RESEARCH ARTICLE

Volume 5, **Issue** 1, January-June, 2026 (pages 59-73)

Journal of Childhood Literacy and Societal Issues

Peer-reviewed, Open-access, HEC-recognized Y-category

Journal DOI: https://doi.org/10.71085/joclsi

P-ISSN: 3006-7863 **E-ISSN:** 3006-7871

Exploring the Lived Experiences of Students with Visual Impairment in utilizing AI-Driven Assistive Technologies in Higher Education: A Qualitative Study

Umme Habiba[1]

[1]Trained Graduate Teacher, Sir Syed School and College of Special Education, Rawalpindi, Pakistan.

Email: ummhabiba98@gmail.com

Doi: https://doi.org/10.71085/joclsi.05.01.92

Article information

Article History:
Received: 2026-04-21
Received in revised form: 2026-05-17
Accepted: 2026-06-06
Published Online: 2026-06-30

Keywords:
Artificial intelligence; Visual impairment; Assistive technology; Higher education accessibility; Inclusive education

ABSTRACT

The present study explores the lived gests of scholars with visual impairment in exercising AI- driven assistive technologies in advanced education. The study adopts a qualitative phenomenological approach to understand how these scholars perceive and use technologies similar as screen compendiums, OCR tools, and voice sidekicks in their academic life. Data were collected through semi-structured interviews and anatomized using thematic analysis. Findings reveal that AI- driven assistive technologies significantly enhance academic availability, independence, and confidence among scholars. still, several challenges were also linked, including specialized limitations, language walls, fiscal constraints, and limited institutional support. The study concludes that while AI technologies have strong implicit to promote inclusive education, their effectiveness depends on availability, training, and contextual adaption.

The Journal is published biannually (June & December) by the Centre for Children Literacy and Lifelong Learning (CCLLL), Pakistan. **Web link:** https://cclll.org

Introduction

Visual impairment is honored as a significant sensitive disability that affects an existent's capability to pierce, process, and interact with visual information in everyday life, particularly within educational surrounds. According to the World Health Organization (WHO, 2023), millions of people worldwide experience varying degrees of visual impairment, numerous of whom face patient challenges in penetrating indifferent educational openings. In advanced education, where learning surroundings are decreasingly dependent on visual and digital coffers, scholars with visual impairment frequently encounter walls that hamper their full academic participation and success (Baker et al., 2020).

The conception of inclusive education emphasizes equal access and participation for all learners anyhow of disability. still, despite policy-position commitments, scholars with visual impairment continue to face academic, social, and technological challenges in advanced education settings (Florian & Black- Hawkins, 2011). These challenges include difficulty in penetrating published accoutrements, limited vacuity of accessible literacy coffers, and shy institutional support systems. As a result, similar scholars frequently calculate heavily on assistive technologies to grease their literacy processes and enhance independence.

Assistive technology has surfaced as a critical tool in bridging the availability gap for scholars with visual impairment. Traditional assistive tools, similar as screen compendiums, Braille displays, and audio- grounded literacy systems, have significantly bettered access to information (Alper & Raharinirina, 2006). These technologies enable scholars to interact with digital content, share in academic conditioning, and manage their educational tasks more effectively. exploration indicates that the use of assistive technology not only improves academic performance but also enhances tone- confidence and autonomy among scholars with disabilities (Edyburn, 2013).

In recent times, the rapid-fire advancement of Artificial Intelligence (AI) has converted the geography of assistive technology. AI- driven assistive technologies, including intelligent screen compendiums, speech recognition systems, object recognition operations, and virtual sidekicks, offer more individualized, adaptive, and effective support for individualities with visual impairment (Holmes et al., 2019). These technologies go beyond traditional tools by enabling real- time commerce, contextual understanding, and enhanced availability of complex digital surroundings. Accordingly, AI has the implicit to review how scholars with visual impairment engage with advanced education.

Despite these advancements, the integration and effectiveness of AI- driven assistive technologies in advanced education remain uneven and underexplored. While being studies have primarily concentrated on the functional benefits and specialized aspects of assistive technologies, there's a conspicuous lack of exploration that captures the lived gests of scholars who use these technologies in real academic settings (Shinohara & Wobbrock, 2016). Understanding these gests is pivotal, as technology relinquishment is told not only by vacuity but also by usability, availability, particular comprehensions, and socio-artistic factors.

likewise, the shift towards digital and online literacy surroundings, particularly in thepost-COVID-19 period, has boosted the reliance on technology in advanced education. Although digital platforms give new openings for availability, they also introduce fresh challenges for scholars with visual impairment, especially when availability features are deficiently enforced (Meleo- Erwin et al., 2021). This evolving environment highlights the need for in- depth qualitative exploration to explore how scholars navigate these technologies and what meanings they attach to their guests.

