

Optimizing Information and Communication Technology for Students with Special Needs at India's Higher Education Institutions

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Abstract

Every person is entitled to a fair and just education and to be recognized as a vital member of the educational community, irrespective of their gender, race, colour, ethnic or social background, genetic characteristics, language, religion or belief, political or other viewpoints, involvement in a national minority, wealth, birth, or disability. Teachers should possess knowledge of Information and Communication Technology (ICT) and its potential in Higher Education to effectively address learning obstacles, enhance student retention rates and academic performance, and foster student autonomy and motivation to study. This study emphasized the concept of ICT, different ICT products, ICT applications, and the benefits of ICT for students with special needs.

Keywords: Information and Communication Technology, Students with Special Needs, Higher Education

Introduction

Education is essential for the whole growth of humans, particularly children. The collective endeavours of parents, teachers, and the government are concentrated on guaranteeing that youngsters get education of exceptional quality (Kaur, 2022). Education is a potent tool for advancing the social and economic empowerment of children with exceptional needs. It has great significance for these folks, who have traditionally experienced prejudice and exclusion (Nag, n.d.). While educating usually developing youngsters is generally simple, it poses an intricate problem for parents and teachers when it comes to children with special needs. Nevertheless, it is well recognized that emerging technologies, including Information and Communication Technology (ICT), has the capability to effortlessly and efficiently overcome challenges (Samadhan, 2015) and cater to the distinct requirements of kids with special educational needs.

Information and Communication Technology (ICT) provides solutions to address the gaps and reduce the shortcomings of students with special needs, allowing them to access information and engage with their surroundings. It aids in reducing their isolation by enabling communication and promoting social integration (Fytro, 2015, as mentioned in Kaur, 2022, p. 70). The Organisation for Economic Co-operation and Development (OECD) conducted a research in 2001 called "Learning to Change: ICT in Schools" which shows how ICT has a significant and positive effect on education and the learning experiences of students. Through the use of ICT, the achievement of effective learning for children with special needs becomes more feasible.

The crucial importance of ICT in facilitating education for children with special needs cannot be denied. According to Lozano, Alcaraz, and Bernabeu (2012), it is seen as a top concern in their educational system. Technology, notably Information and Communication Technology (ICT), is a fundamental part of contemporary education systems. The relevance of the Draft National Education Policy, 2016 is very important, and the work of committed instructors is equally crucial. The use of ICT enhances the ability to successfully meet the educational requirements of children with special needs, resulting in a more practical and significant learning experience.

Information and Communication Technology (ICT)

ICT stands for Information and Communication Technology. It refers to the use of technology to store, transmit, and manipulate information, as well as facilitate communication. ICT encompasses a wide range of technologies, including computers, networks, software, and telecommunications systems. It plays a crucial role in various aspects of modern life, such as education, business, healthcare, entertainment, and communication. ICT enables the efficient processing and exchange of information, leading to increased productivity, improved connectivity, and enhanced access to knowledge and resources (UNESCO, n.d.).

Special Need students

Within the field of education, the phrase “Special Needs students” (SNs) often denotes pupils who encounter difficulties as a result of their disability. Nevertheless, it is essential to acknowledge that the comprehension of SNs might differ depending on the context and criteria used to define them. When considering disabilities, special needs (SNs) refers to pupils with particular impairments such as hearing loss, intellectual disabilities, communication problems, visual impairments, locomotor disabilities, and other similar conditions. The requirements of social networks may be either long-lasting or transient, depending on the nature of their demands and, to some degree, the actions done to resolve their challenges. There is a diverse range of impairments that may affect people, with various levels of occurrence. The government recognizes several categories of impairments in order to provide essential assistance and privileges to those who need them. Currently, the RPWD Act 2016 in India has officially recognized a total of 21 impairments.

Special education

Special education is an educational method that is specifically designed to meet the distinct learning requirements of kids who have impairments. The purpose of this design is to guarantee that every student, irrespective of their disability, has equitable access to education and the chance to achieve their maximum capabilities.

Special education include the development of individualized education plans (IEPs) which delineate precise objectives, adaptations, and assistance services customized to meet the unique requirements of each student. These may include alterations to the educational program, unique pedagogical approaches, assistive technology, and supplementary assistance from educators, therapists, and other experts.

The main objective of special education is to provide a nurturing and all-encompassing educational setting that enables students with disabilities to develop their cognitive, interpersonal, and practical talents. The objective is to tackle the difficulties and obstacles that these kids may encounter by providing focused education and interventions.

Special education programs are available in several environments, such as segregated classes in ordinary schools, specialized schools, or resource rooms where children get extra assistance while mostly attending regular classrooms.

