Advances in Consumer Research
https://acr-journal.com/
Volume-2 | Issue-6 | Dec: 2025
Original Researcher Article

Role of Assistive Technology in Fostering Inclusivity in School Libraries

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ABSTRACT
This article explores the evolving role of the school library as a central hub for assistive technology (AT), serving students with diverse learning needs. With the rise of digital tools and a greater emphasis on inclusive education, the modern school library is no longer just a repository for books but a dynamic, accessible space. The modern library is no longer a static repository for books but a dynamic, accessible space tailored to students with diverse learning needs. This paper discusses various forms of AT, including screen readers, text-to-speech software, and digital magnifiers, and examines their practical implementation within the library setting. It emphasizes the way that such technology can overcome obstacles for students with visual, auditory, and cognitive impairments in such a way that they can access materials independently and fully engage with the learning process. It contends that an active, long-term approach to addressing these challenges must be adopted, rather than mere equipment acquisition. It`s also addresses the challenges of integrating these technologies, such as funding, staff training, and ongoing technical support. Through selective incorporation of AT, libraries can enable all students to succeed, making the vision of inclusive education a reality for all. It argues that a proactive, long-term strategy is required to overcome these hurdles, advocating for a holistic approach that goes beyond simply acquiring equipment. .
Keywords: *Assistive Technology, Visual Impairment, Library, Adaptive Resources, Disabilities*
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1. INTRODUCTION:

Information in the life of an entity fosters influence; as such, it is important to the success of every aspiring individual, and it cannot be undervalued. Timely and credible information determines, to a very large extent, one's success and future development. Every person, regardless of status, race, gender, age, and physical challenge, deserves the right to access information for decision making and the creation of knowledge (Omah, Solomon, & Kente, 2023). The advent of the electronic age and breakthroughs in modern technologies have brought an array of Assistive technologies for special needs to use to search and get information in the library for effective service delivery (Joseph, et.al. 2025). The modern school library is undergoing a significant transformation, moving from a quiet, book-centric space to a vibrant and inclusive learning environment. According to Shonhe (2019) a library is an information and media resource centre located within the any institutions where library users have access to a variety of information resources. A library is defined as the learning workroom for excellence where users find the world of knowledge interact directly with resources, acquire information, literacy and develop research skills for life-long learning.

Assistive technologies are technologies that are specifically created, developed, and adapted or modified in a specific way to help people with special needs overcome challenges, enhance their functional independence, and be able to carry out tasks independently (Vincent, Okeowo, & Ariyo, 2024). Assistive technologies are available as hardware, software, and web-based resources, and can be computer hardware or software or an electronic device, including alternative formats of information (Alberta, Philip & Duffour, 2020). According to Alsolami (2022), the availability of the right digital assistive technology such as audiobooks engages and empowers students with disabilities to work independently. It is the duty of the library to ensure that all users with special needs are served just like those without special needs as stated by the second law of library "every reader, His or Her book'' (Loan, 2019) in other words, every library user should have access to the needed information.

Assistive Technology

In India, assistive technology refers to devices or software that improve the functional abilities of individuals with disabilities, thereby allowing them to participate in everyday activities, including education. (Yadav, 2024). According to Goddard (2018) Assistive technology is electronic and non-electronic or mechanical solutions that enable people with special needs to live independently. Assistive technology (AT) encompasses a broad range of devices, tools, and software designed to enhance the functional capabilities of individuals with disabilities. Its primary goal is to improve access to information, communication, and daily activities, thereby promoting independence and enhancing quality of life (Rajput, et.al. 2024). School Libraries serve as essential hubs for education, research, and personal development, yet many individuals with disabilities face significant barriers in

accessing information resources (Musa, Auwalu, & Hassan, 2021). However, despite advancements in digital accessibility and inclusive library services worldwide, challenges persist, particularly in developing nations, where infrastructural, financial, and policy-related constraints hinder the adoption of assistive technologies (Musa et al, 2021).There are so-called assistive technologies, i.e., audiobooks, talking books, reading apps, and other software, which are essentially devices designed to increase, maintain, or improve the functional abilities of people with disabilities. When appropriate for the user and their environment, they have been shown to be effective in improving independence and participation (WHO, 2011, p.101). However, their ability to access library resources effectively is often hindered by inadequate assistive technologies (Abubakar & Adebayo, 2021).

