



## **THE ROLE OF DIGITAL ASSISTIVE TECHNOLOGIES IN PROMOTING INCLUSIVE AND ACCESSIBLE EDUCATION FOR STUDENTS WITH DISABILITIES: A QUALITATIVE THEMATIC STUDY OF TEACHERS' PERSPECTIVES**

**<sup>1</sup>Dr. Sahifa Moosa Muradbi Mazgaonkar and <sup>2</sup>Dr. Shital Mandhare**

<sup>1</sup>M. L. Dahanukar College of Commerce (Autonomous), Dixit Road, Vile Parle East, Mumbai

<sup>2</sup>Assistant Professor, Vivekanand Education Society's College of Arts, Science and Commerce (Autonomous), Mumbai

### **Abstract**

The current study aims to explore the role that digital assistive technologies (DATs) play in developing an inclusive and accessible educational system for students with disabilities, from the perspective of the teachers who incorporate these technologies in their daily teaching practices. Even with the advancement in development of assistive technologies and tools, very little has been documented regarding the experiences of teachers regarding the use and evaluation of such technologies. The current study employed an exploratory qualitative design where semi-structured interviews were conducted among ten teachers (N = 10). Analysis of interview transcripts was done through Braun & Clarke's (2006) six-stage process of thematic analysis. The themes that emerged were: Digital Accessibility and Self-learning, Readiness of Teachers, Teacher Attitude towards Inclusive Education & Technology, Institutional & Policy Constraints and Empowerment of Students. These findings point to the fact that the use of DATs enhances independent access to learning resources, but there are disparities and limitations in this regard, and this is a result of insufficient training of teachers, lack of funding, disparity in urban-rural infrastructure and the discrepancy between what the policy seeks to achieve and the implementation process. Technology was always seen as complementary to effective teaching and not a substitute for it. This research provides context-specific and practice-oriented information to the field of inclusive education. Some of the limitations are mentioned with future research directions.

**Keywords:** Inclusive Education, Digital Assistive Technology, Thematic Analysis, Teacher Perspectives, Disability, Accessibility, Qualitative Research

### **1. Introduction**

#### **1.1 Background**

The very essence of inclusion is in the belief that all learners including those who are disabled and non-disabled deserve the chance to learn in an environment that suits them based on their learning styles rather than trying to change them so that they can adapt to a certain teaching method (Government of India, 2016). The idea has been brought out internationally in almost three decades ago under the Salamanca Statement where governments were encouraged to place all children in the regular schooling system "except where compelling reasons exist to justify something different" (UNESCO, 1994). The latest report by UNESCO (2024) highlights that assistive technologies have become the primary approach to achieve this goal for learners with special needs.

For the case of India, this commitment towards global goals has been transformed into an appropriate legal and policy framework. The Rights of Persons with Disabilities (RPWD) Act, 2016 includes 21 categories of disabilities and mandates that there will be training for professionals, formation of resource centers and implementation of initiatives to facilitate inclusive education (Government of India, 2016). The NEP 2020 has further built upon this by adopting inclusive education as an essential component of educational reforms and highlighting the need for integration support services and removing barriers for participation (Sarkar, 2020). Assistive technologies that include screen readers, text-to-speech and speech-to-text software, captioning technologies, adaptive learning technology platforms and more AI based technologies form the core of this implementation.



Cover Page



## 1.2 Problem Statement

Notwithstanding the foregoing, there continue to be significant barriers for students with disabilities who must be included in the traditional mainstream classrooms. Such barriers do not just relate to physical accessibility, but also include lack of accessible learning materials, lack of flexibility in assessments, teacher unpreparedness, and socio-economic factors that determine whether a child has access to the necessary technology and a stable internet connection. It is the teachers who act as main agents for implementing such policies and technologies, however, it is often the case that teachers feel inadequately trained both in inclusion techniques and in the use of new technologies (Marras & Pasqualotto, 2026). Therefore, it becomes imperative to understand how teachers interact with digital assistive technologies for students with disabilities.

## 1.3 Research Gap

There is already an extensive literature that has looked at assistive technology from the viewpoint of students with disabilities in higher education (Papadopoulos et al., 2024), as well as literature which has considered the technical abilities of AI-assisted systems (Zdravkova et al., 2022; Yenduri et al., 2023). Relatively little qualitative, practice-based literature is available that considers the practical experiences of school-level teachers in relation to the use of digital assistive technology with students with disabilities. When this sort of evidence exists, it is found in environments that have more resources and within an educational context. There has been limited empirical evidence found in regard to the practical experiences of teachers in the Indian schooling context and the relationship between teacher readiness and policy implementation as an enabler or inhibitor to inclusive practice.

