The Impact of Technology in Visually Impaired Education

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ABSTRACT

According to WHO action plan 2006-11, 10% of people worldwide are estimated to have a disability. Disability relates to a distinct connotation. According to the global burden of disease (GBD), disability is a loss of health, where health is defined as the ability to operate in a group of health domains, including hearing, vision, movement, and cognition. Due to population increase, the advent of chronic illnesses, and advancements in medicine that preserve and lengthen life, the number of people with disabilities is steadily rising, resulting in an overwhelming need for health and rehabilitation services (Srivastava and Khan 2008). Depending on the kind and degree of the condition, the prevalence of disability in South-east Asia varies from 1.5% to 21.3% of the total population (Mont 2007). The assessment, treatment, and prevention of disability have received little attention, even though its incidence has increased globally for a variety of causes (WHO 2002). To comprehend this idea, this study focuses on an alternative model of disability. It considers poverty to be the cause of incapacity. It also covers many disability policies in India, including those pertaining to employment, education, and rehabilitation for people with disabilities. Maintaining the educational emphasis, the second section of the article looks at visual impairment and how assistive technology has been used to educate visually impaired kids at the school level. Additionally, it examines students' positive perspectives on their social inclusion via the use of assistive technology and social media access.

KEYWORDS: Technology, Education, Visualy Impaired

INTRODUCTION

A vast network of structures makes up society. people from a certain segment of society and their own lives.The civilization they jointly build determines who they are. The society has never been an equitable entity, despite this group effort. Because its hegemonic nature, resources are allocated unevenly in society, and those with varying capacities often face the brunt of this. Hierarchies, beliefs, and myths that result in different types of discrimination are often the cause of this exclusion. Due to this institution's discriminatory constitution, members of this oppressed minority who are visually impaired often miss out on even their most fundamental rights.

This depressing situation is being improved by education, particularly for those who are blind or visually impaired. The invention of Braille, which bears the name of its inventor Louis Braille, revolutionized education and made it accessible to those who are blind or visually impaired. Since

then, technology has been used to help visually impaired persons become more independent. Despite the many barriers they face, an increasing number of visually impaired individuals are using technology to help them join the field of education and academia in the current day.

Society has not given those with vision impairments equal treatment. They have never been given the chance to demonstrate their abilities, and society has purposefully kept them apart from the majority (Raut, 2009). Special institutions and duties have been established for them to achieve this exclusion. They have been restricted to certain professions such as furniture and candle manufacturing. They have been unable to use their advantages because of society's hegemonic character.

Many terminologies, including legally blind, blind, partly blind, stone blind, visually limited, poor vision, partially sighted, visually handicapped, and visually impaired, are used in relation to vision disorders.

In the context of education, "visually impaired" is a general word that encompasses all of the aforementioned. It is preferable to use the word "blind" when referring to those who have either no vision at all or only see light. The phrase "low vision" should be used for those whose visual acuity, with the greatest feasible correction, falls between 6/18 and 6/600 in the better eye. Technology is a term that helps us in every aspect of our lives. It facilitates and boosts our effectiveness and efficiency. It created a single, discrimination-free forum for all people, including those with disabilities. Currently, technology greatly benefits those who are visually impaired.

All platforms provide a variety of applications to help people with work, education, internet browsing, ticket booking, banking transactions, and many other tasks; all they need is screen reader software installed on their device. Similar to this, there are several tools available to help people become independent, such a talking ATM for transactions, a white Kane for walking, a talking thermometer for taking temperature readings, and a Braille printer/embosser for writing text in Braille.

LEGAL PROVISIONS ABOUT EDUCATION FOR PERSONS WITH DISABILITY

According to Berthold Lowenfeld, education should provide blind children with awareness of their surroundings, confidence to manage, and a sense of acceptance as individuals.

The Indian constitution's preamble provides equal treatment for all citizens, including those with disabilities and oppressed groups. It aims to promote social, economic, and political justice, as well as equitable chances in all areas. The directing principle of state policy is that the state should prioritize the welfare of its citizens by providing security and protection. The state must provide the right to work, education, and public aid for those in need, within its economic capabilities and development. This includes instances of unemployment, old age, disease, and disability.

