

**ASSISTIVE TECHNOLOGY FROM THE PERSPECTIVE OF
SPECIAL EDUCATION:
A LITERATURE REVIEW**

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Abstract—This paper aims to explore and investigate the various aspects and role of assistive technology to improve the learning ability of the specially able student. As there are different kinds of pedagogy and methodologies which are used for purpose of learning in National and International Institutions across the world, it becomes quite harder for mild and moderates disabled peers to compete with the general pupil. Adaptive and assistive technology plays a vital role and tries to bridge the gap of the way of learning which provides an opportunity to participate in the field of learning. The main hurdle in the transformation of technology is lack of dissemination of knowledge of assistive technology among the targeted audience. There are lots of initiatives and projects launched by the government of India for empowering specially able students. Assistive Technology provides different tools and devices which will be beneficial for the people with mild and moderate disabilities.

Keywords— AT, ADHD, OCD, ICF, AAC.

I. INTRODUCTION

As per the census 2011, there were 2.68 Crores persons with disabilities are recorded, which was 2.21 % of total population in India. From the perspective of special education, it is expected that some sort of support is required to impart in the field of special education. Technology is a hope for educators and their parents which enables to provide support for the students with special needs and in turn overcome the many difficulties in offering the education. Based on the specific requirement of a particular student, it is necessary to provide a customized solution based on specific requirements. As per International Classification of Functioning, Disability, and Health, also known as ICF, defines disability into various physical (visual impairment, hearing loss, poor manual dexterity) and mental impairments (Autism, Attention-Deficit/Hyperactivity Disorder (ADHD), Obsessive-Compulsive Disorder (OCD)) that can hamper or reduce a person's ability to carry out his day to day activities [1].

An Assistive Technology (AT) device is defined as assistive technology at 1998 as “Any item, piece of equipment or product system, whether acquired commercially off the shelf, modified; or customized i.e. used to increase, maintain or improve the functional capabilities of children with disabilities” (Assistive Technology Act 2004). Adaptive and Assistive technology plays a vital role in providing solutions based on specific set of requirements such as Audio Player and Recorder, timer, talk typer and augmentative and alternative communication devices. There are many factors which affect the successful deployment of the technology such as lack of awareness, lack of timeline data for analysis and outcome. [2] Apart from the devices and technology available, it is a prime concern to focus on the research and provide training to educators so that the objective of improved learning can be achieved.

Often children are admitted to special schools without proper assessment of their educational needs and the resources are not available to provide them with an appropriate range of experiences.

II. Categories of Assistive technology

On the basis of some parameters like power or battery consumption and use of digital technology, cost, Assistive Technology can be broadly categorized into Low-technology, Mid-technology, and High Technology. In the Low-technology category, no power source is required as well as cost is also low with respect to mid and high-technology expect in very few cases where very low power consumption is required. e.g. Keyboards for tablets, Headphones, Tablet Accessories

In Mid-Technology category, power source or battery is required for usage of mid-tech devices e.g. Livescribe Pen and in High-Technology Category, High power consumption is required for usage of high-technology devices. Mainly computer-based digital device fall into the category of High –Technology Category e.g. Tablets themselves: Nexus 10, Kindle Fire HD, and iPad [3]

Assistive technology refers to any type of product, design, information or modified versions of products that are used to improve functional capabilities of individuals with disabilities. While adaptive technology is developed exclusively for the disabled that includes products or design specifically designed for persons with disabilities. These technologies are used mainly for wayfinding and for overcoming their insecurity in society by being able to access everything they need. When a person with disabilities is able to work out things by himself without the need for external assistance, then it proves to show Universal consideration and provides an equal status of living in all possible forms. [4]

TABLE I: DIFFERENT TYPES OF DISABILITY AND CORRESPONDING ASSISTIVE TECHNOLOGY

S.No.	Type of disability	Assistive Technology
1.	Disability that affects mobility	Wheelchair, cane, scooter, crutches, prosthetic devices, ramps, automatic door openers, grab bars, and wider doorways, ramps, automatic door openers, grab bars, and wider doorways, orthotic devices
2.	Hearing Disability	Closed Captioning, Sound-Field Systems
3.	Brain injury	Cognitive assistance, computer or electrical assistive devices
4.	Mobility and Sensory Impairments	voice recognition programs, screen readers, and screen enlargement applications
5.	Disabilities to participate in educational activities	automatic page-turners, book holders and adapted pencil grips
6.	Dyslexia	Ginger, Ghotit(correcting words frequently misspelled by students)
7.	Paralysis and fine motor skill disabilities	Jouse3
8.	Anxiety	Soothers / Comforters
9.	Agitation	Distracters / Disrupters
10.	Memory	Reminders / Schedulers
11.	Risk Behaviours	Safety / Monitoring
12.	Therapeutic	Mood Trackers / Screeners
13.	Communication Disorder (aphasia, traumatic brain injury)	Augmentative and alternative communication (AAC)