## 1.4 Research Objectives

Since this study is both exploratory and qualitative in nature, it is not driven by hypotheses but by research objectives. They are as follows:

1. To investigate teachers' experience of teaching students with disabilities in inclusive classrooms.
2. To identify digital assistive technologies used by teachers and their perception of the impact of those technologies on accessibility.
3. To investigate the perceptions of teachers regarding the changes in students' learning, self-confidence, and empowerment through the use of digital assistive technologies.
4. To investigate teacher readiness for inclusion, teacher professional development needs, and institutional support for inclusive digital practices.
5. To identify the barriers to the effective use of digital assistive technologies — institutional, financial, and policy-related.

## 1.5 Significance of the Study

In doing so, this study adds to an academic space that is more often talked about in terms of policy or technology than in terms of the practitioner judgments through which these policies or technologies get enacted in the first place. In terms of policy, this study adds insight into what kinds of areas the policy/practice gap is largest from a practice standpoint. In terms of institutional training and implementation, this study provides insights on how such a project would look, articulated by teachers. In terms of tool design, the study provides insights on the actual constraints behind adoption of tools in resource-strapped classrooms. And for other researchers, the study provides a replicable thematic analysis method.



Cover Page



## 2. Literature Review

### 2.1 Inclusive Education: Global and Indian Context

International concepts regarding inclusive education were established by the Salamanca Statement and Framework for Action adopted by 92 governments in 1994, in which the framework for special needs education reform was proposed that “All learners should have access to some kind of schooling and all children should learn together, so far as is feasible, and ordinary schools should accommodate diversity among learners and not vice versa” (UNESCO, 1994). This perspective on inclusion as a transformative process rather than an accommodation added to the existing system has remained at the core of policy discourse worldwide, and according to UNESCO's thirtieth-anniversary assessment of the Statement, assistive technologies have emerged as one of the key ways by which this transformation is being realized despite the fact that a large number of countries, especially those in Asia, continue to allow segregating children with special needs through their legislation (UNESCO, 2024).

India's domestic structure follows the same path as its international one, though with teeth. According to the Rights of Persons with Disabilities Act, 2016, inclusive education can be described as an education system where both the disabled and non-disabled students learn together with the adaptation of learning processes and methods for each individual case, with the provision for training specialists and creating resource centres to facilitate the process (Government of India, 2016). Later, the National Education Policy 2020 reasserted these principles by focusing on integrating services and removing barriers so that all children have access to cooperative education (Sarkar, 2020). All these form a strong legislative base for promoting inclusion, but the question this research addresses is what is happening on the ground in terms of teachers' practices.

### 2.2 Digital Assistive Technologies: Concept and Types

DAT is any digital tool, software, or device that helps the learner with a disability gain access to and manipulate learning that would otherwise be beyond their reach by virtue of standard teaching aids. In the existing literature on the subject, one can see differentiation between specialized assistive technology (screen readers, Braille output systems, augmentative communication devices), which is designed specifically for helping individuals with disabilities, and mainstream technology (smartphones, tablets, word processors, video conferencing tools) adapted for assisting people with impairments, especially the latter is usually readily available and cheaper (Papadopoulos et al., 2024).

The most common types of aids include screen readers and text-to-speech technology used by visually impaired students; captioning, live captioning, and speech-to-text applications used by hearing-impaired learners; adaptive and multiple format platforms (audio, video, simple text) used by students with specific learning difficulties, such as dyslexia; and artificial intelligence systems that are capable of simplifying text, creating personalized exercises, and translating texts in real-time (Zdravkova et al., 2022). Reviewing the AI-based assistive applications designed for children with disabilities highlights the importance of personalizing learning as well as the fact that there is a lack of ethical issues associated with the implementation of such technologies, which is understudied (Zdravkova et al., 2022). At the same time, reviewing technologies that can be used by students with particular learning disabilities in higher education institutions shows that the success of the application of such technology is strongly associated with pedagogical implementation (Yenduri et al., 2023).