According to clause 41 of the Directive Principle, the state is responsible for providing free and obligatory education to all children until the age of 14. (Section 45, the Directive Principle of State Policy).

People with disabilities In 1995, free education was mandated for those with disabilities up to the age of 18. Despite these facilities, barely 5% of visually impaired individuals are enrolled. Educating visually handicapped individuals is considered a charity activity in a society where education is a basic right. The statute promotes integrated, residential, nonformal education, and functional literacy. The goal is to promote education via open schools and universities, with a target of 3% (currently 4%), as well as do research on assistive equipment and human resources. Various committees prioritize education for the handicapped.

The Universal Declaration for Human Rights (1948) states that everyone, including children with disabilities, has the right to an education.

The education of children with disabilities should be integrated into the general school system. Indian Education Commission (1964–1966) Efforts should be made to create integrated programs that allow disabled students to attend conventional schools. National Policy on Education (1967). According to the United Nations General Assembly Declaration on the Rights of Persons with Disabilities (1975), children with disabilities have same rights as everyone else. The National Policy on Education (1979) emphasizes the need of expanding educational opportunities for children with impairments. According to the Working Group Report on Education of Children with impairments (May 1980), children with all types of impairments need special assistive devices and equipment for inclusion in conventional classrooms. Everyone, regardless of individual characteristics, has the right to education. World Conference on Education for All (1990). Education for individuals with impairments is a crucial component of the educational system (UN Standard Rules with Equalization of Opportunities for Persons with impairments, 1993). According to the Rights of Children with impairments (NIPCCD, 1999), pre-primary and primary schools should have more qualified staff and facilities to accommodate students with impairments.

Inclusive education is crucial for fully integrating people with disabilities into society. This initiative aims to provide education for people with disabilities in regular schools. Article 7 of the Salamanca Framework for Action indicates that an inclusive school educates students together. The school will meet students' different needs via suitable facilities, curriculum, organizational structures, instructional styles, resource usage, and collaboration with committees. Continuous assistance is essential for children with special needs. Johnson describes it as a flexible and tailored support system for children and young people with exceptional educational requirements due to disabilities or other causes. It is a crucial part of the education system, offered in conventional schools that prioritize inclusive education. According to the UN Special Rapporteur on Disability. Clarify the notion of inclusive education (UNESCO, 1998) by Benguet Lindqvist.

Our school systems do not have the right to accommodate certain sorts of pupils. A country's education system should be changed to accommodate all children's requirements. The 2016 Rights of Persons with Disabilities Act prioritizes education for PWDs. Educational institutions should:

(i) Ensure equitable admission, education, and sports and leisure opportunities for all individuals.

(ii) Make buildings, campuses, and amenities accessible.

(iii) Provide appropriate accommodation based on the individual's needs.

(iv) Offer personalized help in contexts that promote academic and social growth, aligning with the objective of full inclusion.

(v) Provide education to those who are blind, deaf, or both in suitable languages and ways of communication.

(vi) Identify and address unique learning problems in children early on using appropriate pedagogical and other means.

(vii) Monitor the participation, progress, and completion of education for all students with disabilities.

(viii) Provide transportation for disabled children and their attendants with significant support requirements.

The appropriate Government and the local authorities shall take the following measures for the purpose of section 16, namely:

(a) Every five years, conduct a survey of school-aged children to identify those with impairments, assess their special requirements, and determine how well they are fulfilled. The first survey must be undertaken within two years of the Act's start.

(b) Establish enough teacher training institutes; (c) Train and hire teachers with disabilities who are qualified in sign language and Braille, as well as those trained to educate children with intellectual disabilities.

(d) Provide training for professionals and personnel to promote and enable inclusive education at all levels of education (SEC. 1). THE GAZETTE OF INDIA EXTRAORDINARY 9.

(e) Establish enough resource centers to serve educational institutions at all levels of education.

(f) Encourage the use of augmentative and alternative modes of communication, such as Braille and sign language, to meet the daily communication needs of individuals with speech, communication, or language disabilities. This allows them to participate and contribute to their community and society.

(g) Offer free books, learning materials, and assistive equipment to students with benchmark disabilities up to the age of 18; (h) Offer scholarships to eligible students with the benchmark disability.

