P-ISSN 2664-0422	Pakistan Social Sciences Review	April-June 2024, Vol. 8, No. 2 (S)
O-ISSN 2664-0430	https://doi.org/10.35484/pssr.2024(8-II-S)28	[248-258]

Pakistan Social Sciences Review
www.pssr.org.pk

RESEARCH PAPER

Exploring the Accessible Modes used by students with Visual Impairment in University Examination System: Challenges and Prospects

[1] Dr. Zahida Parveen*, [2]Smia Mukhtar and [3]Maria Jameel

1. Associate Professor, Department of special education, Division of Education, University of Education, Lahore, Punjab, Pakistan
2. Ph. D Scholar, Department of Special Education, Division of Education, University of Education, Lahore, Punjab, Pakistan
3. M.Phil., Psychology, Institute of Southern Punjab, Multan

***Corresponding Author:** Zahida.parveen@ue.edu.pk

ABSTRACT

This study aims to examine how visually impaired students navigate university examinations, identifying the obstacles they encounter and proposing ways to improve accessibility. The accessibility of examination systems for students with visual impairments is a critical issue in higher education, requiring ongoing efforts to ensure equitable academic opportunities. Participants included 10 visually impaired students from the Department of Special Education at the University of Education, Lahore, enrolled in various higher education programs. Using qualitative methods, specifically focus group discussions, the study examined their experiences and aspirations regarding examination accessibility. Findings reveal significant issues such as delays in obtaining Braille versions, difficulties with complex diagrams, and improperly formatted digital texts. While assistive technologies like screen readers and Braille displays are helpful, they often face technical issues, highlighting the need for regular updates and better technical support. Recommendations include the timely provision of accessible materials, increased availability of support personnel, enhanced communication, and practice sessions with accommodations to boost preparedness and confidence. Addressing these challenges will create a more inclusive and supportive examination environment, ensuring equitable opportunities for visually impaired students.

KEYWORDS Accessible Mode, University Examination, Visual Impairment

Introduction

In recent decades, integrating visually impaired students into mainstream education has gained prominence, driven by inclusive education policies encouraging universities to meet these students' diverse needs, especially in examination systems (UNESCO, 1994). Despite significant efforts, challenges persist in providing equitable assessment methods in higher education. This introduction explores the accessible examination modes for visually impaired students, the challenges they face, and potential improvements through action research.

Action research, known for its participatory and iterative approach, is effective in tackling educational accessibility challenges. By involving students, educators, administrators, and policymakers in a cycle of planning, action, observation, and reflection, universities can better understand and address the needs of visually impaired students (Stringer, 2013). This method helps implement practical solutions, enhancing the academic experiences of these students.

Accessible examination methods for visually impaired students include the use of various assistive technologies such as screen readers, Braille displays, and magnification software. These technologies have revolutionized educational accessibility by enabling visually impaired students to independently access exam materials and interact with digital content according to their individual needs (Hersh & Johnson, 2010). However, challenges such as software compatibility issues, the high cost of assistive devices, and the necessity for specialized training can hinder the effective use and widespread adoption of these technologies. Without sufficient support and resources, visually impaired students may struggle to access exams equitably compared to their peers.

Neupane's study (2022) meticulously investigates the intricate factors influencing the school participation of visually impaired children, examining the challenges and facilitators that shape their educational journeys. By analyzing determinants such as access to educational resources, support services, and accommodations, Neupane highlights the complexities surrounding school attendance and engagement for visually impaired students. The study also explores socio-economic, cultural, and environmental factors, providing valuable insights into how these elements intersect with visual impairment to impact educational outcomes.

The importance of ensuring accessible examination modes for visually impaired students is underscored by the significant challenges posed by traditional exam formats. Standard written exams often fail to meet the specific needs of these students, creating obstacles in accessing content and demonstrating knowledge. Issues such as the reliance on screen readers or Braille and the additional time required to navigate accessible formats can disproportionately affect visually impaired students, emphasizing the need for tailored interventions and policies to promote inclusivity in educational settings (Neupane, 2022).

Research by Hanushek, Kain, and Rivkin (2003) underscores the importance of alternative examination formats in enhancing the assessment process for visually impaired students. Methods such as oral exams, extended time allocations, and the use of assistive technologies significantly improve accessibility and inclusivity, providing equitable opportunities for these students to demonstrate their understanding and capabilities. Despite the benefits, universities face challenges in implementing these accessible modes due to resource constraints, insufficient faculty training, and a lack of standardized guidelines (Koutsoklenis et al., 2009). Engaging visually impaired students as co-researchers through action research can ensure their perspectives inform the development of inclusive examination practices, leading to more relevant and sustainable solutions (Stringer, 2013).