### 2.3 Challenges: Policy Gaps, Teacher Preparedness, and Socio-Economic Barriers

One common topic throughout all readings is the difference between policy intentions and actual implementation on a classroom level. It is possible to note that despite some national or institutional policies being positive about inclusive education and assistive technologies, adoption of these policies can be uneven and depends on many factors, including funds available, different infrastructure in rural and urban settings, and institutional discretion (Sarkar, 2020). The readiness of



teachers is seen as one of the critical barriers: teachers state that their training related to assistive technologies and inclusive education is sporadic and often occurs once during the workshop (Marras & Pasqualotto, 2026).

These socio-economic limitations only add to the issues discussed above. In those instances when there are expensive licenses for technology and there is no possibility for children to afford the technology and/or be connected to the Internet at home, classroom use of the technology does not benefit equally when it comes to the use of technology by children independently from school. This issue – that of an additional divide on top of the existing one caused by disabilities – is a consistent topic of discussion in the literature on technology-based inclusion of people with special needs.

## 2.4 Thematic and Qualitative Studies: Prior Findings

Past qualitative studies form a good basis for comparison in the current investigation. Papadopoulos et al. (2024) carried out semi-structured interviews of 42 higher education students with various disabilities including those of visual, auditory, locomotion, and learning nature from four European countries with the aim of identifying through content analysis the technologies known to and used by the respondents; their findings revealed that there was a constant gap between knowledge about technologies available and their actual use. From the point of view of the teacher, Marras and Pasqualotto (2026), applying reflexive thematic analysis on the focus group interviews conducted among 46 elementary and middle school teachers, investigated how teachers manage their professional agency in adopting AI-assisted systems in neurodivergent inclusive classrooms and concluded that the adoption of these technologies is dependent not so much on the technical capabilities of the technology as on the professional judgement of the teacher himself/herself.

There seems to be an indication of the importance of the role of teachers' power and institutional trust along with that of technology itself in its effective adoption within an inclusive setting. This paper further explores the research area in question and tries to develop a ground-up understanding of how digital assistive technologies work and fail to do so in their everyday use within the inclusive education system in India. The analysis used in this regard is the six-phased thematic analysis developed by Braun & Clarke (2006).

## 3. Methodology

### 3.1 Research Design

This study adopted a qualitative, exploratory research design using open-ended, semi-structured interviews. The selection of a qualitative research design was appropriate for this study in light of the nature of the research questions being investigated, which focus on teachers' perceptions and experiences of using digital assistive technologies in their classes, since meaning-making, judgements and practices cannot be effectively measured through pre-defined quantitative measures. Like any exploratory qualitative design, the current study is hypothesis free and research objectives driven.

### 3.2 Sample and Selection Criteria

The participant sample in this research was drawn from a total of ten (N=10) in-service teachers who had firsthand experience working with disabled learners in the classroom. The selection of these participants was purposely made in order to create maximum variation on factors such as gender, years of experience (ranging between 7 years to 28 years), institution type (government, government aided, private, autonomous and CBSE), and geographical location (both urban and rural). In all these participants, experience of working with learners with problems in vision, hearing, autism, dyslexia, ADHD and locomotor disability was mentioned.



**Table 1. Demographic Profile of Participating Teachers (N = 10)**

| Code | Gender | Age | Teaching Experience |
|------|--------|-----|---------------------|
| T-01 | F      | 42  | 16 yrs              |
| T-02 | M      | 36  | 11 yrs              |
| T-03 | F      | 49  | 24 yrs              |
| T-04 | F      | 33  | 9 yrs               |
| T-05 | M      | 54  | 28 yrs              |
| T-06 | F      | 31  | 7 yrs               |
| T-07 | F      | 45  | 19 yrs              |
| T-08 | F      | 39  | 15 yrs              |
| T-09 | M      | 42  | 16 yrs              |
| T-10 | M      | 50  | 25 yrs              |

*Source: Researcher's Compilation*

The use of a participant pool of ten is in line with conventional wisdom in thematic analysis in a bounded and exploratory qualitative study where the aim of the analysis is to achieve depth and pattern recognition rather than generalization (Braun & Clarke, 2006). It is worth emphasizing clearly that the initial research design planned for a larger number of interviews; the current analysis has been carried out based on the ten interviews analyzed up to date and this is explained as a limitation in Section 6.3.

