Chapter I
Introduction

1.1 Introduction

Inclusive education has become a global priority, with the aim of providing equitable learning opportunities for all students, irrespective of their abilities or disabilities (United Nations Educational, Scientific and Cultural Organization, hereafter UNESCO, 2020).

In India, the Rights of Persons with Disabilities (RPWD) Act, 2016 mandates the provision of inclusive education and reasonable accommodations for students with disabilities. RPWD Act, 2016 defines inclusive education as a 'system of education wherein students with and without disabilities learn together and the system of teaching and learning is suitably adapted to meet the learning needs of different types of students with disabilities' (Chapter 1, Section 2, Page no. 6).

Additionally, the Right of Children to free and compulsory Education (RTE) Act 2009, which was amended in 2012 to include children with disabilities under its purview, emphasises the right to free and compulsory education for all children aged 6 to 14 and for children with disabilities up to 18 years, ensuring that no child is left behind due to disability.

National Education Policy 2020 is in complete consonance with the provisions of the RPWD Act 2016 and endorses all its recommendations with regard to school education. Particularly Theme 6 on Equitable and Inclusive Education,

underscores the importance of integrating all learners, regardless of their socio-economic background or physical abilities, into the mainstream education system

One crucial aspect of ensuring effective inclusive education is the use of assistive devices, which are tools or technologies designed to enhance the functional capabilities of individuals with disabilities (World Health Organization WHO, 2018).

Assistive device(AD) is defined as any device or items that can be used to increase, maintain or improve the capabilities of individuals with disabilities (Individuals with Disabilities Education Act, IDEA 2004). Assistive devices can play an important role in special education because many students with disabilities need special instructional treatment. A number of assistive devices and software are available that, with careful planning and guidance, can benefit students with disabilities (Duhaney & Duhaney, 2000).

Technological intervention within special education has a long history. It began with the funding of assistive devices in 1967 by Education for the Handicapped Act. The IDEA (Individual with Disabilities Act) requires schools to provide assistive technology services and equipment for a student with a disability to ensure a “free and appropriate” public education. The reauthorization of IDEA (1997) mandated AD to be included into the Individual Education Program (IEP). In 2001, with the passage of No Child Left Behind (NCLB).

1.2 Common types of assistive device

Assistive devices range from simple, low-technology devices (e.g. walking sticks or adapted cups), to complex, high-technology devices (e.g. specialised computer software/hardware or motorised wheelchairs). It is helpful to consider this wide variety of assistive devices under different categories.

Mobility devices

Mobility devices assist people to walk or move and may include:

- wheelchairs
- tricycles
- crutches
- walking sticks/canes
- walking frames/walkers.

Mobility devices may have specialised features to accommodate the needs of the user. For example, a person with cerebral palsy may require a wheelchair with trunk/head supports to ensure he/she is able to maintain a good sitting position. The WHO guidelines on Provision of manual wheelchairs in less resourced settings (35) are a useful reference for those people involved in the design, production and distribution of wheelchairs.

Positioning devices

People with physical impairments often have difficulty maintaining good lying, standing or sitting positions for functional activities and are at risk of developing deformities due to improper positioning. The following devices can help overcome some of these difficulties:

- wedges
- chairs, e.g. corner chairs, special seats
- standing frames.

Prosthetics, orthotics and orthopaedic shoes

These are usually custom-made devices which replace, support or correct body parts. They are designed, manufactured and fitted in specialised workshops or centres by trained prosthetic/orthotics personnel and include:

- prostheses, e.g. artificial legs or hands
- orthoses, e.g. spinal braces, hand/leg splints or callipers
- orthopaedic shoes.

Daily living devices

These devices enable people with disabilities to complete the activities of daily living (e.g. eating, bathing, dressing, toileting, home maintenance). There are many examples of these devices, including:

- adapted cutlery and cups
- shower seats and stools
- toilet seats and frames
- commodes
- dressing sticks.

Vision devices

Low vision or blindness has a great impact on a person's ability to carry out important life activities. A range of devices (simple to complex) can be used to maximise participation and independence, including:

- large print books
- magnifiers
- eyeglasses/spectacles
- white canes
- braille systems for reading and writing
- audio devices, e.g. radios, talking books, mobile phones

- screen readers for computers, e.g. JAWS (Job Access with Speech) is a screen reader programme.

