

The Inclusion of Students with Visual Impairment on E-learning Platforms post-COVID-19 In Zimbabwe - Towards Equity and Quality Education

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ABSTRACT

E-learning platforms have become a common mode of learning for university students since the onset of the COVID-19 pandemic. Students with visual impairment are not exempt from using these platforms. This study aimed to investigate the experiences of students with visual impairments regarding their inclusion on e-learning platforms at a state university in Zimbabwe in the post-COVID-19 period. The study employed a qualitative case study informed by the constructivist paradigm. Five students with visual impairments enrolled in different faculties, five lecturers, and five ICT personnel were purposefully selected due to their rich information they held, relevant to the study. The findings revealed that university students with visual impairments were largely excluded from e-learning platforms, and that the university had minimal assistive technology available for students with disabilities. These students require enhanced support services, particularly access to assistive technology. Participants recommended that the university maintain records of students with visual impairments to facilitate targeted teaching by lecturers, and that assistive technologies, like computers with JAWS screen readers and NVDA software, be provided on a loan basis for off-campus use. The study recommends that further research be conducted on a larger scale to strengthen support services for students with visual impairments and other disabilities at the university.

Keywords: *Inclusion; e-learning; students with visual impairment; COVID-19; assistive technology; equity; quality.*

INTRODUCTION

According to UNESCO (2020), more than 1.5 billion learners across approximately 165 countries were affected by school and university closures due to the COVID-19 pandemic. This global crisis compelled educational institutions all across the globe to embrace e-learning as an alternative mode of instruction (Buabeng-Andoh, 2024). Supporting this shift, Magomedov, Khaliev & Khubolov (2020) found that the pandemic led to the widespread shutdown of education systems pushing universities worldwide to transition from traditional face-to-face lectures to online learning. Singh & Thurman (2019) defined e-learning as an educational experience conducted via internet-connected computers in synchronous or asynchronous settings, allowing students to engage with instructors and peers without being physically present. In Ghana, the University of Education implemented an online learning system called Virtual Classroom (VCLASS), a programme that simulates face-to-face instruction methods to facilitate management and accounting. Additionally, it serves as a hub of instructional resources, dialogue, grading, and e-assessment (Buabeng-Andoh, 2024). Related scenarios were reported globally, and in Africa, examples include the USA, Korea, Tanzania, Namibia, Eswatini, and South Africa (Gill et al., 2017; Park & Hyo-Jeong, 2019; Lannan, 2019; Eligi, 2017). Zimbabwe was also subjected to this development. According to Zenda, Muriza & Mujuru (2024), during the COVID-19 pandemic in Zimbabwe, online education was believed to be effective and convenient and facilitated access to information.

Inclusive education has been widely accepted as a fundamental principle in modern education systems, particularly concerning persons with disabilities. The concept was formalised through international frameworks such as the Salamanca Statement (UNESCO, 1994), which emphasised the right of all children, including those with disabilities, to access mainstream education. Over time, global policies, including the United Nations Convention on the Rights of Persons with Disabilities

(UNRPD, 2006) and Sustainable Development Goal 4 (SDG4) by UNICEF (2005), have further reinforced the commitment to inclusive, equitable, and quality education. According to Weiner (2003), inclusion is rooted in the belief that education is a human right and the foundation of a just society. Ainscow (2020) supports this view by defining inclusive education as a continuous process of addressing diversity to ensure all learners participate and achieve their fullest potential. The above declarations imply that e-learning as a learning platform should be accessible to "All" students. Enabling equal accessible and quality education calls for addressing barriers. Gill, Sharma & Gupta (2017) assert that inclusive education must focus on overcoming systemic barriers rather than expecting students to adapt to inflexible structures. UNICEF (2024) argues that exclusion stems from educational systems rather than students' characteristics, advocating for structural reforms that accommodate all learners. Following the adoption of these legal frameworks, member states that are signatories to the conventions reaffirmed their commitment to ensuring that students with disabilities have access to equal and quality education. When COVID-19 struck in 2020, students with disabilities, particularly those with visual impairment, were already enrolled in schools and tertiary institutions and were subjected to e-learning platforms like alongside their peers.