### 3.3 Data Collection

Data were gathered through face-to-face, semi-structured, open-ended interviews that took from thirty to forty-six minutes. Interviews were carried out following a structured interview guide based on six a priori themes, which include Accessibility and Inclusive Learning; Student Learning and Empowerment; Teacher Readiness and Professional Development; Institutional Support and Infrastructure; Challenges and Barriers; and Future Directions and Policy Recommendations. This guide contained sixteen questions and related probes (included in full in Appendix A). The open-ended interview technique enabled interviewees to describe their own experiences without having to choose among a set of pre-set response options since this is an exploratory study. Before each interview, the purpose of the study was orally explained to the participants and their informed consent was sought to tape-record the discussion, while each interviewee was allocated a code (T-01 to T-10).

### 3.4 Data Analysis

The interviews were analysed using Braun & Clarke's (2006) six stage thematic analysis process due to its transparency, adaptability and popularity in qualitative educational and health studies. Table 2 below is a summary of the way the six stages were used in this study.

**Table 2. Application of Braun and Clarke's (2006) Six-Phase Thematic Analysis**

| Phase                       | Application in this Study                                                                                                                                   |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Familiarisation          | Repeated reading of all ten transcripts alongside the audio-recording notes; initial observations logged for each participant.                              |
| 2. Generating initial codes | Line-by-line open coding of the data set (e.g., "independent access", "self-directed learning", "funding gap", "urban-rural disparity", "confidence gain"). |



|                               |                                                                                                                                             |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 3. Searching for themes       | Related codes were clustered into candidate themes and sub-themes using a code-to-theme matrix.                                             |
| 4. Reviewing themes           | Candidate themes were checked against individual coded extracts (Level 1) and the full data set (Level 2); overlapping themes were merged.  |
| 5. Defining and naming themes | Each theme was refined into a clear definition, a working name and a description of its scope and boundaries (Table 2).                     |
| 6. Producing the report       | Themes were written up with illustrative, verbatim extracts from participants, contextualised against the literature reviewed in Chapter 2. |

*Source: Researcher's Compilation*

The process of coding incorporated both an inductive coding approach, which involved deriving codes based on participants' language, and a slight deductive coding approach that was determined by the six themes incorporated in the interview protocol. This is a practice in line with what should be done in educational research, where a structure for the interview can provide guidance for coding without inhibiting the identification of unexpected patterns.

### 3.5 Ethical Considerations

The study adhered to established procedures of conducting ethical qualitative educational research. Every subject was provided with verbal description of the aim of the study prior to the interview and gave their explicit consent to participate and to have their conversation recorded. All subjects were told that participation in the study was voluntary, their answers would be kept confidential and would only be used for the academic purposes. Alphanumeric codes (T-01-T-10) were utilized throughout all stages of data collection and analysis instead of the names or other personal information. Taking into account the sensitive nature of the topic, neutral and non-judgmental formulation of the questions and probes was made to avoid any deficit framing of students and teachers.

### 3.6 Sample Size and Scope: A Note of Transparency

The following is an analysis of the ten interviews transcripts (T-01-T-10) provided for coding. Any researcher who would want to use this study in writing a bigger thesis or a published research paper should see this analysis as just the first analysis of the dataset and should try to increase the number of interviews analyzed – instead of considering N=10 as the final one – in case there are more interviews that become available for analysis.

## 4. Results: Thematic Analysis

Five themes emerged as a result of the analysis of the ten transcripts. Table 3 below summarizes the themes together with their working definitions and frequency within the sample population. The themes will be further discussed in relation to examples extracted from the transcripts of the participants.

**Table 3. Overview of Themes, Definitions, and Frequency (N = 10)**

| Theme                                        | Definition                                                                                                                                                                                | Frequency (n/10) | Prevalence |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------|
| Digital Accessibility & Independent Learning | Ways in which assistive tools (screen readers, text-to-speech, captioning, adaptive platforms) reduced dependence on others and widened access to materials, participation and assessment | 10               | Very high  |



|                                                 |                                                                                                                                               |    |           |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----|-----------|
| Teacher Preparedness & Professional Development | Teachers' own readiness, training history, and self-directed learning in using digital assistive technologies                                 | 10 | Very high |
| Teacher Attitudes Toward Inclusion & Technology | Beliefs about equity vs. equality, the role of technology as a complement (not substitute) for good teaching, and caution about over-reliance | 09 | High      |
| Institutional & Policy Barriers                 | Gaps between policy intent and ground-level implementation — funding, monitoring, urban–rural disparity, digital divide                       | 10 | Very high |
| Student Empowerment & Confidence                | Observed gains in learner confidence, independence, participation and willingness to engage after AT use                                      | 09 | High      |

*Source: Researcher's Compilation*

#### 4.1 Theme 1: Digital Accessibility and Independent Learning

The theme highlights the changes brought about by digital assistive technology regarding the capacity of disabled students to perform independently and without having to rely on a teacher or fellow students in order to gain access to the learning process. All participants (10/10) provided an account of such a shift, mostly using the issue of independence as the basis for discussion. Disabled students were able to “access learning materials independently, without solely relying on teachers or fellow students” (T-01).