Information and Communication Technology for Special Need Students

Simon (1991) asserts that technology's genuine miracle is in its capacity to assist those with impairments in surmounting previously insurmountable difficulties. Information and Communication Technology (ICT) has a crucial role in fostering autonomy for children with special needs, enabling them to do things that were previously unattainable. An instance of this is the creation of a wearable computer that is specially tailored to provide a means of communication for youngsters who have learning impairments. Assistive technology refers to a variety of equipment and services designed to aid those with impairments. An assistive technology device is a piece of equipment that helps persons enhance, maintain, or improve their functional capacities.

Assistive technologies (ATs) may be classified into three distinct groups:

- a) No-tech tools
- b) Low-tech tools
- c) High-tech tools

These technologies are used along with tailored techniques to address the specific requirements, capabilities, and assignments of individual students.

Assistive Technology for Children With Special Needs

Assistive technology is essential for aiding children with special needs by equipping them with tools and resources that improve their learning, communication, mobility, and general self-sufficiency. Below are many examples of assistive technology designed specifically for children with special needs:

- 1. Communication Devices:** Augmentative and alternative communication (AAC) equipment, such as speech-generating gadgets and communication applications, assist children with speech difficulties in efficiently communicating.
- 2. Hearing Aids and FM Systems:** Hearing aids are devices that increase the volume of sound for children who have difficulty hearing. FM systems, on the other hand, enhance their capacity to perceive and comprehend speech in loud surroundings.
- 3. Visual Aids:** Visual aids such as Braille devices, screen magnifiers, and screen reading software help children with visual impairments to access information and interact with digital material.
- 4. Adaptive Computer Input Devices:** Adaptive computer input devices, such as modified keyboards, switches, and eye-gaze systems, allow children with physical limitations to use computers and engage with digital interfaces.
- 5. Educational Software and Apps:** Educational software and applications designed specifically for children with special needs provide interactive learning experiences, adaptive learning material, and skill-building exercises that are customized to meet their individual need.
- 6. Mobility Devices:** Mobility devices such as wheelchairs, walkers, and mobility scooters help children with mobility limitations by allowing them to move about on their own and take part in different activities.

7. **Sensory Integration Tools:** Weighted blankets, sensory swings, and tactile toys are used to assist children with sensory processing disorders in managing their sensory input, hence enhancing their ability to concentrate and self-regulate.
8. **Environmental Control Systems:** Environmental Control Systems empower children with physical limitations to manipulate their surroundings, including lighting, appliances, and temperature, via the use of switches or voice instructions.
9. **Prosthetics and Orthotics:** Tailor-made prosthetic limbs and orthotic devices enhance the mobility and functioning of children with limb differences or musculoskeletal abnormalities.
10. **Assistive Listening Devices:** Assistive Listening Devices, such as personal FM systems or sound amplifiers, improve the auditory experience for children with hearing impairments in schools or other environments with high levels of noise.

It is crucial to consider that the choice of assistive technology should be determined by individual requirements, preferences, and evaluations carried out by specialists such as educators, therapists, and healthcare practitioners. The objective is to provide the most suitable assistive technology solutions that enable children with special needs to achieve their maximum capabilities and actively engage in their educational and everyday endeavours.

Benefits of ICT for Special Need Students

Information and Communication Technology (ICT) provides a multitude of advantages for children with special needs. ICT offers numerous substantial advantages for children with special needs, such as:

1. **Accessibility:** ICT offers inclusive tools and technology that accommodate diverse disabilities, including vision impairments, hearing impairments, and physical disabilities. It empowers children with special needs to have equal access to information, communication, and educational activities alongside their classmates.
2. **Personalized Learning:** Information and Communication Technology (ICT) enables customized learning experiences by adapting to the individual requirements and capacities of each student. The platform offers personalized and engaging educational material, allowing students with special needs to study at their preferred speed and in alignment with their unique learning preferences.
3. **Communication and Social Interaction:** Information and Communication Technology (ICT) enables special needs students to engage in communication and social engagement. The platform provides assistive technology, including AAC devices and communication applications, to help children with speech problems express oneself while engaging in discussions with others.
4. **Inclusion and Participation:** ICT facilitates inclusion and participation by empowering students with special needs to actively participate in classroom activities, collaborative projects, and group discussions. It facilitates the bridging of communication barriers and promotes connection with classmates and instructors.
5. **Skill Development:** ICT offers special needs kids the chance to develop fundamental skills like digital literacy, problem-solving, critical thinking, and creativity. It provides instructional software, applications, and games that facilitate the development of skills in an enjoyable and captivating way.
6. **Independence and Empowerment:** Information and Communication Technology (ICT) enables students with special needs to gain greater independence in their educational and everyday tasks. The company provides assistive technology, mobility aids, and environmental control systems that enable children to independently manage their surroundings, access information, and carry out activities.

