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Research Article

Inclusion of Differently Abled Students in Higher Education through Modern Technology: A Comprehensive Analysis with Reference to RPwD Act 2016 and NEP 2020

Mahesh Shelke[1*], Priyanka Singh[2], Satyajit Baral[3], Mithila Biniwale[4], Krishn Kumar[5]

[1*]Department of Extension and Communication, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, mahesh.s-extcommphd@msubaroda.ac.in
[2]Centre for the Study of Social Exclusion and Inclusive Policy, School of Sciences, Jawaharlal Nehru University, New Delhi, prrajput39055@gmail.com
[3]Department of Education- CASE, The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat.
satyajit.b-edu@msubaroda.ac.in
[4]Dept. of Media and Communication, Dr. Vishwanath Karad MIT World Peace University, Pune, Maharashtra
mithila.biniwale@mitwpu.edu.in
[5]Department of Political Science, University of Lucknow, Uttar Pradesh, Krishnphd@gmail.com

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ABSTRACT

The integration of modern technology has significantly enhanced inclusive education for differently abled students in India's higher education system. Guided by the Rights of Persons with Disabilities (RPwD) Act of 2016 and supported by the inclusive vision of the National Education Policy (NEP) 2020, this research explores how technology fosters accessibility, equity, and empowerment. Tools such as screen readers, text-to-speech software, speech recognition systems, and adaptive devices like Braille displays and hearing aids are transforming learning environments. Digital platforms—e-books, online lectures, multimedia content, and virtual classrooms—enable flexible, interactive, and personalized learning experiences, removing many physical and structural barriers.

This study adopts a mixed-method approach involving a survey of 50 students with disabilities from Pune district of Maharashtra to understand how assistive technologies support their academic inclusion. The survey evaluates access to and effectiveness of digital tools, satisfaction with institutional support, and overall learning outcomes. Findings suggest that while technological advancements and national policies like the NEP 2020 have opened new pathways for inclusion, challenges remain in implementation and awareness. This research offers valuable insights and recommendations for institutions, policymakers, and technology developers to build a more inclusive higher education ecosystem.

Keywords: Modern Education, Inclusive Education, Disability, Social Incisiveness, RPWD Act 2016

Introduction

In the dynamic landscape of education, the quest for inclusive and equitable learning environments has gained momentum, especially for differently abled students. The integration of modern technology has emerged as a transformative force, redefining the boundaries of traditional education and fostering an inclusive paradigm. This essay delves into the pivotal role of modern technology in facilitating inclusive education for differently abled students within the higher education system in India, with a keen focus on the Rights of Persons with Disabilities (RPwD) Act of 2016.

Inclusive Education and the RPwD Act 2016:

Inclusive education, as stipulated by the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), advocates for the right of all individuals, regardless of their abilities, to receive quality education in mainstream settings. Recognizing the importance of this concept, India introduced the RPwD Act in 2016 to

supersede the erstwhile Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act of 1995. The RPwD Act encompasses a broader framework, mandating that higher education institutions create an inclusive ecosystem that accommodates diverse disabilities, promoting non-discrimination, equal opportunities, and access to education.

The Technological Revolution in Education:

The 21st century has witnessed an unprecedented technological revolution that has permeated every aspect of society, including education. Modern technology has revolutionized pedagogical approaches and opened new avenues for learners with disabilities. The emergence of assistive technologies, adaptive learning platforms, and digital resources has provided a lifeline for differently abled students in their pursuit of higher education. These technologies transcend physical barriers, enabling a personalized and flexible learning experience, thereby creating an environment conducive to inclusive education.

Empowering Differently Abled Students Through Assistive Technologies:

Assistive technologies are at the forefront of enabling inclusive education. Text-to-speech and speech-to-text software, screen readers, captioning tools, and braille embossers are just a few examples of tools that have transformed the learning landscape for visually impaired, hearing-impaired, and print-disabled students. These technologies bridge communication gaps, allowing students to access, comprehend, and engage with educational content on par with their peers. Moreover, modern communication tools, such as video conferencing and real-time collaboration platforms, facilitate remote learning, empowering students who may face mobility challenges.