Zenda, Muriza & Mujuru (2024) observed that in Zimbabwe during COVID-19, online education delivery proved effective, convenient, and enhanced access to information. Most universities utilised Google Suite applications for education, administered by the Information and Technology Departments. Institutions such as, Great Zimbabwe University adopted Google Meet to facilitate communication and learning (Chingara et al., 2021; Muchabaiwa & Gondo, 2022). The University of Zimbabwe also utilizes the e-Compass platform, which lecturers and students use to post lecture notes, assignments, and examinations. The introduction of blended learning across most Zimbabwean universities revolutionised education by equipping both lecturers and students with essential ICT skills for virtual and physical classrooms, thereby establishing a new standard in learning (Zenda et al., 2024).

After the COVID-19 pandemic, online and virtual learning in universities globally experienced significant evolution and integration, initially driven by the necessity of the pandemic. Many universities adopted and expanded online teaching platforms, and as the situation stabilised, some institutions continued to offer hybrid learning models that combine face-to-face and online elements to accommodate the diverse needs of students (Selingo, Clark & Wittmayer, 2021; Wang et al., 2024). However, inclusivity challenges remain; for instance, the Google Classroom student manual lacks features designed for visually impaired learners, highlighting the urgent need for more tailored e-learning solutions. Including students with visual impairments in e-learning platforms post-COVID-19 is critical to achieving equity and quality education in Zimbabwe. Previous research has shown that the transition to online teaching during COVID-19 enabled the continuation of education during shutdowns. Nevertheless, UNESCO (2022) highlighted that the pandemic disproportionately affected vulnerable learners, particularly students with disabilities. Research by Petsokane & Matjila (2022) and Montenegro-Ruendam et al. (2022) revealed that students with visual impairments in higher education institutions were among the most negatively impacted, as accessibility barriers hindered their participation in e-learning platforms. In Zimbabwe, the Disability Policy (2021) acknowledges that most e-learning development initiatives follow a one-size-fits-all approach, failing to address the specific needs of students with disabilities.

Visual Impairment is defined by the American Foundation for the Blind (2002) as a visual acuity of 20/70 or worse in the better eye with the best possible correction or a total visual field loss of 140 degrees. Visual impairment may also involve difficulties in adapting to light or darkness, as well as sensitivity to light/dark contrasts or glare. These characteristics can significantly limit the inclusion of students with visual impairments in university e-learning platforms. In 2015, it was estimated that there were approximately 253 million with visual impairments worldwide, of whom 36 million were blind and 217 million had moderate to severe visual impairments (Ackland et al., 2017). In Zimbabwe, the National Disability Policy (2021) reported that 24 % of the population comprises

persons with visual impairments. Furthermore, the then Minister of Higher and Tertiary Education, Science and Development, cited in Mashinga (2021), stated that Zimbabwean universities had enrolled 336 students with disabilities, including those with visual impairments, physical challenges, hearing impairments, albinism and speech impairments, in inclusive university setups.

Visual impairment is commonly classified as a low-incidence, high-need disability and presents unique challenges, particularly in the provision of assistive technology (Miyauchi, 2020). The availability of appropriate assistive technology is crucial for the successful inclusion of students with visual impairments on e-learning platforms and for promoting equity and quality education (UNICEF, 2017; Khribi, 2021). Assistive technology is defined by Scherer (2002) as any item, piece of equipment, or product system, whether commercially acquired, modified, or customised, that is used to increase, maintain, or improve the functional capabilities of individuals with disabilities. These may include but are not limited to screen readers, screen magnifiers, speech recognition software, (TTS) software, and text-to-speech (TTS) software (The Royal Institute for the Blind, 2014; Assie, 2021). These technologies enable students with visual impairments to access digital information on computers, tablets or mobile phones (Montenegro-Ruenda et al., 2022). The critical need for specific assistive technologies for students with visual impairments has been previously reported, including in studies conducted in Canada (Read & Curtis, 2011).