Given this background, the present study aims to explore the lived gests of scholars with visual impairment in exercising AI- driven assistive

technologies within advanced education. By espousing a qualitative approach, this exploration seeks to give a deeper understanding of the openings, challenges, and counteraccusations associated with the use of similar technologies. The findings of this study are anticipated to contribute to the development of further inclusive educational practices, inform policy- timber, and enhance the design and perpetration of accessible technologies.

Problem Statement

Despite significant advancements in assistive technologies, scholars with visual impairment continue to encounter substantial walls in penetrating indifferent and inclusive advanced education. Traditional assistive tools have bettered availability to some extent; still, the rapid-fire integration of digital literacy surroundings and AI-driven systems has introduced new complications. While AI- driven assistive technologies similar as intelligent screen compendiums, voice sidekicks, and image recognition operations have the eventuality to enhance availability and independence, their factual usability, effectiveness, and impact on scholars' academic and social gests remain rightly understood.

Being literature generally focuses on the specialized effectiveness and functional issues of assistive technologies, frequently neglecting the private, lived gests of scholars who use these tools in real educational surrounds (Shinohara & Wobbrock, 2016). likewise, in developing countries like Pakistan, where technological structure, availability mindfulness, and institutional support systems are still evolving, the challenges may be more pronounced and environment-specific.

In thepost-digital and AI- driven period, it's pivotal to understand how scholars with visual impairment perceive, experience, and navigate AI-grounded assistive technologies within advanced education. Without similar understanding, programs and practices may fail to address the real requirements of these scholars. thus, this study seeks to explore the lived gests of scholars with visual impairment in exercising AI- driven assistive technologies in advanced education, with the end of relating both openings and challenges associated with their use.

Research Objectives

The study aims to

1. To explore the lived gests of scholars with visual impairment in using AI- driven assistive technologies in advanced education.
2. To identify the perceived benefits of AI-grounded assistive technologies in enhancing literacy and academic participation.
3. To examine the challenges faced by scholars with visual impairment in penetrating and using AI- driven technologies.
4. To understand the impact of AI- grounded assistive technologies on scholars' independence, confidence, and academic engagement.
5. To explore the part of institutional support and availability practices in easing the effective use of these technologies.

Research Questions

1. What are the lived gests of scholars with visual impairment in using AI- driven assistive technologies in advanced education?
2. How do scholars perceive the effectiveness of AI- grounded assistive technologies in supporting their literacy?
3. What challenges do scholars with visual impairment hassle while using AI- driven assistive technologies?
4. In what ways do these technologies impact scholars' independence, confidence, and academic participation?
5. How do institutional factors affect the availability and usability of AI- grounded assistive technologies?

Significance of the Study

This study holds significant value for multiple stakeholders in the field of special and inclusive education. originally, it contributes to the being body of knowledge by furnishing an in- depth qualitative understanding of the lived gests of scholars with visual impairment, an area that has been fairly underexplored in current exploration. By fastening on AI- driven assistive technologies, the study addresses a contemporary and fleetly evolving aspect of educational availability.

Secondly, the findings of this exploration can inform preceptors and academic institutions about the practical challenges and requirements of visually disabled scholars, enabling them to design further inclusive tutoring strategies and accessible literacy surroundings. Thirdly, the study can guide policymakers in developing effective programs that promote digital addition and equal educational openings for scholars with disabilities.

Also, this exploration is precious for technology inventors and contrivers, as it highlights stoner-centered perceptivity that can ameliorate the design and functionality of AI- grounded assistive tools. In the environment of Pakistan and analogous developing countries, the study provides environment-specific substantiation that can help bridge the gap between technological advancements and their practical perpetration in educational settings.

Delimitations of the Study

The present study is demarcated to scholars with visual impairment who are enrolled in advanced education institutions, as the primary focus is to explore their academic and technological gests within this specific educational environment. likewise, the study is confined to the use of AI-driven assistive technologies, thereby banning traditional assistive tools unless they're integrated with artificial intelligence features. This delimitation ensures a focused examination of contemporary technological advancements and their applicability in ultramodern educational settings. In addition, the study adopts a qualitative exploration approach, emphasizing the disquisition of lived gests, comprehensions, and meanings rather than counting on quantitative measures or statistical conceptions. Incipiently, the compass of the study is confined to a particular geographical or institutional environment, similar as named universities in Pakistan, in order to give an in- depth and contextually predicated understanding of the miracle under disquisition.