Adaptive Learning Platforms:

Adaptive learning platforms leverage data analytics and artificial intelligence to tailor educational content and experiences according to each student's learning pace and style. For differently abled students, this technology offers a personalized learning journey that accommodates their specific needs. Such platforms adapt content formats, difficulty levels, and assessment methods, ensuring an optimal learning curve. This approach not only enhances understanding but also bolsters the confidence of differently abled students, as they can progress through the curriculum at their own rhythm.

Digital Accessibility and RPwD Act Compliance:

The RPwD Act underscores the importance of accessible educational materials. Modern technology plays a pivotal role in ensuring digital accessibility. Institutions are now required to provide electronic content that conforms to accessibility standards, making them compatible with assistive technologies. This proactive approach fosters a truly inclusive environment, reducing the barriers that differently abled students often face when accessing digital resources.

In essence, the fusion of modern technology and the RPwD Act 2016 has catalysed a paradigm shift in higher education in India. The journey toward inclusive education for differently abled students has been propelled by assistive technologies, adaptive learning platforms, and digital accessibility standards. As the country strives for equitable educational opportunities, it is imperative for higher education institutions to fully harness the potential of modern technology. This synergy not only complies with legal obligations but also aligns with the moral imperative of ensuring that every individual, regardless of their abilities, has unfettered access to knowledge and the transformative power of education.

Objectives

1. To examine the current utilization of modern technology for inclusive education in higher education institutions in India.
2. To understand the benefits and challenges associated with the integration of technology for differently abled students.
3. To identify the gaps in the implementation of technology-driven inclusive education.
4. To propose recommendations for enhancing the effectiveness of technology in promoting inclusive higher education in India

Research Methodology

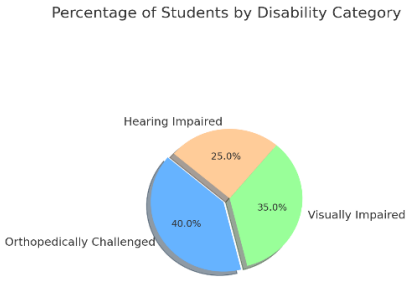
This study uses a mixed-method approach to understand how modern technology supports inclusive education for students with disabilities in higher education. The focus is on students who are orthopedically challenged, visually impaired, and hearing impaired. The research is based on the guidelines of the Rights of Persons with Disabilities (RPwD) Act, 2016 and the National Education Policy (NEP) 2020, which promote equal access to education for all. The study was carried out in the Pune district of Maharashtra, where 50 students from different colleges and universities were selected using purposive sampling. The participants included students from the three selected disability categories.

Data was collected through a structured survey designed to understand the use and effectiveness of assistive technologies. The survey included questions about access to tools such as screen readers, Braille devices,

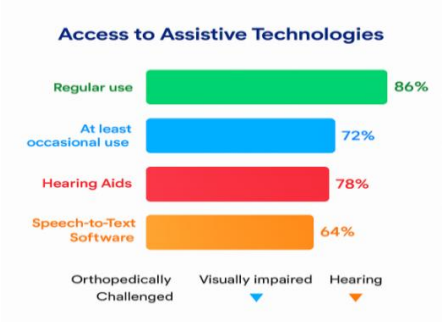
hearing aids, speech-to-text software, and mobility aids, along with how often they are used and how helpful they are in daily academic activities. Students were also asked about the support provided by their institutions and how these tools have affected their studies. Some open-ended questions allowed students to share their personal experiences and suggestions.
The collected data was analysed using basic statistics to understand general patterns, and open responses were reviewed to identify common themes and concerns. Observations made during visits to some institutions also helped assess the availability of infrastructure and the awareness of staff and teachers. By focusing on these three disability categories, the study aims to give clear insights into how technology is being used, what is working well, and where improvements are needed. The results will help colleges, policymakers, and developers make better decisions to improve inclusive education in higher institutions.