Hearing devices

Hearing loss affects a person's ability to communicate and interact with others; it can impact on many areas of development, e.g. speech and language and restricts educational and employment opportunities, resulting in social discrimination and isolation. Devices include:

- hearing aids
- headphones for listening to the television
- amplified telephones
- TTY/TTD (telecommunication devices)
- visual systems to provide cues, e.g. a light when the doorbell is ringing.

Communication devices

Augmentative and alternative communication devices can assist individuals who have difficulty understanding and producing speech. They are provided to support speech (augmentative), or to compensate for speech (alternative). Devices include:

- communication boards with pictures, symbols or letters of the alphabet

- request cards
- electronic speech output devices
- computers with specialised equipment and programmes.

Cognitive devices

Cognition is the ability to understand and process information. It refers to the mental functions of the brain such as memory, planning and problem-solving. Brain injuries, intellectual impairment, dementia and mental illness are some of the many conditions that may affect an individual's cognitive ability. The following devices can assist individuals to remember important tasks/events, manage their time and prepare for activities:

- lists
- diaries
- calendars
- schedules
- electronic devices, e.g. mobile phones, pagers, personal organisers.

1.3 Assistive devices and applications developed in India for Divyangjan

Saksham Trust

Saksham Trust is a pioneering organisation in India dedicated to empowering visually impaired individuals through education, training, and the provision of assistive technologies. The trust develops and distributes a range of innovative devices.Some applications and AD, developed by Saksham trust are as follows:

i) Smartcane: An electronic travel aid designed to help visually impaired individuals detect obstacles using ultrasonic sensors.

ii) Refreshable Braille Notetaker: A device that converts digital text into Braille, allowing visually impaired users to read electronic documents.

iii) DAISY Players: These devices play DAISY (Digital Accessible Information System) books, providing audio and navigational support for visually impaired users.

iv) Talking Devices: Includes talking watches, talking thermometers, and talking weighing machines that vocalise information for the visually impaired.

v) Saksham App: This app provides a repository of information for visually impaired individuals, including details on assistive technology, training modules, and key government policies

Central Institute of Educational Technology (CIET)

CIET, a constituent unit of the National Council of Educational Research and Training (NCERT), aims to bridge the digital divide and ensure that all students, regardless of their abilities, have access to quality education. CIET develops digital content, educational apps, and multimedia resources like PRASHAST - 'A Disability Screening Checklist for Schools' booklet and mobile app covers the 21 disabilities, including the benchmark disabilities as per the RPWD Act 2016. This initiative facilitates early screening, leading to certification of Children with disabilities, as per the provisions of Samagra Shiksha to support inclusive education.

Useful softwares for Divyangjan

i) Screen Readers: Software like JAWS (Job Access With Speech) and NVDA (NonVisual Desktop Access) that read out the text on the screen for visually impaired users.

ii) Magnification Software: Tools such as ZoomText that magnify text and images on a computer screen, helping users with low vision.

iii) Voice Recognition Software: Programs like Dragon NaturallySpeaking, which allows users to control their computer and input text using voice commands.

iv) Educational Apps: Apps like Avaz, which helps children with speech disabilities communicate, and Balbharti Digital Textbooks, which provide accessible educational materials (Saksham)

Useful Applications for Divyangjan

1. SuperVision
2. Visor
3. Here to Read
4. Tap TapSee
5. GoogleBrailleback
6. Divyang Sarthi
7. Freedom Scientific
8. Ariadne GPS
9. Seeing AI
10. KaviType
11. Sugamya Pustakalaya.
12. Prashikshan
13. ISL Journey

1.4 Selection of Assistive Devices

Appropriate Technology

Many types of technology are not suitable for rural/remote areas and low-income countries. However, “appropriate technology” is designed with consideration given to the environmental, cultural, social and economic factors that influence communities and individuals. Appropriate technology meets people's needs; it uses local skills, tools and materials and is simple, effective, affordable and acceptable to its users. Assistive devices are technologies that must be carefully designed, produced and selected to ensure they meet these criteria.