The study's background firmly establishes that inclusive e-learning for students with disabilities during and after the COVID-19 pandemic is not just necessary but a fundamental right. The background also highlights that students with visual impairments are enrolled in tertiary institutions both globally and within Zimbabwe; however, accessibility challenges persist, thereby compromising equity and the quality of education. Against this backdrop, the study sought to investigate how students with visual impairments experience their inclusion on e-learning platforms and to establish strategies that could enable stakeholders to enhance e-learning accessibility for these students. Therefore, the study sought to answer the following sub-research questions.

1. What are the experiences of university students with visual impairment concerning the challenges they face in accessing university e-learning platforms
2. How can the university improve its service provision so that students with visual impairments can access e-learning platforms?

THE SIGNIFICANCE OF THE STUDY

This study contributes to the ongoing discourse on inclusive education, particularly in the context of digital learning in the post-COVID-19 era. It is also hoped that the study may be used as a springboard for further enquiry into inclusive digital education fostering innovation and development in assistive technology and inclusive pedagogy.

CONCEPTUAL FRAMEWORK

This study was anchored in the Equity and Inclusive Education Framework, derived from the 2030 Agenda for Sustainable Development (ASD), specifically Sustainable Development Goal 4 (SDG 4) (United Nations, 2015). SDG 4 underscores the importance of ensuring inclusive and equitable quality education, serving as a foundation for promoting fairness and accessibility in higher and tertiary education. Inclusion is closely linked to diversity (Nodelana & Aamaas, 2018), equity (Goodwich, 2012), and equality (Lundahl, Rapp & Corral-Granados, 2024). Thus, equity plays a central role in ensuring that every learner has equal opportunities for academic success (Ejaz, Shabir, Javed & Afab, 2024).

The Equity and Inclusive Education Framework underpinning this study is founded on three core principles: equity in access, participation, and outcomes. Equity outcomes are evaluated through

indicators such as accessibility, participation, and learning achievements (OECD, 2021). Consequently, equity is a critical determinant of overall educational quality (Brussionno & Mezzanotte, 2021). Previous research has demonstrated that quality education fosters inclusivity, equity, and lifelong learning opportunities for all (A4ID, 2022). Therefore, students with visual impairments must experience a holistic education, extending beyond mere access to ensure a rich, engaging, and supportive learning environment. Quality education entails adequate support systems (Jardinez & de Vera, 2024), which are essential for overcoming barriers to e-learning. This principle informed the study's investigation into the challenges students with visual impairments face in accessing university e-learning platforms, aiming to develop strategies to enhance accessibility for all learners.

Accessibility in e-Learning

Osslannisson & Landgrel (2012) asserted that accessibility is an essential element of high-quality education, emphasizing the need for universities to implement inclusive practices and allocate adequate resources to enhance accessibility. Quality education is enhanced through the provision of accessible instructional materials, such as screen readers, high-contrast displays, and other assistive technologies, as well as inclusive teaching strategies, including the use of alternative assessments (Kerdar, Bachler & Kirchhoff, 2024). Without equity, quality education remains unattainable for students with visual impairments. By enhancing accessibility and inclusion, universities can create fair and equal e-learning environments that accommodate all learners (Jardinez & de Vera, 2024; Kerdar, Bachler & Kirchhoff, 2024).

Quality education for all

Quality education is a core principle of education for sustainable development, contributing to both individual and community growth (UNESCO, 2014; UNESCO, 2020; Taneja-Johansson, 2025). For students with visual impairments, quality education must go beyond basic access to foster an engaging, inclusive, and supportive learning experience. This suggests that schools and institutions must go beyond meeting minimum accessibility requirements and focus on fostering an environment where students with visual impairments can actively participate, feel supported, and thrive academically. According to Brussionno et al. (2021), quality education must be accessible, affordable, and inclusive for all learners, and universities bear the responsibility of ensuring effective e-learning implementation. In alignment with these principles, the Equity and Inclusive Education Framework provided the foundation for this study, enabling an in-depth exploration of the inclusion of students with visual impairments from multiple perspectives. Consistent with these principles, the Equity and Inclusive Education Framework underpins this study, facilitating a comprehensive exploration of the inclusion of students with visual impairments from diverse perspectives. The next section presents a review of related literature.