7. **Multi-sensory Learning:** ICT provides educational experiences that engage several senses, including sight, hearing, and touch. This is advantageous for kids with sensory processing problems or learning difficulties, since it improves their level of involvement and comprehension.
8. **Access to Resources and Support:** ICT offers access to an extensive range of instructional materials, online learning platforms, and support networks. It facilitates the connection between kids with special needs and educators, therapists, and communities that provide specialized support and guidance.
9. **Motivation and Engagement:** Information and Communication Technology (ICT) often improves the motivation and involvement of students with special needs in the learning process. Interactive multimedia, gamified learning, and educational applications have the potential to enhance the learning experience by making it more fun, hence boosting engagement and improving knowledge retention.
10. **Bridge Physical Barriers:** Information and Communication Technology (ICT) assists in overcoming physical obstacles that may otherwise restrict the educational possibilities available to children with special needs. It facilitates distance education, video conferencing, and virtual classrooms, guaranteeing that students with special needs can obtain education and assistance irrespective of their physical location.

Through the use of Information and Communication Technology (ICT), children with special needs may overcome obstacles, optimize their capabilities, and actively engage in educational opportunities alongside their classmates.

RECOMMENDATION

Introducing Information and Communication Technology (ICT) in higher education for special needs students in India necessitates careful examination of the distinct obstacles and advantages specific to the Indian context. Here are some specific recommendations specifically designed for the context of higher education in India:

1. **Awareness and Sensitization:** Organize awareness campaigns and training sessions targeting professors, staff, and students to cultivate comprehension and empathy towards students with special needs.
2. **Accessible Infrastructure:** Guarantee that campuses and ICT facilities are physically reachable for students with impairments, including features such as ramps, elevators, and accessible bathrooms.
3. **Local Language Support:** Create and integrate information and communication technology (ICT) solutions that facilitate the use of Indian languages and scripts, taking into account the wide range of linguistic variations in the nation.
4. **Government Initiatives:** Utilize government programs and efforts such as the Rights of Persons with Disabilities Act, 2016, and the Accessible India Campaign to enhance accessibility and inclusivity in higher education.
5. **Collaboration with NGOs and Specialized Centres:** Engage in partnerships with non-governmental organizations (NGOs) and specialist centres for disability assistance to acquire knowledge, exchange resources, and create inclusive information and communication technology (ICT) solutions.
6. **Low-Cost Solutions:** Explore or create cost-effective ICT solutions that are accessible to both educational institutions and students, taking into account the economic disparities in India.
7. **Multimodal Content:** Providing instructional material in diverse media such as written text, audio, and video to accommodate varied learning styles and sensory preferences, and guarantee that this material is accessible in local languages.

8. **Accessible Online Learning Platforms:** Utilize learning management systems (LMS) and online platforms that are easily accessible, adaptable, and compatible with mobile devices to accommodate students with different impairments.
9. **Digital Libraries:** Develop and sustain digital libraries containing a diverse array of easily available items, such as educational textbooks, scholarly articles, and study aids.
10. **Community Engagement:** Engage parents, guardians, and local communities in assisting special needs students and seek their feedback on ideas for using information and communication technology (ICT).
11. **Financial Support:** Explore and study scholarships and financial assistance initiatives which aimed at increasing the accessibility of higher education for special needs students, particularly those from less fortunate backgrounds.
12. **Research and Evaluation:** Conduct periodic research to assess the efficacy of ICT initiatives and gather input from students and teachers to identify and implement required enhancements.
13. **Support Services:** Provide a wide range of support services, such as assistive technology laboratories, counsellors, and mentors, to ensure the social and educational achievement of students with special needs.
14. **Legal Compliance:** Ensure that all ICT implementations adhere to the legal requirements of India regarding disability, including the Rights of Persons with Disabilities Act, 2016.
15. **Student Involvement:** Ensure the active participation of students with special needs in decision-making processes and solicit their feedback on information and communication technology (ICT) solutions, since they are the main recipients of these remedies.

By adhering to these suggestions, Indian higher education institutions may provide a more comprehensive and easily accessible learning atmosphere, allowing students with special needs to engage in higher education and make valuable contributions to society.

CONCLUSION

To summarize, Information and Communication Technology (ICT) has significant potential to revolutionize the educational experiences of children with special needs. ICT enables students with special needs to overcome obstacles and unleash their maximum capabilities by using user-friendly tools, tailored learning methods, and adaptable technology. ICT facilitates the creation of learning environments that are inclusive and engaging, which in turn promotes communication, social interaction, skill development, and independence for children with disabilities. ICT provides advantages that go beyond the classroom, serving as a connection to resources, support networks, and possibilities that were previously unattainable. In order to fully utilize the transformative potential of technology and create an educational environment that is inclusive and empowering for students with special needs, it is essential to prioritize equitable access, ongoing research, and collaboration among educators, parents, and professionals in the field of ICT.

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