Assessment of Assistive Devices

Assistive devices need to be carefully selected and often specially made and fitted to ensure they meet the individual's needs. Poor selection and design can lead to many problems including frustration, discomfort and the development of secondary conditions. For example, it may be common practice in some countries to distribute donated or second-hand wheelchairs on a large scale. While this may have benefits, it also has the potential to cause harm to users, e.g. the provision of a wheelchair without a cushion to a person with a spinal cord injury may cause a potentially life-threatening pressure area.

Comprehensive assessment is necessary to ensure assistive devices meet the needs of individuals within their homes, schools and work and community environments. A comprehensive assessment might include a medical history, a review of current function, individual goals, an evaluation of existing assistive devices and a physical examination. The approach to assessment should be multidisciplinary where possible and include a wide variety of people, such as people with disabilities, family members, therapists, technicians, teachers and CBR personnel.

1.5 Use of assistive devices

Many people use their assistive devices in different places and it is important to ensure that all environments are barrier-free in order for someone to achieve maximum function and independence. For example, a young woman using a wheelchair must be able to use it to enter/exit her home, move freely within her home and access important areas (e.g. the bathroom), travel within her community and access her workplace.

Adaptations/modifications to the physical environment include installing a ramp where there are steps, widening a narrow doorway, reorganising furniture to increase the amount of space for movement. It is also important to consider other aspects of the environment, e.g. attitudes and support systems, which can also influence a person's ability to use the device. For example, a young boy who uses a communication board instead of speech will need to use his board

both at home and at school, so it is important that family members, schoolteachers and friends are positive, willing and able to use this device with him.

When considering environmental modifications, particularly within the community, it is helpful to consider “universal design” . Universal design means designing products, environments, programmes and services to be usable by all people, both with and without disabilities.

Recent research indicates that assistive technology has had a positive impact on students’ learning Sivin-Kachala & Bialo, 1993). Studies also reveal that it is how teachers adapt and utilise the technology that makes a difference and not the technology itself. The effect of assistive devices on students with disabilities were positive; reaching that potential requires knowledge on the part of the user (Merbler, Hadadian, & Ulman, 1999).

There are four considerations when matching students with disabilities to assistive devices. The first consideration is to assess the student and know his/her capabilities and limitations. The second consideration is to know what is available in assistive technology. The challenge is to match the two for a successful learning experience. The third consideration is the ease of use of a device, the learning curve for the user or bystanders, and the noise level of the device. The fourth consideration is to match the assistive devices tool to age, gender, preferences of the user to promote acceptance, and use (King, 1999).

There are several trends and issues that arise when selecting, acquiring, and using assistive technology. There continues to be a general lack of information among professionals, administrators, and parents on the availability and use of devices to promote access to the general curriculum.

Several studies have highlighted the importance of teachers' awareness and competence in using assistive devices for effective inclusive education. Alkahtani (2016) found that teachers' positive attitudes and knowledge about assistive technologies were key factors in their willingness to incorporate these tools in their classrooms. Similarly, Hasselbring and Glaser (2000) emphasised the need for professional development programs to equip teachers with the necessary skills to integrate assistive devices into their teaching practices effectively.

In India, research on teachers' awareness and preparedness to use assistive devices in inclusive settings is limited (Sharma & Deppeler, 2005). A study by Rana et al. (2018) revealed that many teachers in India lack adequate knowledge and training in using assistive technologies, which can hinder the successful implementation of inclusive education policies. This gap in knowledge and training highlights the need for further research to understand the current level of awareness and preparedness among teachers in India, particularly in regions like Bhopal, where inclusive education initiatives are being implemented.

The proposed research aims to investigate teachers' awareness about assistive devices used in inclusive settings, focusing on four government and private schools in Bhopal, Madhya Pradesh. By exploring teachers' knowledge, attitudes, and perceived barriers to using assistive devices, this study will contribute to a better understanding of the challenges and opportunities related to implementing inclusive education practices in the Indian context.

The city of Bhopal, the capital of Madhya Pradesh, has made efforts to promote inclusive education in recent years. The state government has implemented various policies and programs to ensure equal educational opportunities for students with disabilities (Department of Empowerment of Persons with Disabilities, Government of Madhya Pradesh, 2021). However, the successful implementation of these initiatives hinges on the preparedness and competence of teachers in meeting the diverse needs of students with disabilities.