Limitations of the Study

Despite its significance, the present study is subject to certain limitations. Due to the qualitative nature of the exploration, the sample size is anticipated to be fairly small, which may limit the breadth of perspectives captured. Accordingly, the findings of the study may not be generalized to all populations of scholars with visual impairment, particularly those in different artistic or educational surrounds. also, access to actors who laboriously use advanced AI- driven assistive technologies may be limited, especially in regions where similar technologies are n't extensively available or accessible. These limitations, still, do n't undermine the value of the study; rather, they punctuate the need for conservative interpretation of the findings and suggest directions for unborn exploration.

Literature Review

As the visual system is believed to process about 80 percent of all information received daily, vision plays an important role in communication and learning processes (Chia et al., 2004; Buchberger, 2004; Wolbers & Hegarty, 2010). Because of its importance, vision becomes an essential sense for learning, engaging with the outside world, and creating cognitive systems. That is why various developmental disorders like cognitive, socioemotional, and motor coordination challenges result from vision deficiencies (Sonksen, 1997). Moreover, apart from reducing individual competencies, these challenges considerably reduce people’s quality of life. Vision disabilities become especially relevant in learning environments where vision is a necessary

source of input, and that makes it necessary to come up with solutions to create equal conditions.

Global Prevalence of Visual Impairment and Educational Implications

Visual impairment is a significant issue in the field of education. The WHO estimates that 2.2 billion people worldwide—including around 24.5 million school-age children—have some kind of visual impairment. The prevalence of chronic illnesses and population expansion will inevitably lead to an increase in the number. The education industry is severely impacted by visual impairments, especially in developing nations with little resources. By access to education is regarded as a significant right and it is important for both socioeconomic growth and lifetime learning (Manjari, 2020). However, structural obstacles make it impossible for students with visual impairments to receive an education.

Barriers to Education for Visually Impaired Students

While globally there has been a commitment to inclusive education/educational services for visually impaired children throughout the world, there are still numerous barriers confronting them in receiving an education. Some of those barriers include: insufficient qualified educators; a shortage of available educational materials; and insufficient institutional supports (WHO, 2020). Most visual materials, such as charts, diagrams, and/or pictures, continue to be inaccessible to many students. This is particularly problematic for students who require visual data to access a disciplinary field (Armstrong & Murray, 2007). In addition to problems regarding being able to successfully complete their academic program, students experience difficulties with respect to gaining access (finding their way to, etc.) to their classrooms and to their campuses as a result of physical accessibility barriers within education facilities. Studies have shown that the barriers students face in completing their academic programs can significantly hinder their ability to participate in both social and academic activities (Lourens & Swartz, 2016). As a result, many students with visual impairments experience social marginalization and low academic performance.

Need for School-Based and Individualized Interventions

It's critical that there's a variety of comprehensive academy- grounded treatments available to help the visually bloodied pupil. Communication chops, social-emotional development, cognitive capacities, motor chops, and exposure/ mobility are areas of attention for this type of remedy (Stearns, 2017). In order to meet the individual requirements of scholars who are visually disabled, personalized tutoring strategies are necessary because they come from such a wide variety of demographic backgrounds (Wiley et al., 2016). Using personalized tutoring strategies helps to develop the pupil's independence and tone-regard, as well as perfecting their academic issues. Beforehand intervention is especially important because it can have a significant effect on the visually bloodied pupil’s long- term social and academic success.

Assistive Technology in Education

Assistive technology has come a foundation in supporting the education of visually disabled scholars. It encompasses a wide range of tools and bias designed to enhance functional capabilities and grease access to information (Cook et al., 2007; Yuan & Folmer, 2008). exemplifications include screen compendiums, braille displays, exaggeration software, and audio- grounded literacy tools. These technologies enable scholars to pierce digital content, complete academic tasks, and share in classroom conditioning more singly. also, assistive technology has been shown to appreciatively impact not only academic performance but also social-emotional well- being by reducing dependence on others and adding tone- efficacy (Luk, 2005).

Artificial Intelligence as an Arising Assistive Technology

Artificial Intelligence (AI) represents a vital role in assistive technology, offering new possibilities for

enhancing availability and literacy. AI systems are able of literacy, logic, and interpreting complex data, enabling them to perform tasks that traditionally bear mortal intelligence (Patterson, 1990; Russell & Norvig, 2003). These capabilities make AI particularly precious for visually bloodied individualities, as it can reuse visual information and convert it into accessible formats similar as audio or textbook. AI technologies have the eventuality to transfigure education by enabling substantiated literacy gests, perfecting availability, and fostering lesser independence among scholars with visual impairments (Grue et al., 2009).