(i) Modify the curriculum and examination system to accommodate students with disabilities, including providing additional time for test completion, scribe or amanuensis services, and exemption from second and third language courses.

(j) Encourage research to increase learning; and (k) Implement further measures as needed.

Assistive technology

Inclusive education is valuable, yet it fails to meet the needs of some groups. Modern technology has

been successful in achieving this aim. In recent years, technologies like as screen reading software, text reading machines, talking mobile phones, drawing boards, geometric kits, cassette recorders, and digital recorders have revolutionized the lives of visually impaired individuals. They may act autonomously. Read and write in the generally used format.

Use several communication options, including e-mail, online chat, internet telephone, and instant messaging. Use the Internet for many activities, including reading newspapers and periodicals, banking, shopping, and accessing dictionaries, encyclopedias, and phone directories.

Screen reader software enhances computer accessibility for visually impaired users. Screen reading software, such as Challenged Jaws for Windows from Freedom Scientific USA, Window-Eyes from GWMicro USA, Hal from Dolphin UK, and Look Out by Premier Programming USA, use text-to-speech engines like Eloquence by Eloquent Technology, Microsoft Speech from Microsoft, Flex Talk from ATNT, and Deck Talk Access from Digital Equipments to generate speech output. Screen reader software reads text and text to speech (TTS) turns it into spoken words. Text-to-speech engines are responsible for proper text pronunciation, speech quality, and voice output. TTS is also utilized for automated telephonic inquiries and announcements. Both apps function in tandem.

Screen magnification software allows those with limited eyesight to use computers. Although Windows offers magnification, it is not adequate. It expands the whole screen, not just text. It also utilizes speech output. The keyboard and mouse are utilized for input.

Examples of screen magnification software include Magic by Freedom Scientific USA, Zoom Text by AiSquare USA, and Lunar by Dolphin UK.

OCR and scanners help visually impaired persons transform printed materials to digital formats. The scanner scans the document, which is then identified by OCR software. It is read by screen readers. Examples of OCR software designed for the blind include Kurzweil 1000 by Kurzweil Education Systems USA, Open Book by Freedom Scientific USA, and Complete Reading System by Premier Programming USA. Blind individuals may utilize general-purpose OCR software such as Omni Page Professional, Text Bridge, and Fine Reader with screen reading software.

An alternative output device for text-to-speech engines. Screen readers provide one-line information. It comes in cells of 20, 40, and 80. Braille screens are not widely utilized in underdeveloped nations due to their expensive cost.

Alva Access Group offers Alva Delphi Multimedia and Alva Satellite. Pulse Data Human Ware offers Braille Stars, whereas Paper Meyer Company in Germany offers Ellex. Power Some examples of refreshable braille displays are Braille by Freedom Scientific and Vario by Braum Germany.

The Braille note taker is a handheld gadget. It has a lengthy battery backup. It accepts Braille or QWERTY keyboard input and provides speech or refreshable Braille output. It may be linked to a PC for file backup. These devices have built-in applications for word processing, spreadsheets, contact books, clocks, calendars, e-mail, and internet surfing. Note-takers may link to a modem for internet access and Braille embossing. It is especially beneficial for visually impaired individuals in integrated education and employment settings. Some examples include Aria by Robotron Australia, Braille Desk

2000 by Arctic Technologies, Braille Lite Millennium, P ACmate, Type n' Speak, Type Lite, Braille n' Speak by Freedom Scientific, Braille Note & Voice Note by Pulse Data HumanWare, Braille Elba by Papenmejer Germany, and Arctic Technologies' Trans Type 2000.

A voice diary is a tiny handheld gadget that records sounds and stores data. Speech recognition enables users to search data saved on the device. It has several applications, including appointments, calendar, clock, calculator, address book, and note-taker.This gadget is offered in two models: Voice Diary by Voice Diary Ltd. in Israel and Voice Make by Parrot France.

Braille compared to other assistive technologies. Weikle and Hedadian (2004) adopt a different approach, arguing that the use of technology may prevent impaired children from developing necessary reading skills. Overreliance on technology may also lead to a loss in abilities. Educators' use of technology as a major, rather than supporting, method impacts their teaching of reading skills. Gale (2001) argues. It teaches listening skills as opposed to reading abilities.