Looking forward, the integration of innovative technologies and inclusive pedagogical strategies holds promise for transforming examinations for visually impaired students. Advances in digital accessibility, such as sophisticated screen reading software and tactile graphics, enable students to independently access exam content on par with their peers (Burgstahler, 2015). Additionally, the emphasis on universal design for learning (UDL) principles promotes the creation of flexible learning environments that accommodate diverse needs. UDL aims to provide multiple means of representation, expression, and engagement, enhancing the learning experience for all students and fostering a more inclusive and supportive educational environment (Rao, Ok, & Bryant, 2014). Combining advanced assistive technologies and UDL principles can significantly improve the accessibility and equity of examination systems, ensuring fair and meaningful opportunities for visually impaired students.

The accessibility of examination systems for students with visual impairments remains a critical issue in higher education, necessitating continuous efforts to ensure equal academic opportunities. These students often depend on accessible formats such as Braille, large print, screen readers, and audio software to complete their exams. However, significant challenges persist, including delays in receiving materials, difficulties with complex diagrams, and inconsistencies in digital text formatting, which can impede their academic performance and increase stress (Hewett et al., 2020). This study aims to explore the accessible modes used by visually impaired students, identify the challenges they face, and propose strategies to enhance the examination system to better support these students.

Literature Review

Visual impairment encompasses a range of conditions affecting vision, from mild impairments to total blindness. The World Health Organization (WHO) reports that approximately 2.2 billion people worldwide have vision impairment, with 1 billion experiencing moderate to severe impairments impacting daily life (WHO, 2020). Many of these individuals are students in educational institutions.

In higher education, visually impaired students face challenges in accessing learning materials, participating in classroom activities, and taking exams. Despite advancements in assistive technologies, ensuring accessibility remains a significant issue globally (WHO, 2021). Ensuring accessible examination systems is crucial for promoting inclusivity and equal opportunities, allowing all students to demonstrate their knowledge on an equal footing and complying with disability rights legislation (UNESCO, 2020).

Accessible Examination Modes

Accessible examination modes for visually impaired students have evolved from traditional methods like oral exams and Braille to modern technological approaches. Historically, oral exams allowed students to verbally respond to questions, leveraging their auditory and tactile communication strengths (Harley, Truan, & Sanford, 2010). Braille, a tactile writing system, has also been essential for providing access to written information during exams (Lorimer, 1996).

With technological advancements, there has been a significant shift towards modern techniques such as screen readers and audio exams. Screen readers convert digital text into synthesized speech or refreshable Braille displays, enabling visually impaired students to navigate online examination platforms more independently and efficiently (Douglas, McLinden, & McCall, 2019). Audio exams, presenting questions orally through recorded audio files, cater to auditory strengths and offer an alternative to text-based exams (Mulligan, 2013). These modern methods enhance accessibility and inclusivity, bridging the gap between traditional limitations and contemporary possibilities in educational assessments.

Current Accessible Examination Modes

Digital Texts and Screen Readers: Digital texts, such as PDF or Word documents, enable visually impaired students to utilize screen readers, converting text into speech or Braille displays. This independence-enhancing tool allows students to navigate examination materials autonomously, fostering inclusivity in academic environments (Mishra, 2023).

Braille and Tactile Graphics

Braille and tactile graphics are indispensable for visually impaired students in accessing written information and interpreting complex visual concepts during exams. Integrating tactile graphics with Braille text aids in understanding intricate details crucial for academic success (D'Andrea, 2012).

Audio Exams

Audio exams, delivered orally, provide visually impaired students with an accessible alternative to traditional text-based exams. This format eliminates the need for visual reading and writing, enhancing accessibility and enabling students to demonstrate their knowledge effectively (Maurya & Maurya, 2018).

Human Assistants/Scribes

Classroom assistants play a vital role in supporting visually impaired students by providing essential services such as reading aloud and adapting resources. Tailored support from assistants promotes full participation in learning and contributes to an inclusive educational environment (McClelland et al., 2023).

Computer-Based Testing with Accessibility Features

Computer-based testing platforms with accessibility features offer customizable options like adjustable font sizes and text-to-speech functionality. These features cater to diverse learning needs, empowering visually impaired students to engage effectively with examination tasks (Hansen, Forer, & Lee).

Challenges in Accessible Examination Modes

Ensuring accessibility for visually impaired students in examination settings is fraught with various challenges that span technological, institutional, psychosocial, and logistical domains. These challenges pose significant barriers to the equitable participation and success of visually impaired students in academic assessments.