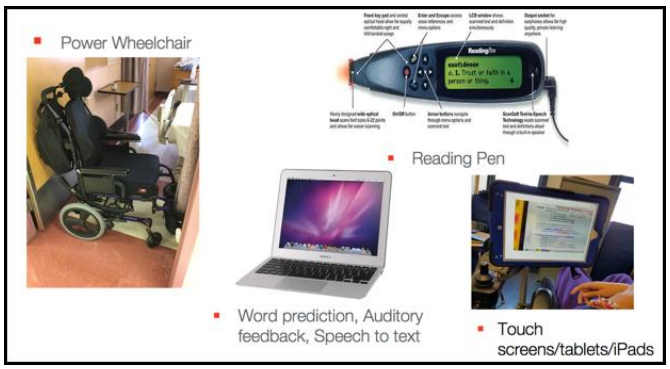

Fig.1
https://www.occupationaltherapy.com/articles/assistive-technology-to-improve-classroom-4313

2. LITERATURE REVIEW

Joseph, Damaris., Ushahemba, Oragbe., & Pantuvo, Maria Kannie (2025) Research at the American University of Nigeria examined the situation of assistive technologies (AT) for disabled library users. The study, conducted on seven librarians through a survey, showed low availability and utilization of AT. The observations indicated major challenges, such as inadequate funding, unavailability of technical know-how among the users and librarians, and inefficient power supply. The study found that the library is not well serving the special needs users and suggests that more AT be provided, enhanced staff and user training, and the production of awareness programs to promote more extensive use of the technologies.

Yadav, Anita. (2024) The idea of inclusive education in India has become more significant because of national and international legal systems. But even after progressive legislation, there are many gaps remaining, which can be filled by assistive technology (AT). This paper discusses the contribution of AT, ranging from low-tech touch materials to high-tech screen readers, in making students with disabilities a part of mainstream education.

Chaurasia, Abhay., & Singh, Ajay Pratap. (2022) the author discusses the library service study for disabled patrons draws attention to the necessity of employing software and hardware technologies in developing a barrier-free environment. The article insists that libraries must adopt technological developments in order to provide services to all users, following S. R. Ranganathan's philosophy as the "father of library science" in India. The study emphasizes that collaborative work with government agencies and NGOs is essential in facilitating libraries' access to the required resources and training professionals to meet the disabled patrons' needs effectively.

Potnis, Devendra., & Kevin, Mallary. (2021) the researcher conducted a study on assistive technology (AT) in U.S. university libraries by the author discovers a "service divide" where technology availability is not a predictor of use by disabled users. The researchers counted 51 challenges in five key areas: librarian expertise, hardware and software problems, institutional settings, budget, and external forces. The research, based on surveys completed by 186 public university librarians, confirms that the provision of AT is not sufficient. The findings, as seen from the perspective of the service provider, attempt to tell libraries how to create more user-centered services.

Dey, Supriya., Y, Vidhya. Et.al. (2019) In India, blind and partially sighted (VI) people are poorly represented in STEM fields, even though India has a large number of VI individuals and STEM graduates. An ethnography and multidisciplinary study concluded that the development of assistive technologies (AT) and information and communication technologies (ICTs) tends to neglect this problem for lack of integrative principles.

Pradhan, Sudipta., & Samanta, Mahadev. (2018) A comparative analysis of special schools in Medinipur and Burdwan divisions of West Bengal showed large differences in assistive technology (AT) and library facilities for visually impaired students. It was observed from the study that very few institutes, including Vivekananda Mission Assam and Asansol Braille Academy, have adequate resources and AT. The research also indicated a shortage of trained professional librarians, while underscoring the imperative of systemic reform in funding, policy enforcement, and employee training to provide fair access to education.

Bhatt, Ankita., & Kumari Archana (2015) Assistive technology (AT) contributes significantly to enhancing inclusivity and accessibility in libraries. A qualitative evaluation of literature identified AT tools such as screen readers, Braille displays, and speech-to-text software as highly effective in supporting user independence and access to resources. The research concludes that effective AT integration needs strategic planning and funding.