*“Accessibility is no longer limited to physical access. It now includes digital accessibility, communication accessibility and assessment accessibility.” — T-03*

*“Technology has significantly improved accessibility because students can now learn in ways that suit them best. Instead of expecting everyone to read printed textbooks, students can listen to audio lessons, watch instructional videos or use interactive applications.” — T-04*

This enhanced accessibility was clearly associated with modifications in the ways participants conducted their classroom participation and assessment activities – some of them mentioned that through the use of digital technologies they could allow students to have oral presentations, multimedia tasks, or digitally-timed tests as an alternative to a conventional written assessment. On the other hand, some participants (e.g., T-02, T-03, T-04) did not forget to point out that technology should be a tool for good teaching but not a replacement for it.

#### 4.2 Theme 2: Teacher Preparedness and Professional Development

Each participant (10 out of 10) spoke of his or her training experience, and an interesting sub-theme was evident from most of the teachers' responses – they felt that they had been inadequately trained for the use of assistive technologies at their institutions and that they have learnt to use such technologies informally.

*“Honestly, I did not feel adequately prepared. My teacher education programme included very little training on inclusive education or assistive technologies. Most of what I know today has been learned through experience, online tutorials, and collaboration with colleagues.” — T-01*

*“I believe regular hands-on training is essential. Teachers need practical experience rather than only theoretical sessions... Training should be continuous because technology evolves rapidly.” — T-01*



This trend was witnessed in the majority of cases with some slight variations: the training that took place in these cases was seen to be occasional and conducted in workshops instead of on a continual basis, thereby making teachers responsible for their own learning in order to fill this void. The need for continual professional development, which should be practical instead of only theoretical, was mentioned by some of the participants, in line with the research findings that emphasize the importance of teacher empowerment and confidence over technological availability. (Marras & Pasqualotto, 2026).

### 4.3 Theme 3: Teacher Attitudes Toward Inclusion and Technology

This theme (9/10) is an indication of the philosophical stance that teachers took regarding inclusion and the proper place of technology within the process. This is exemplified by the fact that the issue of equality vs equity was repeatedly made in discussions.

*“Earlier, I believed that treating every student the same was the fairest approach. However, after working with students who have learning disabilities, hearing impairments, and autism spectrum disorder, I realised that equality and equity are different.” — T-02*

*“I am also concerned about excessive dependence on technology... [we should be] ensuring that technology remains student-centred. We should avoid introducing digital tools simply because they are new or popular.” — T-06 / T-08*

The second, also closely related, sub-theme was concern with over-reliance, with several participants (T-06, T-08, T-10) specifically warning against the use of technology for its own sake and stressing that digital technology should be chosen on an individual basis according to students' needs, and not because it is cool. It was a carefully considered, pragmatic skepticism – the appreciation of all the good that can be achieved through using assistive technology together with a firm belief that the latter always has to come second to teaching methods and personal interaction.

### 4.4 Theme 4: Institutional and Policy Barriers

All 10 interviewees (10/10) agreed that there was an appreciable discrepancy between the objectives of inclusive education policy and their implementation. Some of the barriers mentioned included financial limitations, infrastructure disparity between urban and rural regions, and lack of monitoring systems.

*“Although educational policies strongly support inclusive education, implementation often depends on available funding rather than policy intentions. There is also considerable variation between urban and rural schools.” — T-05*

*“Policies increasingly recognise the importance of inclusive education, but implementation remains inconsistent... I also believe national standards for digital accessibility should be strengthened so that every educational institution follows consistent guidelines. Regular monitoring would help ensure that accessibility remains a [continuing priority].” — T-08*

A sub-theme that is closely related to this aspect included the actual digital divide in the form of differentiation of the use of digital resources and technologies by students at schools as opposed to their home situations, which were different depending on their social and geographical backgrounds (T-05, T-06, T-07). The above statement is reflective of the socio-economic barriers highlighted in the existing literature on inclusive education in India (Sarkar, 2020), and highlights that digital assistance cannot replace infrastructural equity.