Technological Barriers

Availability and Reliability of Assistive Technologies: Hemmingsson et al. (2009) highlight that students often face technological barriers when using assistive technology devices in educational settings. These barriers include device compatibility issues, usability problems, and limited technical support. Challenges such as insufficient training and inadequate infrastructure further hinder the effective integration of assistive technology, with device reliability and maintenance issues compounding the problem.

Compatibility Issues with Standard Examination Software

Belay (2020) found that visually impaired students struggle with standard examination software due to compatibility issues. Problems such as incompatible file formats, limited support for screen readers, and inaccessible user interfaces make the software difficult to navigate, hindering equitable access to examination materials. Addressing these compatibility issues is crucial for enhancing inclusivity and ensuring equal opportunities.

Psychosocial Barriers

Kapur (2018) identified psychological barriers as significant challenges for visually impaired students, including low self-esteem, anxiety, and feelings of inadequacy. These students may internalize stigma or negative self-perceptions due to their disability, impacting their confidence and motivation. The lack of accommodations and inclusive environments exacerbates feelings of frustration and isolation, highlighting the need for comprehensive support systems like counseling, peer support groups, and advocacy for inclusive education.

Prospects for Improving Accessibility

Improving accessibility for visually impaired students in examination systems necessitates a multi-faceted approach that encompasses technological innovation, policy, and institutional reforms, as well as educational and training programs. These prospects hold promise for addressing existing barriers and advancing inclusive practices in assessment environments.

Technological Innovations

Exploration of Assistive Technologies: Linda et al. (2018) conducted an extensive exploration of assistive technologies for individuals with disabilities, covering both established and emerging tools. This comprehensive study encompasses a wide range of assistive technologies, from traditional aids to cutting-edge innovations, designed to address diverse needs across various disabilities, including mobility impairments, sensory challenges, cognitive limitations, and communication barriers.

Transformative Potential of Emerging Technologies

The research by Linda et al. (2018) highlights the transformative potential of emerging technologies in the realm of assistive devices. Advancements in robotics, artificial intelligence, wearable devices, and smart home technology hold promise for revolutionizing the field of assistive technology. By embracing these innovative solutions, individuals with disabilities can gain greater independence, autonomy, and inclusion in crucial aspects of life, such as education, employment, social engagement, and daily living activities.

Policy and Institutional Reforms

Implementation of Comprehensive Accessibility Policies

Educational institutions and examination bodies can promote accessibility and inclusivity by implementing comprehensive policies that mandate accommodations and support services for visually impaired students. These policies should include guidelines for accessible examination formats, procurement of assistive technologies, and staff training on disability awareness and accommodation practices (UNESCO, 2020).

Material and Methods

Participants

The participants of the study were 10 visually impaired students enrolled in higher education programs at Department of Special Education, University of Education, Lahore. The programs included Bachelor of Science (BS), Master of Philosophy (MPhil),

and similar academic pursuits. These students were actively engaged in pursuing their respective degrees within the university setting. As visually impaired individuals, they faced unique challenges and barriers in accessing educational materials and navigating the academic environment. Despite these obstacles, they demonstrated resilience and determination in pursuing their academic goals. Their experiences and perspectives were central to the study, providing valuable insights into the accessibility and inclusivity of higher education for visually impaired students.

In exploring the accessible modes utilized by students with visual impairments in the university examination system, the researcher opted for qualitative methods to delve deeply into the nuances of their experiences. Recognizing the richness of qualitative data in capturing diverse perspectives and intricate details, the researcher employed focus group discussions as a primary means of data collection. Through these discussions, participants were invited to share their insights, challenges, and aspirations regarding the examination system. By engaging in open-ended conversations within a group setting, the researcher aimed to foster a collaborative environment where participants could interact, exchange ideas, and build upon each other's experiences. This methodological approach not only allowed for a comprehensive exploration of the topic but also facilitated the identification of common themes and patterns across participants' narratives.

During the focus group discussions, participants were encouraged to reflect on their encounters with various examination materials, technological supports, and accommodations provided by the university. The discussions provided a platform for participants to articulate their perspectives on the effectiveness of these accessible modes and to express any unmet needs or areas for improvement. By employing a qualitative methodology grounded in participant experiences, the researcher sought to gain a holistic understanding of the challenges faced by students with visual impairments in navigating the examination system, as well as to illuminate potential prospects for enhancing accessibility and inclusivity. Through rigorous data analysis and interpretation, the researcher aimed to uncover valuable insights that could inform the development of more equitable and supportive practices within the university examination system.