AI-Grounded Assistive Devices and Applications

Recent advancements in AI've led to the development of innovative assistive bias and operations for visually bloodied individualities. For illustration, smart spectacles equipped with computer vision technology can descry and fete textbook from images and convert it into speech, allowing druggies to "read" visual content (AlSaid et al., 2019). These systems use advanced tools similar as Optical Character Recognition (OCR), OpenCV, and deep literacy algorithms to reuse visual data. also, mobile operations like Visual confidante use artificial neural networks to identify objects and give audile feedback (Bagwan & Sankpal, 2015). These technologies significantly enhance the capability of visually disabled scholars to interact with their terrain and access educational accoutrements.

Sensitive Substitution Technologies

Sensitive negotiation bias offers indispensable styles for perceiving visual information by converting it into audile or tactile signals. Beforehand exploration in this area demonstrated the feasibility of representing images through sound, enabling druggies to interpret spatial information (Meijer, 1992). posterior studies have shown that individualities can learn to fete objects and determine their position using audile cues (Patel et al., 2012). These technologies punctuate the rigidity of the mortal brain and give precious druthers for individualities who cannot calculate on vision. sensitive negotiation systems have the eventuality to round traditional assistive technologies and enhance independence.

Spectrum of Visual Impairment and Educational Needs

Visual impairment encompasses a wide diapason, ranging from mild vision loss to complete blindness (Kim et al., 2021). individualities with low vision may profit from visual aids similar as magnifiers and enhanced lighting, while those with total blindness calculate on indispensable styles similar as braille, audile tools, and screen compendiums (Sharif et al., 2021). Understanding these distinctions is pivotal for designing applicable educational interventions and support systems. acclimatizing educational strategies to the specific requirements of individualities ensures further effective literacy issues and lesser addition (Permvattana et al., 2013).

Generative AI and Availability in Education

Generative AI has surfaced as a transformative technology with significant counteraccusations for availability in education. It enables the creation of content in colorful formats, including textbook, audio, and images, grounded on large datasets (Leiker et al., 2023). In the environment of visual impairment, generative AI can be used to convert visual content into descriptive textbook or audio, making it accessible to scholars. also, it can support individualized literacy by conforming content to individual requirements. The integration of generative AI into educational systems has the implicit to significantly reduce availability walls and promote inclusive literacy surroundings.

Inclusive Education as a Human Right

Inclusive education is extensively honored as a abecedarian mortal right, particularly for individualities with disabilities. The United Nations Convention on the Rights of Persons with Disabilities (CRPD, 2006) emphasizes the significance of furnishing equal educational openings and barring demarcation. Composition 24 of the CRPD highlights the need for inclusive

education systems that support the full development of individualities and enable their effective participation in society. This includes the provision of applicable lodgment, similar as braille instruction, indispensable communication styles, and trained professionals. Inclusive education ensures that all scholars, anyhow of their capacities, can learn together in probative surroundings.

Challenges in Higher Education

Visually disabled scholars in advanced education face unique challenges that extend beyond academic availability. These include difficulties in navigating large premises, penetrating digital coffers, and using institutional installations that are n't designed with availability in mind (Lourens & Swartz, 2016). The lack of assistive technologies in computer labs and other installations further limits their independence. also, scholars frequently witness social insulation and loneliness, which can negatively impact their internal health and academic performance (Kong et al., 2020). Addressing these challenges requires a comprehensive approach that includes structure development, staff training, and the provision of applicable support services.

Economic and Social Impact of Disability

Disability has significant profitable and social counteraccusations at both individual and societal situations. individualities with disabilities frequently face advanced living costs due to the need for technical services and assistive bias (Mitra & Palmer, 2017). In developing countries, these challenges are aggravated by limited coffers and support systems. likewise, disabilities place a fiscal burden on healthcare systems and public husbandry. still, exploration suggests that early intervention and access to education can lead to long- term benefits, including increased productivity and reduced societal costs (Rotarou & Sakellariou, 2019). Investing in inclusive education and assistive technology is thus not only a moral imperative but also an profitable necessity.

Role of Technology and Future Directions

Technological advancements have significantly bettered the availability of education for visually bloodied individualities. From traditional tools similar as braille typewriters to ultramodern inventions like smartphones and wearable bias, assistive technology has evolved fleetly over time. Features similar as screen compendiums (TalkBack and VoiceOver) have come essential tools for availability. also, the integration of AI and other advanced technologies continues to expand the possibilities for inclusive education. As technology evolves, it's essential to insure that these inventions are accessible, affordable, and effectively integrated into educational systems.

Research Methodology

Research Design

The present study adopts a qualitative exploration design in order to explore and understand the lived gests of scholars with visual impairment in exercising AI- driven assistive technologies within advanced education. Qualitative exploration is considered applicable for this study as it facilitates an in- depth disquisition of actors' private gests, comprehensions, and meanings attached to a particular miracle. Specifically, a phenomenological approach is employed, as it aims to capture the substance of individualities' lived gests and provides rich, descriptive perceptivity into how scholars interact with and perceive AI- grounded assistive technologies in their academic lives.