## 4.5 Theme 5: Student Empowerment and Confidence

Nineteen out of twenty individuals (9/10) observed a recurring trend where students exhibited increased self-confidence, independence, and participation due to the use of technology as an assistive tool, often depicted in an exemplary student case study.

*"I taught a student with severe visual impairment who initially struggled to read printed textbooks. After introducing a screen reader and audio learning materials, the student became much more independent... the student began participating in classroom discussions and even volunteered to present a project using assistive technology." — T-01*

*"I remember a student with ADHD who found it extremely difficult to concentrate during long classroom lectures... Gradually, the student's attention span improved because learning became more engaging. The student also began completing assignments more consistently and started participating." — T-04*

The teachers always defined this empowerment not only as a result of academics but also as a change in perception of the students about their roles in the classroom from that of receivers to participators in the class. In the closing remarks of the participant regarding the main finding of the study, she stated:

*"Digital assistive technologies are powerful tools, but their true value lies in how thoughtfully they are integrated into teaching and learning. When implemented effectively, they help students with disabilities become independent, confident, and active participants in education rather than passive recipients of support." — T-01*

## 5. Discussion

### 5.1 Digital Assistive Technology as a Vehicle for Accessibility and Empowerment

This research, therefore, adds to a growing body of evidence, based on the international higher education experience, demonstrating the importance of digital assistive technology in facilitating access and involvement (Papadopoulos et al., 2024). Rather than just reporting increased access to learning materials, the teachers from the sample have gone a step further in consistently connecting the accessibility factor to tangible student confidence and classroom participation (Theme 5). This, indeed, reinforces the reasoning behind the Indian policy of inclusive education, according to which adjusting the education system to the needs of learners, not vice versa, ensures access and, more importantly, participation (Government of India, 2016; UNESCO, 1994).

### 5.2 Teacher Agency, Not Just Tool Availability, Determines Impact

One important conclusion emerging from both Themes 2 and 3 is that the use of digital assistive technology was not seen as an automatically self-fulfilling process by the teachers. The teachers were always viewed as the determining factor in terms of whether a particular piece of technology was useful for a particular child and ensuring that the technology was used with a purpose and not just for its own sake. It corresponds to the findings of Marras and Pasqualotto (2026), who found that teachers' use of AI-based assistive tools does not depend on the technological complexity of a tool but rather on the teachers' professional judgment and feeling of control over the tool's application. Taken together, this body of evidence implies that an attempt to promote inclusiveness by purchasing more advanced technologies without corresponding efforts to develop teachers' professional competencies (Theme 2) will likely fail to produce desired effects.



Cover Page



### 5.3 The Persistent Gap Between Policy and Practice

All interviewees in this study agreed that there was a similar pattern in terms of structural issues; that although there is policy at both national and institutional levels that promotes inclusion, the implementation of such policies on the ground remains erratic and poorly funded and monitored (Theme 4). These results mirror the previous literature on the National Education Policy 2020, which has been acknowledged as an achievement, despite the need for “greater budgetary allocations, system-based approach with coordination amongst government departments...and sustainable transitions” for the policy to be fulfilled (Sarkar, 2020). The inequalities highlighted through the responses of the participants in the current research bring an added level of granularity to that observation by showing how even under the same policy framework, there can be completely different realities based on the institutions’ locations and resource levels.

### 5.4 How This Study Fills the Identified Research Gap

Where previous research into the qualitative perspective has focused on either the student perspective within higher education (Papadopoulos et al., 2024) or technical reviews of assistive technologies made possible by artificial intelligence (AI) (Zdravkova et al., 2022; Yenduri et al., 2023), the present work adds value through the teacher-oriented, school-focused account informed by the Indian context of policy and institution. Through the use of teachers’ language and judgements, which the technology-centered literature is unable to address, the thematic analysis identifies concrete points of friction between informal and formal training, urban-rural infrastructure disparities, and caution regarding dependency.

### 5.5 Barriers and Opportunities

However, while these obstacles - cost, lack of regular training, inequality in infrastructure, and lack of policy monitoring - are serious, on the basis of this data, they do not appear to be viewed by the teachers involved in the research as obstacles to be gloomy about. Each and every obstacle that emerged from the analysis was matched with a corresponding suggestion, which can be formulated in the following way: regular training, budgetary financing specifically earmarked for assistive technologies, outcome monitoring rather than mere resource availability monitoring, and cooperation between technology developers and teachers/assistive technology users. Such findings demonstrate that there is an opportunity structure well known to practitioners that is available to the policy-makers who will take their cue from the practitioners rather than statistics of access alone.

