing-impaired people so that the challenges faced in hearing challenged schooling can be changed, and the rapid rise in educational technologies, reflecting on teachers is important for the growth of schools. Looking around the globe, it is clear that technologically assisted research to improve the standard of education in hearing disabled schools lead to school improvement [34, 41, 42]. It is very effective to promote awareness and ability teaching through visual means as far as possible, to organise instructional environments, and to enable peer participation in the education of hearing-impaired

children. Furthermore, after contemplating the value of learning by doing and the learners' long-term retention, the significance of constructive learning dependent on experience in the curriculum of the deafeningly deafeninglydeafeninglydeafeninglydeafeninglydeafeninglydeafeningly This aids students' learning by their curiosity and desire in the lesson [2-9-18-19]. To address the challenges in utilizing technology, these students and teachers can obtain ongoing guidance and instruction based on their competencies in using Tablet PC [33]. Teachers' perspectives on the use of tablet computers suggest that they can be used when teaching target skills, self-care skills, independence skills, and applying for awards in visual applications [20]. In another study, teachers emphasized the importance of visual education tools for students with hearing impairment in proposals related to educational tools. Similarly, Tassel-Baska et al. [35] recommend incorporating technologies into training systems. The usage of technology in training applications has been shown to improve performance by Gersten and Baker [14]. Individualized Education Programs for special needs adults can be evaluated by creating a practical timeline, which is well established. An assessment of assistive devices that are either utilized or may be used by special needs adults should be included in the IEP [31]. At least one member of the IEP team should be familiar with assistive technologies. It is critical that at least one member of the IEP team present services to the meeting in the form of books, catalogs, or websites in order to determine which auxiliary technology are accessible or needed. To be prepared to deliver assistive technology equipment or facilities, the IEP staff must have a thorough understanding of how this technology can be accessed, used, and tested. In the most basic level, to be able to provide an assessment of assistive technologies in IEP meetings, the evaluation should be listed as follows: identification of the student's needs, student learning of how to use assistive technologies, education of family members and staff, and determination on how and when to provide technical assistance on the use of assistive technologies. Since infants born with hearing disorder do not develop linguistic and speech abilities for a variety of factors, including not hearing enough voices, not perceiving vocal input, and not being able

to use their mother tongue every day, these students are at least five years late in their learning. The rapid increase of educational innovations, focusing on teachers, is vital for the advancement of schools. Providing technological assistance to schools of hearing-impaired people so that the challenges faced in hearing challenged schooling can be changed, and the rapid rise in educational technologies, reflecting on teachers is important for the growth of schools. Looking around the globe, it is clear that technologically assisted research to improve the standard of education in hearing disabled schools lead to school improvement [34, 41, 42]. It is very effective in the education of hearing-impaired children to support knowledge and skill teaching with visual means as much as possible, to organize educational settings, and to enable peer interaction. Furthermore, when considering the importance of learning by living and the learners' permanence, the importance of active learning based on practice in the education of hearing-impaired children is very important. The level of schooling for children with hearing disability is highly influenced by the community in which they are educated. Isolation in the classroom, appropriate facilities and devices, and children's inclusion in individual-group hearing aids and educational programs are all important. Hearing impaired children may feel embarrassed and hesitant when they fail in the classroom. Atthis point, computer-aided materials that hearing-impaired individuals can use on their own initiative provide the opportunity to repeat and provide an individual learning environment, thus providing the individual's self-confidence and influencing learning positively [13]. It is emphasized that effective materials to be prepared for hearing impaired individuals should be paintings and animations that are front-panel, visual rich, and games-based [21]. As a result, the aim of this research was to group the technology utilized in hearing-impaired people's training under one heading and present them as technologies for promoting vocabulary, voice, and academic skills. In this background, researchers in Turkey looked at the usage of technology in the education of hearing-impaired children. This research is expected to shed light on the widespread usage of technology in hearing-impaired teaching, as well as the growth in

experience and expertise in utilizing these technologies.

2 METHOD

The survey form was used in this analysis. In historical and qualitative analysis, the survey approach is used. Then, the relevant records are read, and the knowledge obtained is coded. Later, the coded papers were gathered, and the findings that were provided within the framework of the analysis were deleted.

2.1 Data Analysis

As a result of the analysis of the data, the findings were collected and examined under two categories as the categories used to support the language, speech and academic skills of the hearing impaired.