LITERATURE REVIEW

Recently, much research has been conducted globally on the experiences of students with visual impairments regarding the accessibility of e-learning platforms in higher learning institutions. The studies established that developed countries had e-learning platforms modified for students with visual impairments. For example, research in Delhi, Korea, USA, Tanzania and Namibia revealed that e-learning was a significant opportunity for students with visual impairments to access equitable and quality university curriculum (Gill et al., 2017; Park & Hyo-Jeong, 2019; Lannan, 2019; Eligi, 2017), but the students with visual impairments would need assistive technologies to access e-learning platforms. Sharma & Gupta (2017) revealed that Indian students with visual impairment were supported by assistive technologies like screen reading software, JAWS, NVDA, and Eloquence. Furthermore, another qualitative Indian case study by Ravichandran, Sujathamali & Gunasekaran (2022) established that assistive technology facilitates learning by reducing learning complexes. Thus, assistive technology enables students with visual impairment to access e-learning.

Although research has established that e-learning platforms can be beneficial for students with visual impairments in developed countries, other studies suggest that these platforms often remain inadequately inclusive. For instance, research by Permvattana, Armstrong & Murray (2013) in Australia found that most e-learning environments are designed primarily for sighted students, relying heavily on complex visual content and interactive features that are inaccessible to those with acute visual impairments. As a result, students with visual impairments must depend on assistive technologies to convert screen displays and documents into accessible formats. Similarly, Mahfuz et al. (2021) noted that while universities provided e-learning platforms, students with visual impairments were one excluded due to the lack of ICT tools compatible with assistive technologies required to access such platforms. In addition, a Canadian online learning study also highlighted significant challenges, including inaccessible websites and course management systems (CMS), limited access to digital audio and video content, and difficulties with PDF coursework and adaptive technologies. The current study aims to investigate whether the challenges faced by students with visual impairments in developed countries apply to the context of Zimbabwe. This research seeks to address the gap in understanding how these challenges manifest within the Zimbabwean educational system, particularly concerning the accessibility of e-learning platforms and ICT resources for students with visual impairments.

In Ethiopia and South Africa, the inaccessibility of e-learning platforms for students with visual impairments was caused by complex web designs, incompatible assistive technologies, and inaccessible document formats (Dabi & Golga,2023; Pitsoane & Matjila, 2021). These barriers have resulted in lost academic time and exclusion. Similarly, in Namibia and Eswatini, students with visual impairments reported limited access to e-learning platforms due to lecturers' lack familiarity with inclusive pedagogies and the unavailability of modern assistive technologies (Kasaira & Bwalya, 2020; Ferreira-Mayers, 2021; Otyola, Grace, & Muwagga,2017). In Zimbabwe, Zenda et al. (2024) observed that current educational practices indicate that many lecturers face significant challenges in effectively incorporating information and communication technology (ICT) into their teaching. This lack of technological proficiency, compounded by limited access to e-learning platforms and outdated ICT resources, impedes the meaningful engagement and learning of students with visual impairments. Consequently, universities should revise their policies to develop inclusive e-learning platforms that ensure equal access for students with visual impairments. Furthermore, research highlights that the unavailability of translators exacerbates the exclusion of students with visual impairments from participating fully in university e-learning activities. Therefore, this study aims to examine the experiences of students with visual impairments regarding their inclusion on university e-learning platforms.