Research Approach

This study is grounded on an interpretivist paradigm, which assumes that reality is socially constructed and can be understood through individualities' gests and interpretations. The interpretivist approach enables the experimenter to gain a deeper understanding of how scholars with visual impairment make sense of their relations with AI- driven assistive technologies in advanced education settings.

Population of the Study

The population of the study comprises all scholars with visual impairment enrolled in advanced education institutions. This includes undergraduate, graduate, and postgraduate scholars who are presently using or have experience using AI- driven assistive technologies for academic purposes.

Sampling Technique

A purposive sampling technique is used in this study to select participants who have direct experience with the phenomenon under investigation. This method allows the researcher to intentionally select individuals who are knowledgeable and can provide rich, relevant, and meaningful data regarding the use of AI-based assistive technologies.

Sample Size

The sample size for this study is anticipated to range between 8 to 15 scholars, which is considered applicable for phenomenological exploration. The final number of a scholars will be determined grounded on data achromatism, that is, the point at which no new themes or perceptivity crop from the data.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- Students with visual impairment enrolled in higher education institutions
- Students who are using or have experience with AI-driven assistive technologies
- Willingness to participate in the study

Exclusion Criteria:

- Students without visual impairment
- Students who do not use any form of AI-based assistive technology
- Participants unwilling to provide informed consent

Data Collection Methods

Data will be collected through semi-structured, in-depth interviews. This system is named as it allows inflexibility for scholars to express their guests in their own words while enabling the experimenter to probe deeper into applicable areas.

An interview companion will be developed grounded on the exploration objects and questions. Interviews may be conducted face- to- face or through online platforms (e.g., drone, WhatsApp calls), depending on scholar's convenience and availability requirements. Each interview is anticipated to last roughly 30 – 60 twinkles and will be audio- recorded with the concurrence of actors.

Research Instrument

The primary instrument for data collection is a semi-structured interview companion. The companion will correspond of open- concluded questions designed to explore scholars' gests, comprehensions, challenges, and the impact of AI-driven assistive technologies on their academic lives.

Validity and Trustworthiness

To insure the responsibility of the study, the following strategies will be employed

- **Credibility**: Member checking will be conducted by participating interview summaries with actors for verification.
- **Transferability**: Thick descriptions will be handed to allow compendiums to determine the connection of findings in other surrounds.
- **Responsibility**: A detailed inspection trail of the exploration process will be maintained.
- **Confirmability**: Experimenter bias will be minimized through reflexivity and attestation of opinions.

Data Analysis Procedure

Data will be anatomized using thematic analysis. The process will involve

1. Recap of interview recordings

2. Familiarization with the data
3. Coding of significant statements
4. Identification of themes and sub-themes
5. Interpretation of meanings

The analysis will follow Braun and Clarke's (2006) six- step frame for thematic analysis to insure methodical and rigorous examination of the data.

Ethical Considerations

Ethical principles will be rigorously followed throughout the study. Informed concurrence will be attained from all actors previous to data collection. Participants will be informed about the purpose of the study, their right to withdraw at any time, and the confidentiality of their responses. Aliases will be used to cover participants' individualities, and all data will be stored securely.

Data Analysis and Findings

This section presents a detailed analysis of qualitative data collected from scholars with visual impairment regarding their lived gests of using AI-driven assistive technologies in advanced education. The data was anatomized using thematic analysis as proposed by Braun and Clarke (2006). The purpose of this analysis is to interpret actors' gests, identify recreating patterns, and develop meaningful themes that reflect their academic, technological, social, and emotional realities.

Data Analysis Process

After recap of interviews, data was precisely read multiple times to insure familiarity. original canons were generated from meaningful statements, which were latterly grouped into orders and broader themes. This methodical process allowed the experimenter to move from raw data to interpreted findings while maintaining actors' original meanings.

Table 1. *Initial Coding*

Participant Statement	Code
"Screen reader helps me read everything"	Accessibility support
"Voice tools sometimes make mistakes"	Technical limitation
"I feel confident using AI tools"	Empowerment
"Internet issues disturb my study"	Connectivity barrier

Explanation:

These codes represent the first position of data reduction where raw statements were simplified into meaningful generalities. This step helps in relating patterns across participants.