3 RESULTS AND DISCUSSION

3.1 Techniques used to support academic skills in hearing impaired

Schools with the responsibility of managing hearing-impaired people can pursue reform, creativity, and growth research in the era of knowledge and technology, due to the demands of the times and the needs of community. Significant functions, such as arranging and organizing different instructional events, come under the supervision of the schools in this respect. The exercises that will be introduced to the students are those that will challenge their brains, make them consider, build a cause-and-effect relationship, and it is predicted that they will have the characteristics of reconciling concepts and reality in various ways, as well as understanding the significance of societal principles [30]. Around the same period, schools should reap the benefits of the twenty-first century's technological advancements. It is safe to assume that students who have difficulties are successful in addressing these problems because of the technologies utilized in the teaching of autistic students, the hurdles, and hence the learning [29]. Demirhan [10] set out to investigate the impact of technology on the schooling of students with hearing loss. According to the findings, students in the application community learned lessons earlier, allowing them more opportunities to perform and repeat [10]. It was discovered that students who gained from the class's technology had higher course

performance than students who received traditional instruction, and also had better outcomes than students who had certain difficulties but were not ineffective. Technology has been shown to have eliminated the diversion issue and students with hearing difficulty have strengthened their participation in the lessons as they have become more enjoyable to understand. The computer-aided teaching material created has effects on the written speech abilities of students with hearing disability, such as the ability to form sentences and use timing correctly, according to Ciftci [8]. The study's aim was to uncover the views of Language and Literature teachers regarding resources developed by students with hearing impairment. The study's findings revealed that computer-assisted instructional materials had a significant impact on students' written language abilities, such as composing sentences and correctly utilizing past, current, and potential periods. We tried to use information technology and distance education in the Cal [6] research to reduce the difficulties in interpretation and comprehension that individuals with hearing disability face in our society. In conclusion, it is claimed that the devices utilized would benefit students with hearing impairments in any way. In 2008, researchers conducted a report named Utilization of Computer-Assisted Animations in the Process of Education of Hearing-Impaired Individuals [21]. In this research, we looked at the usage of computer-assisted animations in the education of hearing-impaired people. The views of the teachers at the hearing disability school were taken into consideration, and a solution plan was presented on which elements could be included if animations were to be included. Teachers also stated that if hearing-impaired students have strong computer and technology abilities, computer-aided instruction should be required in all classrooms, and a program for hearing-impaired students should be developed, hearing-impaired students will be more competitive in class as a consequence of this study. Furthermore, it was stressed that appropriate applications for students with hearing impairments, artistic richness, paintings and graphics, front-line voice, and games-based software be equipped. This research will help teachers in the area of special education pay heed to what they can do while creating apps [22]. Furthermore, Kot, Sonmez,

Yikmis, and Ince [26] discovered that the Touch-Math methodology is useful in teaching addition skills to people who are deaf. A web page for the education of the hearing disabled was created in another report, and it was concluded that hearing-impaired individuals were repeatedly educated at distance education with the aim of achieving permanence [6], and Akdemir [12] completed a Computer Assisted Instruction in Private Instruction a Three Case Studies. The aim of this research is to look at how three people with developmental disabilities, hearing impairments, and orthopedic impairments utilize computers at a special education and recovery center. As a consequence, it has been decided that in special education and therapy settings, instructors tend to utilize instructional gaming devices in conjunction with instruction and rehearsal software. Individuals of hearing disability master words better using machine aided learning than they do with traditional approaches. The use of graphics in computer-assisted instruction to illustrate unfamiliar terms (object, context, etc.) found during reading-writing instruction for people with hearing loss reduces the amount of time spent on the topic. In addition, Karal, Silbir, Bahcekapili, and Atasoy [23] argue that graphical icons should be used as instructional content in hearing-impaired students' classrooms, and Alternative Communication Systems should be used. Individuals who are deaf or hard of hearing will learn and enjoy visuals. Yaman, Donmez, Avci, and Yurdakul [43] studied the impact of utilizing mobile applications in the literacy training of hearing-impaired students and discovered that integrating mobile applications into the learning environment improved the hearing-impaired students' participation and encouragement. In today's environment, technology provides a plethora of possibilities and conveniences for any human being. Flexibility, cost-cutting, performance, and individuality are also important factors in the contribution of knowledge and communication systems to educational and training processes. In particular, it appears that the main features that hearing impaired people need in the educational process are the planning of individual differences in education and the potential to provide a vital opportunity for hearing impaired people when information and communication technologies are

used correctly, which will be the visuality presented by the right technique. This research was conducted to determine how information and communication technologies are used in Hearing Impaired Primary and Secondary Schools.