Result and Discussion

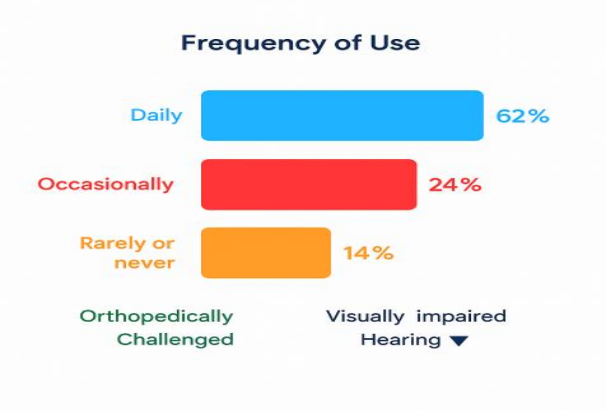
The study included a total of **50 students** with disabilities from higher education institutions in the Pune district. 40% of the participants were **Orthopedically Challenged,** making this the largest group. These students typically face mobility-related challenges and may use assistive devices such as wheelchairs, crutches, or mobility aids. 35% of the participants were **Visually Impaired**, including those with partial or complete vision loss. These students often rely on assistive technologies like screen readers, Braille devices, and audio materials for learning. The remaining 25% of participants were **Hearing Impaired**, facing challenges in accessing auditory information. They often benefit from technologies such as hearing aids, captioning tools, or speech-to-text software.



Access to assistive technologies varied among students with different impairments. A significant 86% of visually impaired students reported regular use of screen readers, while 72% used Braille devices at least occasionally. Among hearing-impaired students, 78% utilized hearing aids during lectures, and 64% reported using speech-to-text software. For orthopedically challenged students, 82% relied on mobility aids such as wheelchairs or walking sticks. However, only 38% of all participants had access to institution-provided assistive tools, with the majority depending on personal devices.



The frequency of use of assistive tools among students varied. A majority, 62%, reported using assistive tools daily for academic activities. Meanwhile, 24% used them occasionally, depending on course requirements or the availability of devices. The remaining 14% reported rare or no use, citing reasons such as personal preference or barriers in accessibility.



Accessibility was the most frequently mentioned issue, with students reporting difficulties in accessing course materials, physical infrastructure, and digital platforms. Students felt they needed better training to use assistive technologies effectively, and that faculty also required training to support them appropriately. Many students raised concerns about the lack of awareness among teachers and staff regarding the specific needs of differently abled learners. Internet access was highlighted as a barrier, particularly for those relying on online learning tools and platforms. Visually impaired students pointed out the need for improved Braille support and access to assistive devices. When available and functional, technology gave students a greater sense of independence in learning and campus participation. Students also expressed a desire for greater inclusion not only in academics but in extracurricular and social campus activities as well. These responses reflect student priorities and offer insights into areas where institutions can focus efforts to create a more inclusive environment.

Recommendations

• Enhance Institutional Provision of Assistive Technologies:
With only 38% of students having access to institution-provided tools, colleges and universities must invest in a wider range of assistive technologies (e.g., screen readers, Braille devices, hearing aids, mobility aids) to reduce reliance on personal devices and promote equitable access.

• Improve Accessibility of Learning Materials and Infrastructure:
Institutions should ensure that both physical spaces (e.g., ramps, elevators, accessible classrooms) and digital platforms (e.g., course portals, e-libraries) are fully accessible to all students, especially those with mobility and visual impairments.

• Conduct Regular Training for Students and Faculty:
Students expressed the need for better training in using assistive tools. Equally important is training faculty and staff on inclusive practices and the use of assistive technologies to better support differently abled students.

• Strengthen Internet Connectivity and Digital Access:
Since internet access is a key enabler for online learning and assistive software, educational institutions should provide strong, reliable Wi-Fi and ensure digital platforms are optimized for accessibility tools.

• Expand Braille and Audio Learning Resources:
Visually impaired students highlighted the need for better Braille support and audio-based learning materials. Institutions should ensure a steady supply of Braille textbooks, tactile graphics, and audio recordings.

• Promote Inclusive Campus Culture Beyond Academics:
Students expressed a strong desire for inclusion in extracurricular and social activities. Institutions should create inclusive programs, events, and clubs that actively involve students with disabilities to enhance their overall campus experience.

• Establish Support Centres for Differently Abled Students:
Setting up dedicated support or accessibility centres within institutions can provide one-stop assistance for technology access, counselling, training, and accommodations, fostering a more inclusive educational environment.

• Engage Students in Policy and Program Design:
Involving students with disabilities in decision-making processes regarding accessibility services ensures that institutional policies are aligned with their actual needs and priorities.

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