METHODOLOGY

Ontological and epistemological perspectives

The study was rooted in the constructivist paradigm, which holds that reality is socially constructed and that people actively and continuously shape their subjective world through interactions with others (Cresswell, 2007). In this study, the researcher aimed to explore the realities of accessibility to e-learning platforms by engaging with university students with visual impairments and other key stakeholders, seeking to understand their perceptions and lived experiences. The constructed knowledge enabled the researcher to recommend how e-learning can be made accessible to students with visual impairment. Constructivists believe that language and narratives are expressions of power relations within a specific context, helping to investigate how an individual's experiences are shaped by their environment. Cresswell (2007) postulates that constructivists focus on the specific context in which people live and work to understand the historical settings of the participants.

Therefore, a qualitative approach informed the study, since the researcher interacted with participants to hear their voices and experiences concerning their inclusion in e-learning platforms during the post-COVID-19 pandemic. The qualitative approach allowed the researcher to explore the natural context of university students with visual impairments, university lecturers, and ICT personnel (Guba & Lincoln, 1994; Creswell, 2013). According to Creswell (2013), the up-close information gathered by talking directly to people and seeing them behave within their context is a significant characteristic of qualitative research. The research employed multiple sources of data, drawing on the perspectives of university students with visual impairments, the lecturers who taught them, and the ICT personnel responsible for managing the e-learning platforms. Furthermore, the study employed a case study design to explore the perspectives of students with visual impairments regarding their inclusion in e-learning platforms at a state university in Zimbabwe post COVID-19. Creswell (2007) argued that a case study design is effective when the researcher has identifiable cases with boundaries and seeks to provide an in-depth understanding of cases or a comparison of several cases. Setting boundaries was crucial in this study to maintain focus, uphold ethical standards, and protect both the researcher and the participants. A case study, by design, begins by identifying the case and establishing its boundaries, typically defined by time and place (Creswell, 2007).

Research context and setting

The study was conducted at a Zimbabwean state university with an estimated population of 20 students with visual impairments enrolled across different faculties. The university had approximately 200 lecturers and 20 ICT support staff. Out of the 200 lecturers, only 50 directly interacted with students with visual impairments in their respective modules. The ICT support staff was responsible for managing the university's e-learning platforms, including student portals, websites, and e-Kampus platforms, as well as, formatting and maintaining ICT hardware. The research took place between January 2023 and December 2023, covering the transition from online teaching to hybrid teaching following the COVID-19 pandemic.

Sampling strategy

A non-probability purposive and convenience sampling method was used to select participants. According to Patton (2001), criterion sampling is useful for identifying information-rich cases. The final sample included 15 participants:

- Five (5) students with visual impairments: The students were selected based on their total loss of sight and reliance on Braille and auditory senses for learning. They had experienced e-learning through Google Classroom for two semesters during and post-COVID-19, attending lectures, submitting assignments, and accessing examinations online.
- Five (5) lecturers: These individuals were chosen because they had experience teaching students with visual impairments using the e-learning platform. They were responsible for presenting lectures and seminars, assigning and grading tasks online, and providing feedback through digital platforms.
- Five (5) ICT administrators: These participants managed the university's G Suite and e-Kampus systems. Their responsibilities included developing training manuals, conducting training sessions for students and lecturers, and installing software to support e-learning accessibility.

Data collection methods

Multiple data collection methods were used to promote an in-depth understanding of participants' experiences. According to Cohen et al. (2018), using various data types is significant in case studies. Inherently, the researcher conducted structured telephone interviews with students who have visual impairments and were off-campus during the data collection phase. The researcher

and the assistant asked predetermined questions in a fixed order. All students with visual impairment were asked the same way ensuring consistency and comparability across responses. Therefore, the interview participants provided valuable insights into their experiences regarding e-learning accessibility; the challenges they face, expected support services; and recommendations. Structured open-ended questionnaires were administered to lecturers physically, taking into account their busy schedules.

The researcher arranged prior appointments with the lecturers and personally administered the questionnaires to ensure a 100% response rate. Lecturers were given one day to complete the questionnaire, after which the researcher collected the responses for analysis the following day. The open-ended questionnaire was designed to mirror the same structure as the interview guide used with university students with visual impairments, aiming to capture lecturers' perspectives on e-learning accessibility, the challenges encountered, the support services required, and their recommendations. In addition, structured face-to-face interviews were conducted with ICT administrators, similar to those conducted with students and lecturers. These interviews were explored the administrators' roles in supporting students with visual impairments, managing e-learning platforms, and addressing the challenges faced in the process.