Validity and Reliability

Ensuring the validity and reliability of the qualitative method employed to explore accessible modes used by students with visual impairments in the university examination system is critical for the credibility of the research findings. Validity was upheld through the use of open-ended questions during focus group discussions, allowing participants to freely articulate their experiences and perceptions. Additionally, the researcher practiced reflexivity to acknowledge and mitigate potential biases. Reliability was maintained through standardized procedures in conducting focus group discussions, consistent facilitation techniques, and systematic data analysis methods. Member checking further bolstered reliability, as participants were given the opportunity to validate the accuracy and interpretation of the findings. These methodological strategies collectively contributed to the trustworthiness of the research, enhancing confidence in the validity and reliability of the qualitative approach utilized in this study.

Ethical Considerations

Ethical considerations are paramount in research involving vulnerable populations, such as students with visual impairments. In this study, exploring accessible modes used in the university examination system, ensuring the protection of participants' rights, dignity, and confidentiality was of utmost importance. Informed consent was obtained from all participants, outlining the purpose of the study, their rights, and the voluntary nature of their participation. Participants were assured of their anonymity, and any identifying information was kept confidential.

Results and Discussion

Accessibility of Exam Materials

The theme reflected in the responses revolves around the accessibility challenges faced by students with visual impairments regarding examination materials provided by the university. Notably, Participant 1 highlights the common issue of delays in obtaining Braille versions, while Participant 2 emphasizes struggles with figures and diagrams despite the generally accessible large print materials. These challenges are further echoed by Participant 6, who mentions encountering problems with improperly formatted digital text. Despite some positive aspects, such as the effectiveness of digital text for Participant 3 and the availability of preferred formats like large print for Participant 5, the overall theme underscores the need for improvements to ensure timely access and clarity of examination materials for students with visual impairments.

Technological Support Effectiveness

These responses are about how helpful different technologies are for students with visual impairments during exams. Participant 1 says screen readers are usually good but sometimes struggle with complex tables and graphs. Participant 2 talks about how audio software is helpful but can have technical problems. Participant 3 likes using Braille displays but wishes there was more help available if something goes wrong. Participant 4 is worried about some exam software not working well with screen readers. Lastly, Participant 7 mentions that digital text needs to be formatted properly for screen readers to work. Overall, these responses show that while these technologies can be helpful, they also have some problems, so they need to be improved and updated regularly.

Effective Accommodations for Visual Impairments

Participants express the effectiveness of various accommodations for students with visual impairments during exams. Participant 1 emphasizes the importance of extended time for processing information, alongside the need for more trained scribes to support their needs. Similarly, Participant 2 finds separate rooms crucial for a quiet environment and suggests additional training for invigilators to assist visually impaired students. Additionally, Participant 3 highlights the significance of scribe services during handwritten exams, while suggesting the necessity for more available scribes due to scheduling challenges. These responses underscore the importance of tailored accommodations such as extended time, separate rooms, and scribe services, while also advocating for improvements and additional support to ensure equitable exam experiences for students with visual impairments.

Communication Effectiveness in Accessibility Coordination

Participants provide insights into the effectiveness of communication between disability support services and faculty in ensuring accessible exams. Participant 1 notes occasional lapses where faculty members are unaware of accommodations, causing delays. Participant 2 echoes this sentiment, emphasizing the need for follow-up due to occasional information loss. Participant 3 offers a more positive perspective, citing proactive communication from disability support services but acknowledges coordination issues with certain professors. Conversely, Participant 4 highlights inconsistency, with some professors accommodating well and others being uninformed until the last minute. Overall, these responses underscore the importance of consistent and proactive communication between disability support services and faculty to ensure timely and effective accommodation provision for students with disabilities during exams.

Challenges of Visual Impairment in Exams

Participants shed light on the significant challenges they face during exams due to their visual impairments. Participant 1 highlights difficulties in accessing diagrams and charts, which are often inadequately described. Participant 2 emphasizes the challenge of timing, particularly with the added pressure of using slower assistive technologies. Participant 3 underscores the disruptive nature of technical issues with assistive devices, which can severely impact performance if malfunctions occur during exams. Additionally, Participant 4 mentions inconsistency in accessible format provision, making it difficult to read materials with a screen reader. These responses collectively highlight the multifaceted challenges faced by students with visual impairments during exams, ranging from accessing information effectively to managing technical issues and coping with stress and anxiety.