Sanaman, Gareema., & Kumar, Shailendra (2014) A survey of the status of assistive technology (AT) in libraries in India's National Capital Region (NCR) concluded that there is a wide gap in the provisions. The survey among 15 libraries reported that, although provision for blind users, especially in specialized institutions, is more common, there is a very little proportion of AT provisions for deaf/hearing-impaired and locomotor-impaired users. Findings revealed there was a distinct gap in the provision of both assistive

hardware and software across various categories of disability.

Blair, Vera (2006) the author conducted the study in which he studies on the idea of adaptive and assistive technology is a very old one, dating to the invention of such simple devices as eyeglasses. With the advancement of technology, these devices have become increasingly complex, transitioning from single-task mechanical devices to multifunctional electronic devices. These new technologies tend to be hardware-software hybrids with extensive support.

Role of Assistive Technology for Information Access

Assistive technology plays a crucial role in overcoming physical and cognitive barriers to education in India (Yadav, 2024). It serves as a bridge, revolutionizing the way individuals with physical, sensory, and cognitive disabilities interact with the world around them, from moving through a library to accessing more digital material. According to (Burke, 2013, 45) assistive and adaptive technology makes the library and its resources to or for users with disabilities as they play a major role in aiding persons with disabilities to access information resources in libraries. Access to the information is major problem for the disabled but today ICT along with assistive technologies have helped to reduce the digital divide between sighted and the blind by providing information on their desktop (Koganuramath and Chowkimath, 2009, p.619). The Samagra Shiksha Abhiyan, a government initiative aimed at enhancing inclusive education, has allocated funds for schools libraries to acquire assistive devices, which has improved access for students with disabilities in government-run institutions (Yadav, 2024). With 22 officially recognized languages and hundreds of dialects, assistive technology needs to cater to diverse linguistic requirements. Software like speech-to-text and screen readers are being developed in multiple Indian languages to bridge communication gaps for students with hearing or speech impairments **(Yadav, 2024)**. Government schemes like the Rashtriya Bal Swasthya Karyakram (RBSK) have also aimed to identify and support children with cognitive disabilities early, ensuring they receive the necessary AT tools during their formative years **(Yadav, 2024)**.

Fig3 Easter seals Crossroads https://youtu.be/Zzbe RdUq7g?si=jhQDs1Tk3pPlEF0T

Fig 2 https://stmartinparishlibrary.org/low-vision-assistive-technology/

Different Applications/Devices of Assistive Technologies of School Libraries

Ruby Sever Magnification Device- The Ruby Sever Magnification unit is an electronic, handheld video magnifier that is used to help persons who have low vision. It operates by taking a picture of text or an object using a built-in camera and projecting a greatly enlarged version on a digital display. The user can read books, newspapers, and product labels, or look at photographs and other materials that are hard to read with the naked eye. Its portable and light nature ensures that it is easily stowed in a bag or pocket, providing freedom and independence for activities at home, school, or when out shopping.

Fig 4. https://www.freedomscientific.com/products/lowvision/ruby/

Reader Plus (text to speech)- Reader Plus is a full-featured text-to-speech (TTS) program that provides access to written material for individuals with reading impairments, visual disabilities, or for anyone who wants to listen instead. It reads aloud digital text from a wide range of sources, including documents, websites, and e-books, in high-quality synthesized speech. Its capacity to produce audio content of written material contributes to democratizing access to knowledge, making it possible for anyone to learn and access content on their own.

Fig 5. https://iriscorporate.com/products/irispen-8/

Onyx OCR Desktop Magnifier for Old Books- The Onyx OCR Desktop is a high-powered video magnifier that is specially designed to help those with low vision read printed text, especially older books and papers. The desktop product integrates a high-resolution camera with an enlarged monitor and Optical Character Recognition (OCR) capability. The Onyx OCR stands out for aged books due to its high-level OCR feature. It has the ability to automatically translate the printed text into electronic form and read it out loud in a natural-sounding voice. This is particularly convenient for books with worn-out or torn print that may be hard to read even with the aid of magnification

Fig 6. https://www.nature.com/articles/s41433-021-01499-w

Brailey Printer- Braille printers, or embossers, are an essential part of an accessible school library, facilitating the transition from digital to physical information for visually impaired students. They transform digital text documents into a physical Braille format, making it possible for students to read a vast array of written texts. This technology enables students to read books, worksheets, handouts, and other written texts independently that are not present in pre-printed Braille form.