DATA ANALYSIS

Data analysis was conducted using Braun & Clarke's (2006) thematic analysis framework, which allows for both deductive (top-down) and inductive (bottom-up) approaches. Thematic analysis is particularly valuable in case studies as it enables researchers to identify and interpret patterns within qualitative data providing a deeper understanding of the case's context and the experiences of the individuals involved (Beckles-Clarke & Joseph-Edwards, 2023; Braun & Clarke, 2022;). Thus, thematic analysis was integral to the current case study, as it enabled the researcher to systematically identify and interpret recurring themes within qualitative data, providing deeper insights into the subject under investigation (Braun & Clarke, 2006; Dawidi, 2020).

The researcher employed a deductive (top-down) approach. Guest, McQueen & Namey (2012) explain that deductive thematic analysis begins with predefined themes or theoretical frameworks, with researchers actively seeking evidence that aligns with these predetermined themes. This method enabled the identification and in-depth analysis of recurring patterns and themes, contributing to a more nuanced interpretation of participants' experiences. Accordingly, the researcher analysed the data through the lens of established theoretical frameworks, emphasising equity and quality inclusion in e-learning platforms for students with visual impairments; and a comprehensive review of related literature, ensuring a systematic and rigorous interpretation of the findings.

The telephone and face-to-face interviews were recorded and transcribed verbatim to ensure the precise capture of participants' words, as these may carry significant meaning. According to Patton (2015), verbatim transcription enhances transparency and enables the researcher to provide direct evidence. The data analysis began with a thorough review of the transcribed interviews and participants' responses from open-ended questionnaires. Guided by the research questions, theoretical framework, and existing literature, the researcher identified a set of pre-existing themes. These themes were later refined to align with emerging patterns, with each theme systematically linked to relevant excerpts and the theoretical framework.

Ethical considerations

Ethical guidelines were strictly followed throughout the study. Participants were provided with a clear and concise explanation of the study's purpose, and they voluntarily consented to participate. To ensure confidentiality, data were anonymised using coded identifiers (e.g., STV1 for students

with visual impairments, LECT1 for lecturers, and ITCP1 for ICT personnel), thereby protecting participants' identities and affiliations. Interviews with students with visual impairments were recorded in audio format, and research assistants were trained in inclusive communication techniques to uphold data protection. Additionally, students were informed about the availability of a disability support centre at the university for further assistance in case of distress.

FINDINGS

The findings underscore the considerable challenges experienced by students with visual impairments in achieving meaningful inclusion within university e-learning platforms. These challenges point to systemic barriers that hinder full participation and access, highlighting the need for greater accommodations and awareness in digital learning environments. According to interviews with students, including students with visual impairments in e-learning was largely unsuccessful, as the university platforms were not designed to accommodate their needs. Many students reported being unable to access their student portals, and in some cases, lecturers were unaware of their presence in the classes. As a result, no modifications were made to the e-learning platforms to ensure their inclusion. The following quotes provide further insight into these challenges.

“The university e-learning is not accessible to us because sometimes I will be out in the rural area, and my screen reader is not functional.” (STV1)

“We even fail to access the portals independently.” (STV5)

“Some lecturers do not even know we students with visual impairment exist; hence, no modifications are made on the e-learning platform.” (STV2)

In concurrence with students with visual impairment, lecturers revealed that the university did not inform them about students with visual impairment in classes. So, they planned their lectures without considering students with visual impairment; hence, no modifications were made, resulting in excluding students from the university e-learning platforms. Lecturers only discovered the presence of students with visual impairment when they failed to submit assignments timeously and then they knew it resulted from visual impairment. Below are some of the sentiments shared by the participants:

“We are usually not told about the presence of students with visual impairment in our classes.” (LECT 2)

“We usually do not plan for them because we do not know about their existence. Guess excluding them.” (LECT 4)