THEME 1: Enhanced Academic Accessibility through AI Technologies

Table 2. *Evidence of Accessibility Enhancement*

Statement	Interpretation
"Screen reader reads all my notes"	Easy access to academic content
"OCR converts images into text"	Digital content accessibility
"Voice assistant helps in writing tasks"	Academic facilitation

Explanation:

This theme reflects that AI- driven assistive technologies play a significant part in perfecting academic availability for scholars with visual impairment. Participants constantly reported that tools similar as screen compendiums, optic character recognition (OCR) operations, and voice sidekicks enabled them to singly access literacy accoutrements. This indicates a shift from reliance- grounded literacy to technology-supported independent literacy. Still, availability is not only about vacuity of tools but also about their usability and trust ability in real academic surrounds.

THEME 2: Academic Independence and Psychological Empowerment

Table 3. *Indicators of Independence*

Statement	Meaning
"I do my assignments myself"	Self-reliance
"I don't depend on others anymore"	Reduced dependency
"I feel confident in class"	Confidence building

Explanation: This theme highlights the cerebral and academic commission endured by scholars. AI- driven assistive technologies not only support academic tasks but also enhance tone- confidence and independence. Participants expressed that they felt abler and included in academic conditioning. This demonstrates that technology has a binary part functional (learning support) and cerebral (confidence structure). still, this commission is tentative upon the trust ability of technology and institutional support.

THEME 3: Technological Barriers and Limitations

Table 4. *Reported Challenges*

Issue	Description
Voice errors	Misrecognition of speech
Internet dependency	Interrupted learning
Language issues	Poor Urdu support
High cost	Financial barrier

Explanation:

Despite the benefits, actors reported several challenges that limit effective use of AI technologies. A major issue is inaccurate voice recognition, which affects academic productivity. also, dependence on internet connectivity creates walls in areas with unstable networks. Language limitations, especially lack of strong Urdu support, further reduce usability in original surrounds. fiscal constraints also circumscribe access to advanced bias and applications. This theme indicates that technological advancement alone is not sufficient unless it's contextually acclimated.

THEME 4: Emotional and Social Experiences

Table 5. *Emotional Responses*

Situation	Emotion
Successful use of AI tools	Happiness
System failure	Frustration
Peer support	Inclusion
Lack of help	Isolation

Explanation:

Participants expressed mixed emotional gests. Successful use of AI tools redounded in passions of satisfaction and addition, whereas specialized failures led to frustration and reliance stress. Social gests also varied. probative peers and preceptors enhanced addition, while lack of understanding created passions of insulation. This shows that availability is not purely technological but also deeply social and emotional

THEME 5: Institutional Support and Awareness Gaps

Table 6. *Institutional Situation*

Factor	Status
Teacher training	Limited
Awareness of AI tools	Low
Technical support	Inconsistent

Explanation:

Findings reveal that institutional support for AI-driven assistive technologies is limited. preceptors frequently warrant training in assistive technologies, which reduces effective classroom addition. also, absence of structured availability programs in some institutions leads to inconsistent support for scholars. This indicates a gap between policy-position addition and practical perpetration.

THEME 6: Future Expectations and Recommendations

Table 7. *Student Suggestions*

Suggestion	Purpose
Better Urdu AI support	Linguistic inclusion
Offline functionality	Accessibility improvement
Training workshops	Skill development
Affordable tools	Equal access

Explanation:

Participants showed strong sanguinity about the future of AI in education. still, they emphasized the need for advancements in language processing, affordability, and availability. Training programs were also stressed as essential for both scholars

and preceptors to maximize the benefits of AI technologies.

Major Findings

The findings of the study indicate that AI- driven assistive technologies play a significant part in enhancing the academic gests of scholars with visual impairment in advanced education. Thematic analysis revealed that these technologies ameliorate availability to academic content by enabling scholars to singly use screen compendiums, OCR tools, and voice- supported operations.

The study further set up that these technologies contribute to increased academic independence and tone- confidence among scholars, as they reduce reliance on others for academic tasks. Actors reported feeling further empowered and able of managing their studies effectively.

still, the findings also punctuate several challenges, including specialized limitations similar as voice recognition crimes, lack of Urdu language support, and dependence on stable internet connectivity. fiscal constraints and limited access to advanced bias further circumscribe effective use.

In addition, scholars expressed mixed emotional and social gests. While numerous felt included and motivated through technology use, others endured frustration and insulation when tools were not effective or support was inadequate.

The study also set up that institutional support for AI- driven assistive technologies remains limited, with shy training and mindfulness among faculty members. Despite these challenges, actors showed positive prospects regarding the unborn enhancement and wider relinquishment of AI-grounded assistive technologies in advanced education.