Fig 7. https://allyant.com/blog/what-is-a-braille-printer-embosser-why-is-it-so-important-in-accessibility/

Screen Readers: Programs such as JAWS (Job Access with Speech) or NVDA (Non-Visual Desktop Access) translate text and user interface components on a computer monitor into synthesized voice or Braille display. This enables students to browse the Web, read e-books, and utilize research databases.

6. Challenges in Implementing Assistive Technology

6.1 Funding and Resource Constraint-The most pressing and far-reaching challenge is the prohibitively high price of assistive devices. Technology such as customized screen readers, Braille printers, or sophisticated magnification systems tends to be highly expensive. Budgets for school libraries are usually constrained, and even a grant that is once-off may fall short of the long-term maintenance, repair, and software upgrade costs. In addition, staff training, which is crucial for successful implementation, also has to find a dedicated budget, which more often than not presents a challenging financial equation for most institutions.

6.2 Lack of Professional Training- Even when AT is present, its effect is diluted if librarians and teachers are not adequately trained. Librarians have little or no formal training or professional development regarding the use of assistive technology. Lacking a thorough understanding of how to use the devices and integrate them into a student's learning plan, the technology languishes unused. This leads to a wide gap between the technology's potential and actual implementation, ultimately unable to benefit the intended students.

6.3 Technical and Logistical Hurdles- Libraries tend to encounter all manner of technical and logistical problems. Some of these may be the irregular internet connectivity that is so vital to most digital AT tools, or the insufficient power points or charging points. Dealing with a variety of devices from various manufacturers can also be logistically cumbersome, causing compatibilities issues and a dearth of streamlined technical support. In most instances, IT departments are not prepared to manage the particular requirements of assistive technology, resulting in further delay and frustration.

6.4 Social and Cultural Barriers- There are also the more insidious, though no less significant, social and cultural issues. Even with the intention of inclusivity, the deployment of AT can sometimes result in stigma or isolation for students with disabilities. A student might

feel embarrassed about having to employ a device that publicly highlights his/her disability. Also, ignorance among classmates can cause misconceptions. Developing an inclusive environment is not solely about giving the technology but also about building an environment of acceptance and understanding across the whole school community.

7. Case Studies

The Rights of Persons with Disabilities Act (RPWD Act) of 2016 and the National Education Policy (NEP) 2020 both stress the importance of an inclusive and equitable learning environment for children with disabilities. The policies offer the legislative and philosophical context for incorporating AT into the mainstream education system. It transcends a medical conceptualization of disability, mandating the government legally to supply assistive technology and accommodation for students with disabilities. It also encourages Universal Design, making goods and spaces accessible to all. The ADIP Scheme under the Ministry of Social Justice and Empowerment offers the important financial support to disabled low-income individuals. It assists them in obtaining contemporary assistive technology, ranging from mobility tools to computer software, eliminating an important economic hurdle. Coupled with this is the Accessible India Campaign (Sugamya Bharat Abhiyan), which aims to provide a barrier-free environment. While emphasizing physical infrastructure, it also encourages accessible digital environments, such as public documents and government websites, to facilitate the use of AT on a daily basis.

3. CONCLUSION

Assistive technologies also help in meeting the expectations of the life of the disabled person so that they can lead their life normally (Carr, Gibson and Robinson, 2001). The school library's transformation into a hub for assistive technology is not merely a trend but a fundamental shift towards a more equitable and inclusive educational model. If libraries have adaptive technologies, they must advertise the fact as many users are not aware of the services being provided by the libraries for the people with disabilities (Lisiecki, 1999). It is not possible for any library to plan for every single patron's needs and selecting, installing and maintaining one or more of the most popular assistive software programs (Sanaman, 2014). The library staff should also consider adoption of a long-term strategy for planning for patrons with disabilities (McHale, 2007).

Therefore, before implementing new services to the library for the people with 4 disabilities, librarians need to refer to the various bibliographical sources dealing with the problems of providing library services to the disabled and to search the literature for research articles which describes the particular library's experience with the technological equipment in detail to assist them in their decision-making process (Bekiares, 1984).

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