Improving Examination Support for Visually Impaired Students

Participants advocate for various improvements in the examination system to better support visually impaired students. Participant 1 emphasizes the importance of standardized and timely provision of accessible materials to reduce stress. Participant 3 calls for increased availability of trained scribes and technical support during exams, stressing the need for immediate assistance in case of issues. Additionally, Participant 5 suggests offering practice sessions with accommodation and technologies used during exams to enhance student preparedness and confidence. These responses collectively underscore the importance of proactive measures such as better training for faculty, improved communication between disability support services and faculty, and the implementation of systems for immediate feedback and adjustments to ensure a more inclusive and supportive examination environment for visually impaired students.

Conclusion

The participants' responses highlight the varied challenges faced by visually impaired students in the examination system. These encompass issues with accessibility, technological supports, accommodations, communication, and unique exam-related challenges. The overarching theme emphasizes the necessity for improvements in examination support, including standardized provision of accessible materials, increased support personnel availability, enhanced communication, and feedback mechanisms. Addressing these challenges will lead to a more inclusive and supportive environment for visually impaired students, ensuring equitable opportunities in education.

Recommendations

This research suggests Implementing a streamlined process to ensure timely availability of exam materials in accessible formats such as Braille, audio, large print, and properly formatted digital text. There is a need to Increase the availability of accommodations such as extended time, separate rooms, scribe services, and technical support, considering the individual needs and preferences of visually impaired students. Coordination among students and teachers need to be enhanced and training programs for faculty, invigilators, and support staff shall be arranged to raise awareness about the needs and challenges of visually impaired students and how to effectively support them during exams. It is also recommended to offer Organize practice sessions with the same accommodations and technologies used during exams to familiarize visually impaired students with the exam environment, reducing anxiety and enhancing confidence.

References

Burgstahler, S. (2015). *Universal Design in Higher Education: From Principles to Practice*. Harvard Education Press.

D'Andrea, F. M. (2012). Preferences and Practices Among Students Who Read Braille and Use Assistive Technology. *Journal of Visual Impairment & Blindness, 106(10), 585-596.*

Douglas, G., McLinden, M., & McCall, S. (2019). Access to Print Literacy for Children and Young People with Visual Impairment: Implications for Policy and Practice. *International Journal of Inclusive Education, 23(2), 101-120.*

Hansen, E. G., Forer, D. C., & Lee, M. J. (Year). *Toward Accessible Computer-Based Tests*: Prototypes for Visual and Other Disabilities.

Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2003). Teachers, schools, and academic achievement. *Econometrica, 417-458*.

Harley, R. K., Truan, M. B., & Sanford, L. D. (2010). *Communication Skills for Visually Impaired Learners.* Charles C Thomas Publisher.

Hemmingsson, Helena & Lidström, Helene & Nygård, Louise. (2009). *Assistive technology devices in educational settings: Students' perspective*. Assistive technology research series. 25. 619-621. 10.3233/978-1-60750-042-1-619.

Hersh, M. A., & Johnson, M. A. (2010). Assistive technology for visually impaired and blind people. *In Springer Handbook of Automation (pp. 873-895).* Springer, Berlin, Heidelberg.

Hewett, R., Douglas, G., McLinden, M., & Keil, S. (2020). Developing accessible resources for visually impaired students in higher education: Perceptions of accessibility and access. *British Journal of Visual Impairment, 38*(1), 66-77.

Koutsoklenis, A., Papadopoulos, K., Papakonstantinou, D., & Koustriava, E. (2009). *Students with Visual Impairments in Higher Education Institutes*.

Linda, Nierling & Maia, Maria & Hennen, Leonhard & Wolbring, Gregor & Bratan, Tanja & Kukk, Piret & Cas, Johann & Capari, Leo & Krieger-Lamina, Jaro & Mordini, Emilio. (2018). Assistive technologies for people with disabilities - *Part II: Current and emerging technologies. 10.2861/567013.*

Lorimer, P. (1996). *Reading in Braille: An introductory sourcebook for teachers.* American Foundation for the Blind.

Maurya, H., & Maurya, H. (2018). Assistive Technology for Students with Visual Impairment in Inclusive Education.

Mishra, S. (2023). Assistive Technologies for Visual Impairment Enhancing Access to Library Resources. *Library Philosophy and Practice (e-journal). University of Nebraska - Lincoln.*

Mulligan, D. (2013). Strategies for Teaching Students with Vision Impairments. *Journal of Special Education Technology, 28(4), 1-12.*

Neupane, D. (2022). Factors Affecting School Participation of Visually Impaired Children. *Scholars' Journal, 5(1), 108-121. https://doi.org/10.3126/scholars.v5i1.55789.*

Stringer, E. T. (2013). Action research. *Sage Publications.*