Discussion

The findings of the study indicate that AI- driven assistive technologies significantly contribute to perfecting academic availability for scholars with visual impairment. Actors reported that tools similar as screen compendiums, optic character recognition systems, and voice sidekicks enabled them to pierce academic accoutrements more singly and efficiently. These findings are harmonious with being literature that highlights the positive part of assistive technologies in promoting inclusive education and reducing reliance among learners with disabilities (Edyburn, 2013; Holmes et al., 2019).

likewise, the study revealed that these technologies also contribute to academic independence and cerebral commission. scholars expressed increased confidence and tone- reliance in managing their academic tasks, which reflects the empowering eventuality of AI- grounded tools in educational settings. This suggests that assistive technologies not only address functional limitations but also enhance learners' tone-efficacy and provocation.

still, despite these positive issues, several challenges were linked. Technological limitations similar as voice recognition crimes, lack of Urdu language support, internet reliance, and fiscal constraints significantly hindered the effective use of AI- driven tools. These walls punctuate the patient digital peak, particularly in developing educational surrounds where structure and availability support remain limited.

In addition, the emotional and social gests of actors revealed a complex reality. While numerous scholars endured addition and commission through technology, others reported frustration and insulation when systems failed or when acceptable support was unapproachable. This demonstrates that availability is not only a technological concern but also a social and emotional experience that influences scholars' overall academic well- being.

also, the findings indicate a lack of institutional readiness in supporting AI- driven assistive technologies. Limited schoolteacher training, shy mindfulness, and inadequate availability programs reduce the effectiveness of inclusive education practices. This gap between technological vacuity and institutional perpetration underscores the need

for systemic enhancement in advanced education settings.

Conclusion

This study explored the lived gests of scholars with visual impairment in exercising AI- driven assistive technologies in advanced education. The findings conclude that similar technologies play a vital part in enhancing availability, independence, and academic participation. scholars profit significantly from AI- grounded tools in terms of bettered literacy access and increased confidence in academic conditioning.

still, the study also concludes that the full eventuality of AI- driven assistive technologies is n't yet realized due to patient technological limitations, shy institutional support, and socio-profitable constraints. These challenges produce difference in access and limit the overall effectiveness of inclusive education practices. thus, while AI has transformative eventuality, its success depends on contextual adaption, institutional commitment, and indifferent availability fabrics.

Recommendations

Grounded on the findings of the study, it's recommended that advanced education institutions take visionary way to enhance the availability and effectiveness of AI- driven assistive technologies. Universities should establish structured training programs for both scholars and faculty members to insure effective use and understanding of these technologies. also, devoted availability support units should be developed within institutions to help scholars with visual impairment in navigating digital literacy surroundings.

Faculty members should also be encouraged and trained to borrow inclusive tutoring practices and to design course accoutrements that are compatible with assistive technologies. This includes icing that all digital content is accessible through screen compendiums and other AI-grounded tools. similar practices will help produce a further inclusive and probative academic terrain.

At the policy position, government and educational authorities should develop comprehensive fabrics that promote digital addition in advanced education. fiscal support or subventions should be handed to insure that scholars with disabilities have access to necessary assistive technologies. This would help reduce the being digital and profitable peak.

From a technological perspective, inventors should concentrate on perfecting AI- grounded assistive tools by incorporating support for indigenous languages similar as Urdu, enhancing offline functionality, and icing affordability. stoner- centered design approaches should be prioritized to insure that technologies are aligned with the real requirements of scholars with visual impairment.

Eventually, unborn experimenters are encouraged to conduct studies with larger and further different samples across different educational institutions. relative studies between traditional assistive technologies and AI- driven tools, as well as mixed- system exploration designs, may give deeper and further generalizable perceptivity into this arising field.

Declaration of Conflicting Interest

I have no known conflict of interest to disclose

Funding Statement

I did not receive any funding for this research project.

References

AbouElwafa, A., Selim, N., Alateeq, H., Alzaid, D., Al-Megren, S., & Kurdi, H. (2018). Design and implementation of a voluntary reading mobile application for people who are visually impaired. In *Proceedings of the 6th International Symposium on Innovative Technologies in Engineering and Science (ISITES 2018)* (pp. 645–653). Antalya, Turkey.

Abuhammad, S. (2020). Barriers to distance learning during the COVID-19 outbreak: A qualitative review from parents' perspective. *Heliyon, 6*(11).

Agrawal, S., Agrawal, M., & Padiya, S. (2020). Android application platform based on voice recognition for competitive exams. *International Journal of Advanced Research in Science and Technology, 5*(5).

Akpan, J. P., & Beard, L. A. (2014). Assistive technology and mathematics education. *Universal Journal of Educational Research, 2*(3), 219–222.

Alper, S., & Raharinirina, S. (2006). Assistive technology for individuals with disabilities: A review and synthesis of the literature. *Journal of Special Education Technology, 21*(2), 47–64.