In the study, 40 students and 14 teachers from SweekarUpkar Special School for Deaf's primary and secondary schools took part. In terms of the scope and intent of the analysis, it was planned as a review of qualitative testing techniques. Data was compiled using data collection techniques, and data diversification was conducted to improve the validity and reliability of the data. The data was analyzed using descriptive survey methods. According to study, information and communication technology are the key instructional methods preferred by teachers in the primary and high school teaching process for hearing impaired persons. Teachers have claimed that Information and Communication Technologies (ICT) aided in the delivery of lessons and boosted student engagement. The key issue is that the technological equipment is outdated, and the students regard it as a video game instrument. Students have reported that they did not research using a screen. Teacher interviews were used to develop a program for hearing disabled students as well as provide technical material for the curriculum. The findings would aid in the educated use of information and communication technology in the curriculum of hearing-impaired students. Yildirim and Saban [44] looked at the influence of computer-assisted geometry teaching on students' Van Hiele geometry thought and geometry achievement based on their hearing condition and found that computer-assisted geometry teaching has a significant impact on students' academic achievement. Furthermore, applicants Teke and Gezgin [39] performed a report on the evaluation of educational software and writing tailored for the usage of hearing-impaired students in their Turkish language education and discovered that applications in which educational software contributes to the teaching of Turkish, well-designed resources such as visual and film, are beneficial.

3.2 Techniques used to support language and speech skills in hearing impaired individuals

Learning Environment Design for Improving the Ability of Hearing-Impaired Individuals to Use

Additional Abilities in Turkish was conducted in a research conducted in 2009 [22]. In this research, a learning atmosphere facilitated by knowledge and communication technology was created to help hearing-impaired people develop their communication skills. The aim of this study is to see how a computer-assisted content will help learners learn to use literacy adds in addition to literacy skills and to teach the principles of accumulated time. The beneficial impact of visual objects provided by hearing disabled people on their reading abilities have been reported as a consequence of the study. It has been determined that technology-assisted applications will target multiple senses, thus the the focus and performance rate of hearing-impaired persons. In order to transcend sensory deficits, the conditions in which hearing-impaired individuals are taught can be filled with adequate visuals for a more extraordinary degree of growth. Subtitles are used as an alternative to sign language for speech recognition technology, particularly in live broadcasts, for hearing disabled persons. In a video broadcasted live on a web page with the aid of a media server, Koruyan [25] demonstrates how to translate texts and instant texts utilizing a web-based Web Speech API, which is sponsored by Google. The web application is written using JavaScript and PHP programming languages, as well as the jQuery library, and the video feed on the web page is supported with the video feature that the HTML5 language brings. Hearing-impaired individuals interact with one another through sign language. Individuals who do not recognize sign language find it difficult to interact with the deaf. The aim of this study was to use emerging software technologies to solve this issue. Text-to-speech systems and a host of other applications have been combined to provide an automated framework. A mobile application running on the Android operating system converts users' conversations into texts and sends them instantly to a remote server as part of a system called Writing Tracking of Voice Lessons. Web pages and Android phones with asynchronous data exchange (AJAX) software can track the conversation texts stored in the database on the remote server in real time. An open Web-based course management framework was created as part of the thesis, and all of the courses mentioned can be accessed later [5]. Turgut,

Bozanand Turgut [38] Turgut, Bozanand Turgut [38] Turgut, Bozanand Tur The aim of this study was to look at the contact patterns of hearing-impaired people and their regular hearing colleagues on social media. When the social media use, frequency, length, social media channel, use intent, and platform variables used by normal hearing and hearing-impaired individuals involved in the research are combined, it is possible to conclude that social media is an effective connectivity mechanism for students and that it is widely utilized for communicative purposes. In addition, Uysal, Yilmaz, Eken, and Sayar [40] determined the degree of disruption in pronouns (r, s-!, z) isolated on a mobile basis, as well as several listening activities. It has been suggested. The sound will be taken again at the conclusion of the related levels, and the standard will be measured according to the real need, and if it can be restored, it will be elevated to the upper level (from the beginning to the middle level). As a result, it aims to aid the growth of people who have difficulty pronouncing words.

4 CONCLUSIONS AND RECOMMENDATIONS

The technologies used in hearing impaired education and preparation was investigated in depth in this research, and the results of studies in the language and academic skills areas were explored. The study findings were divided into two categories: academic abilities and language and speaking skills. The results of the study indicate that hearing-impaired people's training technologies have been used to improve the most language skills as well as academic knowledge. There have also been studies on mathematical abilities. The findings revealed that the usage of technology in the schooling of hearing disabled students is still prevalent, as well as the desire to improve student motivation. When technology is used to develop language and speech abilities, it is commonly seen as an alternative to traditional methods of communication improvement. Web-based or smartphone apps created as a substitute for sign language are popular, according to the findings. 'Furthermore, the usage of hearing-impaired people to support listening abilities has resulted in the process of translating a dialogue into a statement." As a consequence, the following proposals for more

study and implementation in the direction of the research results are presented:

- For hearing-impaired people, it may be advisable to develop more mobile applications in accordance with the Android and IOS operating system.
- Other academic skills besides reading and writing may also be developed.
- It can be suggested that the developed technologies should be done considering the diagnosis level of hearing-impaired individuals.
- Teachers' knowledge and skills about using technology-supported applications forteaching of hearing-impaired students can be increased by organizing in-service training and seminars.

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