III. Issues and Challenges in the implementation of Assistive Technology

There are many challenges related to the implementation of adaptive and assistive technology. These are as follows-

- Lack of Training- Assistive technology is designed for the specially-abled people to fulfill their educational need which is only possible when their mentors/trainers/educators are well trained and familiar with assistive technology which in turn could be beneficial for their needs.[5]
- Assessment Issues- It is not possible to compare the specially-abled students with normal students keeping this fact in mind there is need to modify evaluation method for specially-abled students.[5]
- The high cost of research with the limited market population doesn't attract manufacturers.
- Time Constraints- Time required for training of teachers, students as well as the time needed for installation and procurement of devices[5]
- Lack of faculty knowledge in AT:- There is no formalized method available so that the skills are addressed, it is solely up to the professor's own knowledge and interests.[13]
- Perception that AT is only important for students with certain type of disability:- AT is offered only in specified disciplines.[13]

IV. Analysis of different types of disability in Chhattisgarh

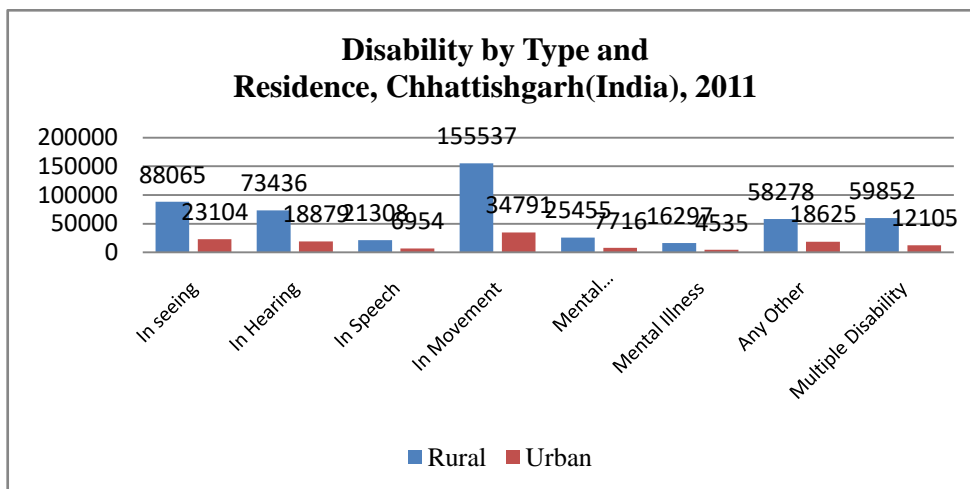


Fig.1 Percentage of Disability type with respect to Urban and Rural Area of Chhattisgarh

Considering the census data 2011 of Chhattisgarh (India). The empirical data analysis shows the fact that the different types of disabilities have more effect in rural areas in comparison to the Urban areas. Specifically, the movement type and seeing- a type of disability have more effect in the rural area. Whereas in Urban areas, movement and seeing type of disability are having more effect. The main concern is due to the fact that there are cases which are not specified like the Any Other category which has to be identified and categorized in the appropriate category.