## 6. Conclusion

### 6.1 Summary of Key Insights

The research carried out interviews with ten teachers in order to examine how digital assistive technologies contribute to inclusion and accessibility in schools and colleges in India in relation to disabled learners. The themes arising from thematic analysis included: digital assistive technologies increase independent access to learning resources and test formats (Theme 1); teachers generally self-teach themselves how to use these technologies, as there is no formal training available (Theme 2); teachers regard these technologies as complimentary to teaching rather than replacements thereof (Theme 3); institutional and policy support for inclusion is irregular and dependent on budgeting and urban-rural differences (Theme 4); and the use of such technologies is linked to real-life benefits to the learner, including self-confidence and increased participation (Theme 5).



## 6.2 Practical Recommendations

For institutions: implement continual hands-on (and not one-time workshop-oriented) professional development for assistive technology utilization; allocate budget lines that are not project-specific for assistive technology maintenance and upgrade; and take into consideration shared resource centers where small institutions could share access to specialized software and staff.

To policy makers: develop strong national standards for digital accessibility with measurable implementation criteria and not only guidelines; channel funds specifically to rural or underprivileged government-run schools to address the rural-urban divide found in the research; and include training for inclusive education and assistive technologies in compulsory teacher education curriculum.

To technology providers: build assistive technologies in partnership with teachers and students with disabilities; consider cost-effectiveness and compatibility with limited bandwidth connectivity; and offer continuous technical assistance.

## 6.3 Limitations

There are weaknesses inherent in this study that should guide its interpretation and implementation. Firstly, this research is based on the results of ten interviews with teachers; although the sample size is appropriate for an exploratory thematic analysis, it cannot claim statistical validity, and a greater sample would be expected to reveal other, disability- or sector-specific themes. Secondly, the views of those with disabilities, or even their parents or caregivers, have not been taken into consideration in this research, and their perspective on the use of technology is likely to be very different from that of the teachers who described it. Thirdly, all of the study participants came from a single policy environment (India), and the barriers they report can be specific to it. Finally, any study that uses interviews suffers from the weakness that the participants' answers are merely a reflection of their self-perception.

## 6.4 Suggestions for Future Research

The future direction for this study should include further examination with a broader sample of educators from different geographic locations and institutions to determine whether the five themes discovered here will apply in a more widespread context. Using a mixed-method approach combining interviews with the measurement of student success through attendance and assessment can reveal whether or not the effects of increased confidence and empowerment found in this qualitative study will hold true using a more concrete measure. The future direction for this project should also include gathering input from disabled students and parents/guardians of disabled students, as well as studying technology use specifically among disabled students.

## References

1. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
2. Government of India. (2016). The Rights of Persons with Disabilities Act, 2016. Ministry of Law and Justice. [https://www.indiacode.nic.in/bitstream/123456789/15939/1/the\\_rights\\_of\\_persons\\_with\\_disabilities\\_act\\_2016.pdf](https://www.indiacode.nic.in/bitstream/123456789/15939/1/the_rights_of_persons_with_disabilities_act_2016.pdf)
3. Marras, A., & Pasqualotto, A. (2026). Negotiating assistive technologies and AI in inclusive education: Professional agency in neurodivergent contexts. *Frontiers in Child and Adolescent Psychiatry*, 5, Article 1820276. <https://doi.org/10.3389/frcha.2026.1820276>



Cover Page



4. Papadopoulos, K., Koustriava, E., Isaraj, L., Chronopoulou, E., Manganello, F., & Molina-Carmona, R. (2024). Assistive technology for higher education students with disabilities: A qualitative research. *Digital*, 4(2), 501–511. <https://doi.org/10.3390/digital4020025>
5. Sarkar, T. (2020, August 12). Examining disability inclusion in India's new National Education Policy. UKFIET: The Education and Development Forum. <https://www.ukfiet.org/2020/examining-disability-inclusion-in-indias-new-national-education-policy/>
6. UNESCO. (1994). The Salamanca Statement and framework for action on special needs education. United Nations Educational, Scientific and Cultural Organization.
7. UNESCO. (2024, March 18). Q&A: How inclusion in education has evolved. <https://www.unesco.org/en/articles/qa-how-inclusion-education-has-evolved>
8. Yenduri, G., Kaluri, R., Rajput, D. S., Lakshmana, K., Gadekallu, T. R., Mahmud, M., & Brown, D. J. (2023). From assistive technologies to metaverse—Technologies in inclusive higher education for students with specific learning difficulties: A review. *IEEE Access*, 11, 64907–64927. <https://doi.org/10.1109/ACCESS.2023.3289496>
9. Zdravkova, K., Krasniqi, V., Dalipi, F., & Ferati, M. (2022). Cutting-edge communication and learning assistive technologies for disabled children: An artificial intelligence perspective. *Frontiers in Artificial Intelligence*, 5, Article 970430. <https://doi.org/10.3389/frai.2022.970430>