Teachers play a pivotal role in creating an inclusive learning environment and facilitating the effective use of assistive devices (Alkahtani, 2016; Hasselbring & Glaser, 2000). Their knowledge, attitudes, and skills in utilising these tools can significantly impact the learning experiences and academic achievements of students with disabilities (Alnahdi, 2014). However, previous studies have highlighted that many teachers lack adequate training and professional development opportunities in the area of assistive technologies (Rana et al., 2018; Sharma & Deppeler, 2005; Srivastava et al., 2015).

The proposed research aims to bridge this gap by investigating teachers' awareness and preparedness to use assistive devices in inclusive settings within the context of Bhopal. By focusing on government and private schools, the study provided insights into the current state of teachers' knowledge, attitudes, and perceived barriers related to assistive devices. This information would inform the development of targeted training programs and support mechanisms to enhance teachers' competencies in this crucial area (Alkahtani, 2016; Hashim et al., 2014).

Furthermore, the study would contribute to the broader discourse on inclusive education in India by highlighting the challenges and opportunities associated with the implementation of assistive technologies in schools. The findings can potentially inform policy decisions and resource allocation to support the effective integration of assistive devices in inclusive classrooms (Srivastava et al., 2015; Yadav & Das, 2019).

In summary, this research is timely and relevant as it aligns with India's commitment to promoting inclusive education and ensuring equal learning opportunities for all students, as outlined the RPWD Act, 2016, RTE Act, 2009 and its 2012 amendment the National Education Policy (NEP) 2020, particularly Theme 6 on Equitable and Inclusive Education. By investigating teachers' awareness and preparedness to use assistive devices in Bhopal, this study will provide valuable insights to stakeholders, policymakers, researchers and

educators, ultimately contributing to the advancement of inclusive education practices in the region and beyond (Alnahdi, 2014; Sharma & Deppeler, 2005; Yadav & Das, 2019).

1.6 Statement of the Problem

In the present study, the researcher has undertaken the problem of identifying the awareness and utilisation of assistive devices by teachers in inclusive settings. Despite the growing emphasis on inclusive education, there is limited understanding of how well-equipped teachers are in terms of knowledge and use of assistive technologies to support differently-abled students (Divyang). Therefore, the problem is stated as "A Study of Teachers' Awareness about Assistive Devices used in Inclusive Settings"

1.7 Need and Significance of the Study

The significance of this study lies in its potential to bridge the gap between the theoretical framework of inclusive education and its practical implementation in classrooms. Assistive devices are crucial for enabling students with disabilities to access the curriculum and participate fully in educational activities. However, the effectiveness of these devices largely depends on the teachers' awareness and ability to use them appropriately.

1. **Promoting Equity and Inclusivity:** By assessing teachers' awareness of assistive devices, this study aims to enhance the inclusivity of educational

environments, ensuring that all students have equal opportunities to learn and succeed.

2. **Improving Teacher Training Programs:** The findings of this study can inform the design of professional development programs, highlighting areas where teachers need more training and support.
3. **Guiding Policy and Practice:** The research can provide valuable insights for policymakers and educational administrators to develop strategies that support the effective integration of assistive technologies in schools.
4. **Contributing to Educational Research:** This study will add to the body of knowledge on inclusive education, offering empirical data on the current state of teacher preparedness in using assistive devices.

1.8 Objectives:

The objective includes the following-

(i) to assess the current level of awareness among teachers regarding assistive devices in inclusive settings,

(ii) to identify the types of assistive devices commonly used in inclusive education, and

(iii) to examine the challenges faced by teachers in integrating assistive devices into inclusive classrooms.

1.9 Delimitations

1. **Geographic Scope:** The study was limited to schools in Bhopal, encompassing Private and Government, and Rural and Urban institutions.
2. **Participant Criteria:** Only teachers working in inclusive settings within the selected schools were included in the study.
3. **Temporal Scope:** The data collection was conducted for over a 10-day period.
4. **Focus:** The study would specifically focus on the awareness and usage of assistive devices, and not other aspects of inclusive education.