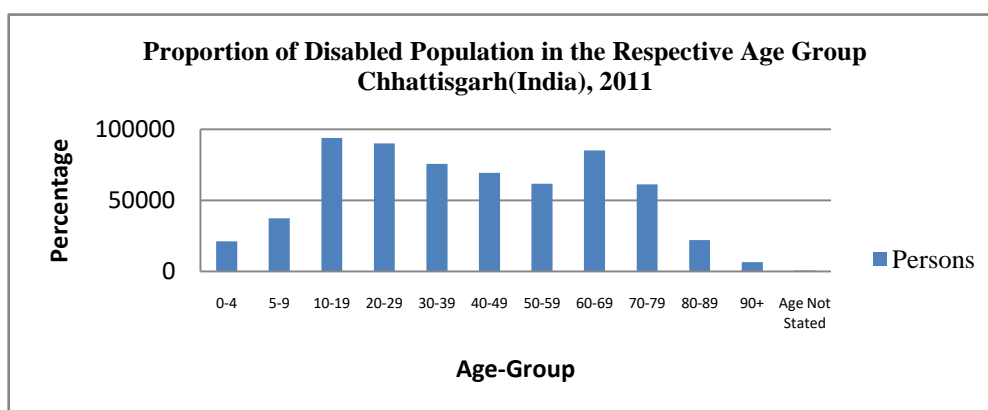


Fig.2 Percentage of Disabled Population with age groups Chhattisgarh

The figure illustrates the fact that the age-group 10-19 and 20-29 is highly under the effect of disability and prone to disability. As the age group increment there is fall in trend with respect to age-group but after the age of 59, there is tremendous growth in the percentage of disability. So evidently there are two modes in the distribution of the chart. So, ultimately, there is more impact in the 10-19 and 60-69 age-group.

V. Government Initiatives for the empowerment of persons with disabilities:

To safeguard the rights of persons with disabilities, the office of the chief commissioner for persons with disabilities is established under the Section 57 of persons with disabilities act. The act facilitates establishment on their behalfs such as prevention and early detection of disability. To provide education, employment, social security and manpower development. Data Gathering is one of the main issues which hinder to determine the status of disability in India. It is necessary to have sample time lined survey data with respect to the different types of disabilities so that different measures and actions could be imparted to avoid the various problems related to disabilities.

1. Swavalamban Health Insurance Scheme: Objective of this scheme are-

- a) "To provide affordable Health insurance to persons with 'Blindness, low vision, Hearing impairment, Mental illness etc.'
- b) to improve the general Health condition & quality of life of persons with disabilities." [6]

2. Deendayal Rehabilitation Scheme (DDRS): The Scheme aims to create an enabling environment to ensure equal opportunities, equity, social justice and empowerment of persons with disabilities, by encouraging voluntary action. NGOs are given assistance under the Scheme for providing a wide range of services to persons with disabilities, such as (i) Programme for pre-school and early intervention (ii) Special education (iii) Vocational training and placement (iv) Community-based rehabilitation (v) Manpower development (vi) Psycho-social rehabilitation of persons with mental illness (vii) Rehabilitation of leprosy-cured persons, etc.[7]

3. Unique Disability ID(UDID Plan):- It is an integrated system for issuance of Universal ID and Disability Certificate for Person with Disabilities. The project is initiated by Department of Empowerment of Persons with Disabilities.[8]

4. Scheme for Implementation of Persons with Disabilities Act,1995 (SIPDA Scheme):- For rehabilitation and support of persons with disabilities wide range of grant-in-aid are provided such as ramps, lifts, tactile paths, new product development and research under this Act. State Government and various other bodies are provided grants-in-aid set up by Central and State Governments.[9]

5. Corporate Social Responsibility (CSR) Projects:- For the empowerment and rehabilitation of persons with disabilities innovative projects are imparted for positive impact and inclusive growth of differently abled people.[10]

The government has taken many initiatives like awareness programs in different categories of disabilities such as cerebral palsy, spinal cord injury, post-stroke, hemiplegia, muscular dystrophy etc.[11] For the purpose of inclusive education, the government has launched different schemes, benefits like life insurance, National Handicapped Finance and Development Corporation and certificate courses[12].

VI. CONCLUSIONS

There is need to do a lot in the field of special education beginning with the data collection/gathering and making it available for empirical research. There are many possibilities which can take assistive technology to the next level e.g. adaptive technology which could provide a solution to a group of individuals. The government has taken initiatives regarding that dissemination of information about awareness of different kinds of disabilities. Because one solution cannot fit all, it is necessary to provide customized solution to the people in need. There is need to move into the direction of innovative solutions and provide time constrained solution based on the imperial data analysis. The major population of rural regions is heavily affected by disability types of disability in comparison to the urban areas. Lack of knowledge and awareness among the people is a major concern due to which many schemes and plan are not able to outreach the target audience. However, the role of assistive technology is the one way of providing a solution to the specially-abled people and creates an opportunity to grow and compete. For the enhancement of the lifestyle and improve the ability to learn, assistive technology opens the doors of opportunities.

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