“We then try to find out why students are not responding timeously. We then discover it because they have a visual impairment.” (LECT 3)

Interviewed ICT personnel expressed concern regarding the lack of available data on students with visual impairments, which further intensifies efforts to address their specific needs within the e-learning environment. They faced challenges in including students' visual impairment in their e-learning platforms. For example, they indicated that the e-learning training manuals excluded students with visual impairment because they were not presented in braille formats. They also revealed that during e-learning training, they physically trained the lecturing staff and training manuals to students in print format, excluding students with visual impairment. This resulted in students with visual impairment failing to submit assignments on time because the platforms were inaccessible. The following verbal quotes support the above findings;

"We are unaware of their presence because we were not given their statistics; hence, it is difficult to make modifications to include them on e-learning platforms." (ICTP5)

"During the production of e-compass training manuals, students with visual impairment were not in the picture. Hence, there is no provision for braille." (ICTP 4)

"Some lecturers complain about students with visual impairment failing to submit the assignments online because of lack of accessibility to e-learning platforms." (ICTP4)

Perceived student support in place for students with visual impairment to be successfully included in the university e-learning platforms

The students with visual impairment revealed that there was minimal support that facilitated their successful inclusion in university e-learning platforms as they struggled to find assistive technology. Furthermore, they were not taught ICT skills to access e-learning platforms. They also revealed that even the physical libraries did not have assistive technology like computers with NVDA, screen readers, and Jaws software to access these platforms. The following sentiments confirm the above findings:

"The University does not have assistive technologies. We find our own to help us access e-learning platforms." (STV5)

"We were not taught ICT skills that would assist us as students with visual impairments." (STV4)

"Even the libraries do not have computers with screen readers for us to access the e-learning platform." (STV2)

In line with university students with visual impairment, lecturers agreed that the university did not have gadgets with screen readers and Jaws software. However, special needs and inclusive education lecturers revealed that they had a few computers in the department with NDVA screen readers. Still, only some students with visual impairments were aware of these services. These were not extended to other university centres. Below is what other interviewed lecturers said;

"I have not heard of a scenario where students with visual disabilities were given assistive technology for use by the university." (LECT 5)

"I have not seen computers in the library with such application software." (LECT 5)

However, some of the lecturers in the Department of Special Needs and Inclusive Education department had this to say;

"We have computers installed with the jaws and NVDA software in the department. Students are supposed to be using these for research and examinations." (LECT 1)

"The assistive technology in this department is not accessible to all students with visual impairment at the university." (LECT 3)

Like the students with visual impairments and lecturers, the ITC personnel agreed that the university had limited assistive technologies for students with visual impairments to be included in e-learning platforms. However, they also knew that the Department of Special Needs and Inclusive Education had computers with screen readers and other visual disability user-friendly software. The ICT personnel were unsure if they were available to all students with VI at the University. The following verbal quotes support the findings above:

"The university does not have enough assistive technology for students with visual impairment." (ICTP 5)

"The department received some computers, and we installed them with the NDVA software." (ICTP 2)

"Whether the machines are accessible to all students with visual impairment at the moment, we are unsure." (ICTP 4)

Possible solutions to the inclusion of students with visual impairment in the university e-learning platforms

Students with visual impairment revealed a need for the lecturers to know about their existence before lecturing on e-learning platforms. This could be done by maintaining a university database for students with visual impairment so that lecturers can design inclusive pedagogy for students with visual impairment. University Students with visual impairment also revealed the need for the university to loan them assistive technology for use on e-learning platforms. They also suggested that e-learning training manuals be presented in braille format so that they can follow the instructions even though they will use screen readers. Following are the sentiments shared confirming the above findings:

"Lecturers should know about our existence before preparing for online lectures so that necessary modifications are made." (STV 3)

"The university should have a database of all students with visual impairment so that they can budget and provide assistive technology." (STV 5)

"The University can loan us the assistive technologies or laptops with screen readers for use when we are away from the compass." (STV 2)

Interviewed lectures agreed with the students with visual impairment that the university should maintain a database for students with visual impairment so that they do not just accidentally see them in lectures without knowing about their existence before lessons. The lecturers indicated that the e-learning training workshops for lecturers should also be extended to students with visual impairments in all the schools or faculties. In agreement with the students, the lecturers revealed that the e-learning training manuals should also be provided in braille format for easy accessibility by students with visual impairment. The following verbal quotes confirm the findings above.