Australian Braille Authority (1999). Researchers believe that technology can help visually impaired students study. Students' lack of access to technology, rather than assistive technology, is the root reason of poor academic performance. Abner, Lahm (2002).

There is a lack of understanding among instructors on providing dynamic training using assistive technology. Kentucky (U.S. research).

RESEARCH METHODOLOGY

Research Design:

Descriptive design refers to a quantitative study using a descriptive approach. The research examines students with visual impairments' perceptions on technology's role in education.

Sampling Technique:

Purposive: I gathered data from four blind schools in Delhi.

My sample size was eighty. I've gathered twenty examples from each school. My research used purposive sampling approaches. Data gathering methods include both primary and secondary sources. Primary data was gathered from four blind schools in Neem Ka thana, while secondary material was sourced from books, journals, research, and the internet.

Tools for Data Collection:

I utilized an interview schedule for data collecting. I posed questions directly to responders. Using assistive technology during interviews for the future. All respondents were male students in grades 9-12. The interview was conducted in both Hindi and English. The interview schedule was translated into Hindi for responses. Interviews were conducted in Hindi and subsequently translated into English. Data analysis was performed using Microsoft Excel 2007.

Data analysis.

The research was conducted at four blind schools in Neem Ka thana , with kids aged 9 to 12. The

study includes a socio-demographic profile and evaluates the impact of assistive technology on education and social inclusion.

Socio-demographic profile

The responders' ages suggest a negative outlook, with the highest being 23. The data shows that 27.84% of students are under the age of 16, while 31.64% are between the ages of 17 and 18. 40.50 percent of pupils are older than 18 years. The respondents are from rural areas and have a low socioeconomic status. Prejudices and stigma prevent further advancement. Currently, 96.21 percent of pupils speak Hindi, while 3.79 percent comprehend English. These schools use Hindi as their primary language of instruction.

The survey found that 5.06 percent of respondents were from scheduled tribes. 13.92 percent are from the schedule caste. 39.24% of pupils are from other backward classes (OBC). Approximately 41.77 percent of pupils fall into the general group. The majority of students in the field fall into the general group. They live in a remote location. Despite belonging to the broad group, individuals with disabilities face discrimination in society. Respondents acknowledged the prevalence of illiteracy in their hometown. Poverty is a significant barrier to involvement for people with disabilities. Schedule caste and tribal members experience twofold prejudice. The majority of people with visual impairments live in villages. According to statistics, 65.82 percent of people live in rural areas. In India, 18.98% live in cities, while 15.18% reside in semi-urban areas.

The survey reveals that 40% of moms are illiterate, whereas 26% have completed grades 1-8. 29 percent completed their education beyond secondary level. Only 2% of students graduate, with only 1% obtaining a master's degree. 40% of moms are illiterate, leading to a lack of awareness about healthy nutrition. Malnutrition is a leading cause of visual impairment.

Fathers' illiteracy rate is 13.92%. 18.98% of students completed upper primary education. After that, 48.10 percent completed their upper secondary education. Similarly, just 3.79 percent have completed a master's degree, compared to 15.18% who have graduated.

Poverty in families may be plainly seen. Approximately 60% of dads are self-employed and do not have additional income. Additionally, government employees often do mundane tasks. Some of them are teachers from middle-class families. The others will be considered poor. Visually impaired students have additional challenges in their education and job opportunities.

The government employs 21.58 percent of individuals, while 5.06 percent work in the private sector. Wherein Only 3.79 percent of moms work outside of their home. Among them, 1.26 percent work in Anganwadi, 1.26 percent are workers, and 1.26 percent are teachers. Approximately 96.20 percent are housewives. According to the research, moms continue to have restricted career opportunities. The research delves deeply into poverty. 51.89 percent are between 25000 and 50000. 18.98 percent of the population ranges between 50,000 to 100,000. 10.12% of persons fall between $100,000 and $150,000. 5.06 percent of persons fall between 150000 and 200000. 11.39 percent of persons fall between $200,000 and $300,000. 2.53% of persons are between 300000 and 350000. The respondents' poverty has become obvious. If we look at this data as monthly revenue, the results

would be far worse. The minimum income ranges from 2083 to 4166 rupees, with a maximum income of 25000 to 29166 rupees.