Baker, P. M., et al. (2020). Accessibility challenges in higher education for students with disabilities. *Educational Technology Research and Development*.

Battistin, T., Mercuriali, E., Zanardo, V., Gregori, D., Lorenzoni, G., Nasato, L., & Reffo, M. (2020). Distance support and online intervention for blind and visually impaired children during COVID-19. *Research in Developmental Disabilities, 108*, 1–8.

Brulé, E., Metatla, O., Spiel, K., Kharrufa, A., & Robinson, C. (2019). Evaluating technologies with and for disabled children. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. 1–6). Glasgow, Scotland.

Edyburn, D. L. (2013). Critical issues in advancing the special education technology evidence base. *Exceptional Children, 80*(1), 7–24.

Fichten, C. S., Ferraro, V., Asuncion, J. V., Chwojka, C., Barile, M., Nguyen, M. N., Klomp, R., & Wolforth, J. (2009). Disabilities and e-learning: Problems and solutions. *Journal of Educational Technology & Society, 12*(4), 241–256.

Firat, T. (2021). Experiences of students with visual impairments in higher education: Barriers and facilitators. *British Journal of Special Education, 48*(3), 301–322.

Florian, L., & Black-Hawkins, K. (2011). Exploring inclusive pedagogy. *Cambridge Journal of Education, 41*(4), 813–828.

Fouh, E., Akbar, M., & Shaffer, C. A. (2012). The role of visualization in computer science education. *Computers in the Schools, 29*(1–2), 95–117.

Frank, C. R., Xiang, X., Stagg, B., & Ehrlich, J. (2019). Longitudinal associations of self-reported vision impairment with symptoms of anxiety and depression among older adults in the United States. *JAMA Ophthalmology, 137*, 793–800.

Fuhrer, M. (2003). A framework for the conceptual modelling of assistive technology device outcomes. *Disability and Rehabilitation, 25*(22), 1243–1251.

Gelderblom, G. J., & De Witte, L. P. (2002). The assessment of assistive technology outcomes, effects and costs. *Technology and Disability, 14*(3), 91–94.

Giese, M., Greisbach, M., Meier, M., Neusser, T., & Wetekam, N. (2022). Understanding reasons for students with visual impairments leaving mainstream schooling. *European Journal of Special Needs Education, 37*(2), 264–277.

Glazko, K. S., Yamagami, M., Desai, A., Mack, K. A., Potluri, V., Xu, X., & Mankoff, J. (2023). An autoethnographic case study of generative artificial intelligence's utility for accessibility. In *Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility* (pp. 1–8).

He, X., & Deng, L. (2017). Deep learning for image-to-text generation: A technical overview. *IEEE Signal Processing Magazine, 34*(6), 109–116.

Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education*. Center for Curriculum Redesign.

Hussin, A. (2013). Experiences of students with visual impairments in adoption of digital talking textbooks: An interpretative phenomenological analysis (Doctoral dissertation, Colorado State University).

Jones, M. G. (2014). The efficacy of haptic simulations for students with visual impairments. *Journal of Visual Impairment & Blindness, 108*(1), 55–61.

Jwaifell, F., & Gasaymeh, A. (2013). Using diffusion of innovation theory in education. *Contemporary Educational Technology, 4*(2), 138–149.

Koweru, R. A., Omoke, C. M., & Orodho, J. A. (2015). Role of assistive technologies on educational outcomes. *IOSR Journal of Humanities and Social Science, 20*(3), 39–50.

Landrum, T. J., Tankersley, M., & Kauffman, J. M. (2003). Emotional and behavioral disorders in education. *The Journal of Special Education, 37*(3), 148–156.

Lang, R. (2007). The development and critique of the social model of disability. Leonard Cheshire Disability and Inclusive Development Centre.

Lemon, L. L., & Hayes, J. (2020). Enhancing trustworthiness of qualitative findings. *The Qualitative Report, 25*(3), 604–614.

Meleo-Erwin, Z., et al. (2021). Online learning and disability during COVID-19. *Disability and Health Journal, 14*(1).

Mayo, A. M., Dijkman, B., Blankendaal, R., & Crajé, C. (2017). Impact of assistive technology on quality of life. *Assistive Technology, 10*, 44–53.

Rose, D. H., & Meyer, A. (2002). *Teaching every student in the digital age: Universal design for learning*. ASCD.

Rose, D. H., Hasselbring, T. S., Stahl, S., & Zabala, J. (2005). Assistive technology and universal design for learning. In *Handbook of special education technology research and practice* (pp. 507–518).

Shinohara, K., & Wobbrock, J. O. (2016). Self-conscious or self-confident? *ACM Transactions on Accessible Computing, 8*(2).

World Health Organization. (2023). *World report on vision*.