Cover Page



## **Appendix A: Interview Protocol — Exploring Teachers' Perspectives on Digital Assistive Technologies in Inclusive Education**

### **Section A: Participant Profile**

- Gender:
- Age:
- Highest Educational Qualification:
- Years of Teaching Experience:
- Institution Type:
- Current Position:
- Have you taught students with disabilities?
- Approximately how many students with disabilities have you taught?
- What types of disabilities have your students had?
- Have you received any formal training in inclusive education or assistive technologies?

### **Section B: Interview Questions**

#### **Theme 1: Accessibility and Inclusive Learning**

**Q1. How would you describe your experience of teaching students with disabilities in an inclusive classroom?**

*Possible Probes:*

- Different learning needs
- Classroom participation
- Teaching strategies
- Accessibility challenges

**Q2. What digital assistive technologies do you currently use when teaching students with disabilities?**

*Possible Probes:*

- Screen readers



Cover Page



- Speech-to-text software
- Captioning tools
- Educational apps
- AI-based tools
- Learning Management Systems

Q3. In your opinion, how have these technologies influenced accessibility in your classroom?

*Possible Probes:*

- Access to learning materials
- Participation
- Communication
- Assessments

Theme 2: Student Learning and Empowerment

Q4. What changes have you observed in students after they started using digital assistive technologies?

*Possible Probes:*

- Academic performance
- Confidence
- Independence
- Motivation
- Classroom interaction

Q5. Can you share an example where digital assistive technology made a positive difference in a student's learning experience?

Theme 3: Teacher Preparedness and Professional Development

Q6. How prepared did you feel when you first started teaching students with disabilities using digital technologies?

Q7. What kind of training or professional development have you received regarding assistive technologies?



Cover Page



*Possible Probes:*

- Workshops
- Online courses
- Institutional training
- Self-learning

Q8. What additional support or training would help you integrate assistive technologies more effectively?

Theme 4: Institutional Support and Infrastructure

Q9. How does your institution support teachers in implementing inclusive education using digital technologies?

*Possible Probes:*

- Infrastructure
- Software
- Internet
- Technical support
- Administrative support

Q10. What resources do you believe are still lacking in your institution?

Theme 5: Challenges and Barriers

Q11. What are the biggest challenges you face when using digital assistive technologies in teaching?

*Possible Probes:*

- Cost
- Internet connectivity
- Technical issues
- Time
- Student adaptability



Cover Page



Q12. Have you encountered any barriers related to institutional or educational policies?

*Possible Probes:*

- Funding
- Guidelines
- Accessibility standards
- Administrative procedures

Theme 6: Future Directions and Policy Recommendations

Q13. What improvements would you recommend to make digital assistive technologies more effective in inclusive education?

Q14. What role do you think government and educational institutions should play in promoting digital inclusion?

Q15. How do you think emerging technologies such as Artificial Intelligence can support students with disabilities in the future?

Q16. (Closing Question) Is there anything else you would like to share about your experiences or opinions regarding digital assistive technologies and inclusive education?



Cover Page



## Appendix B: Informed Consent Script

Thank you for agreeing to participate in this study. The purpose of this interview is to understand teachers' perspectives on digital assistive technologies in inclusive education. There are no right or wrong answers — we are interested in your experiences and opinions. Your responses will remain confidential and will be used only for academic research; your identity will not be disclosed in the research report, and an alphanumeric code will be used in place of your name throughout data handling and reporting. With your permission, I would like to audio-record this interview for transcription purposes. Participation is voluntary, and you may decline to answer any question or withdraw at any point without any negative consequence.

*Participant confirmation: "Yes, I understand the purpose of the study, and I am happy to participate. You may record the interview."*