There are several software options available for visually impaired individuals to view books, periodicals, and journals across multiple platforms. Playing music and viewing videos. This research investigates its usefulness in educating schoolchildren. Respondents utilize different devices. Data suggests that 1.26 percent of pupils utilize tape recorders. CD players are utilized by 25.31 percent. Computers are valuable to 1.26 percent of pupils. 15.18% of students favor tape recorders and CD players.

Similarly, 15.18% of students utilize tape recorders, CD players, and Braille books. Braille books and CD players are beneficial for 10.16 percent of pupils. 3.79% of pupils utilized Braille books, computers, and CD players. 30.37% of persons utilize all equipment. The study indicates that although individuals are acquainted with computers, they lack the ability to utilize them effectively.

Blind kids still use Braille slate for writing. 44.30% of pupils utilized Braille slates, with 1.26 percent using Braille machines. 13.92 percent of pupils are comfortable using Braille slates and machines. 11.39% of persons use computers and Braille machines. Visually challenged pupils in grades 9-12 do not often utilize computers for writing. 29.11% of persons use Braille slates, machines, and computers. People like Braille slate because they are familiar with it. Although Braille machines are well known, not everyone has access to them. Many people are unaware of the Devnagri Hindi typeface and hence do not use computers for writing. Additionally, many lack understanding about the Safa Reader, which supports Hindi.

According to the study, 22.78 percent of pupils seek career-related information from their teachers.

Teachers are the primary source for them. 3.79 percent of students received this knowledge from their peers. 6.23% of students utilize radio as a source, whereas just 2.53% use the internet. 5.06 percent of pupils question professors and browse the internet. 11.39 percent seek help from friends, instructors, and the internet. 11.39 percent of students seek information about job opportunities via professors, friends, the internet, and radio. 2.53% of students utilize the internet, communicate with friends, and listen to the radio. 8.06 percent of respondents discuss work with their professors and friends. 16.45% of respondents listen to radio and engage with instructors and classmates. 5.06 percent believe in chatting with friends and listening to radio, whereas 26 percent speak to teachers and listen to radio.

Students have limited access to the internet, leading to poor use. Respondents said that they prefer to communicate in Hindi and so do not utilize the internet. Despite the availability of Hindi screen readers, many individuals are unaware of how to use them. Some responders explained that some websites are inaccessible to blind pupils due to graphics, frames, and screen reader compatibility issues. Students often inquire about their professors' careers. Although students recognize the benefits of the internet, their use remains restricted. According to data, 39% of individuals utilize school-provided internet. 49.46 percent access the internet by phone. 2.53 percent utilize a broadband connection. 2.53% of individuals use cyber cafes or other venues to access the internet. 1.26 percent of students use the internet and phone during school. 25.31 percent accessed by phone

and broadband. 5.06 percent access internet via phone or café. Respondents clearly use the internet on their phones. This implies that many keep the internet on their phones for emergencies. People who utilize broadband internet are wealthy.

The research examines how respondents do self-study. According to statistics, 46.83 percent of students utilize recording devices for studying. Screen readers were used in 51.98 percent of the studies. 1.26% of respondents use screen readers and magnification software. Those that utilize recording equipment record lectures in class. Additionally, they record all study materials in their recording device. Students who use screen readers copy all study materials to their computer. Some individuals who can read English choose to obtain books from the NCERT website and use JAWS.

Data gathering revealed that 73.41 percent of pupils use Jaws, with 5.06 percent using Orca and Nvda. 18.98% are acquainted with Jaws and Nvda. About 2.53 percent of pupils use screen readers such as Jaws, Orca, Nvda, and Safa. Data indicates that respondents are more acquainted with Jaws software due to its ease of use. They know how to use JAWS.

Respondents reported not having access to alternative screen reader software, despite its availability.

Scanning books allows visually challenged pupils to access printed materials on their computers. Scanners and software are used for this process. Two schools lacked scanners. Students are aware yet have inadequate scanning skills. According to the study, 30.37 percent of students struggle with document scanning and lack knowledge of scanners and software. 24.05 percent of respondents had average understanding about scanning software. 35.44 percent are excellent, indicating they understand how to operate. 10.12 percent of respondents are proficient at scanning. They said that they utilize it often. Students have diverse perspectives on the use of the internet in education. According to data, 7.59% do not believe the internet is useful for education and do not utilize it for this reason. 16.44% use the internet to some level. Respondents said that 32.91 percent utilize the internet to obtain relevant resources. 43.03 percent of respondents regularly utilize the internet and get its benefits.

Technology has been beneficial for those with disabilities. It facilitated education, employment, and social integration. My research investigated the inclusiveness of assessment technologies.

Data shows that 8.86% of respondents are unfamiliar with assistive technology. The vernacular difficulty becomes a hurdle. Approximately 20.25 percent of individuals utilize technology and social media. 60.75 percent utilize technology to connect with the globe. However, just 10.12% of students are regular users of all devices without accessibility issues. The study had a good reaction. According to the study, technology has led to 79.74 percent of kids feeling more autonomous. During the conversation, they said that technological advancements had led to more independence. They can access the internet autonomously, without relying on other parties. Customers may book train tickets and make purchases by putting orders. 20.25 percent of respondents lack independence because they do not utilize technology. According to the report, 81.01 percent of pupils believe in technology and identify as part of the mainstream. According to them, technology is reducing the world's size. We can communicate with anybody in seconds. I can communicate with loved ones globally. Despite the fact that 18.98% of respondents do not utilize technology, it has played a significant role in

connecting people worldwide. 40.50 percent of students have limited access to social networking websites at school. 39.24 percent reported having limited internet access due to limited time. They like browsing instructional websites. 12.65 percent use social networking sites like Facebook.

They spend more time because they like socializing with others. 7.59% visit these websites often and interact with friends. It also provides educational information. Additionally, it serves as a means for responders to communicate with their family members. 1.26 percent use the telephone. 73.41 percent use a cell phone. 12.65 percent use a telephone or a cell phone. 5.06 percent utilize phone, mobile, and social media sites. 7.59% utilize social networking websites. Research suggests that those who use social networking websites are more likely to have access to the internet via their phone or broadband connection at home, as well as having a higher socioeconomic status.

I also addressed their concerns using assistive technology. Only 6.32 percent of individuals have issues using screen readers. 93.67 percent of responders report no problems.

They can effectively use a computer using a screen reader. They're solely acquainted with JAWS. During the interview, they said that they seek assistance from low-vision pupils for any issues they may have. Approximately 7.59% of individuals have difficulty accessing the internet. 92.40 percent of respondents can readily access the internet. Students struggle with language barriers and limited access to websites. The survey focused on scanning, with 10.12% of respondents experiencing difficulties in scanning documents.

These kids are unfamiliar with scanners and scanning software. 89.87 percent do not have an issue. These pupils can scan.

Although they are familiar with the procedure, they often need assistance from poor vision students in adjusting scanner resolution and quality. Respondents have little difficulties sharing information with one other. They utilize mobile to share information with their peers. They utilize texting services. Some responders utilize Facebook and Google Groups. Only a small percentage (5.06%) struggle with sharing knowledge, whereas 94% have no issues.

CONCLUSION

Technology has significantly improved the lives of people with visual impairments worldwide. The scenario is steadily shifting as they successfully achieve their huge aims. My research indicates that school children are not as tech-savvy as the general population. Parents' illiteracy, lack of knowledge, and extreme poverty are barriers to their success. Discriminatory attitudes in society restrict parents from bringing out their children. Financial constraints prevent pupils from accessing cutting-edge assistive technology. Poverty and disability are often associated. These pupils can do better with more resources. The government should create policies that allow outstanding kids to enter the mainstream of society. If Braille books are not accessible, audible books should be used for secondary education.

Universities and institutions should post accessible books and papers on their websites. They should utilize Moodle, like Tata Institute of Social Sciences and other overseas institutions, to upload lectures for future use. All Indian universities and institutions must be digitized. Students with disabilities

should get multilingual instruction in school. Teachers must be well-versed in the requirements of people with disabilities and how to utilize assistive technology effectively. Institutions working in this sector should come forward. Also, support this movement. They should take responsibility for raising awareness to benefit both parents and future generations.

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