"The university should have statistics of students with visual impairment, and this should be given to us as soon as we are allocated modules for teaching." (LECT5)

"e-compass learning platforms workshops done to lecturers should also be extended to students with visual impairment." (LECT 4)

"The training manuals sent to students' platforms could also be produced in tangible braille for easy accessibility by students with visual impairment." (LECT 5)

DISCUSSION

Lack of accessibility

The study found that university students with visual impairments perceived their inclusion in e-learning platforms because the online university platforms needed to be tailored to meet the needs of students with visual impairment. This could have resulted from e-learning platforms inadequately designed to accommodate students with visual impairments, for example, incompatibility with screen readers, poor navigation structures, and lack of alternative text to images and videos. The above results concur with the previous study, where Brazilian students with visual impairments

indicated they were not included in online computing programmes (Luque et al., 2018). The exclusion of students with visual impairment hurts students' self-efficacy in reaching their optimal level of education. When online learning platforms fail to accommodate students with visual impairments, these students may experience exclusion, potentially hindering their educational progress and overall learning experience.

It was also established that the students with visual impairment needed to be trained in accessing the e-learning platforms, as it emerged that the training manuals available were not provided in braille. The findings above confirm the recent studies at Makerere University, Eswatini, and Bangladesh (Roberts et al., 2017; Ferreira-Mayers, 2021; Mahfuz, 2022). Failure to provide training manuals in other formats violates the right of students with visual impairment to quality and equitable education. Additional support such as technical assistance and alternative modes of communication could help students with visual impairment navigate e-learning platforms.

Lack of statistical data

The study established that the university lacked statistical data on students with disabilities at the university. Statistics on students with disabilities help the university work towards equity and quality education (Eligi & Mwantina, 2017). A lack of reliable statistical data can also hamper the provision of assistive technologies for students with visual impairments. The findings highlight a significant gap in the university's ability to support students with disabilities, particularly those with visual impairments. In the absence of statistical data, universities may struggle to allocate resources effectively. This may include budgeting for assistive technology, hiring support staff, and developing accessible e-learning platforms. Eligi & Mwanta (2017) argued that statistical data is crucial for promoting equity and quality education.

Support services

The study showed that university students with visual impairments got minimal support from the university to participate in e-learning platforms. Students with visual impairments indicated they did not access assistive technology like computers with jaws or NDVA screen reader software at the university. Without this kind of technology, students with visual impairments may experience limitations in their participation in e-learning platforms. Related findings were noted in Ghana (Amponsah & Belele, 2022). Thus, the limitations in providing assistive technologies to students with visual impairment in Zimbabwe are tantamount to excluding them from e-learning platforms. The study also revealed significant limitations of assistive technology accessibility for university students with visual impairments. It emerged that the few available computers equipped with screen readers and JAWS software were confined to the Department of Special Needs and the Inclusive Education Centre, and were largely unknown to most students with visual impairments across the university. These findings align with a previous study in Ethiopia by Dabi & Golga (2022), which similarly found that students with visual impairments lacked awareness of existing assistive technologies. The shortage of accessible computers significantly hinders the inclusion of students with disabilities, often resulting in stress and frustration during online learning activities. The absence of essential screen reader software further prevents full engagement in online learning environments – a finding echoed by Amponsah & Bele (2022). These challenges may not be unique to Zimbabwean higher education but could reflect broader issues across other African countries. Thus, universities should prioritize the procurement and installation of screen reader software such as JAWS, NDVA, and other assistive technologies on computers in libraries and computer laboratories to promote inclusive access.

Possible solutions

Although the experiences of students with visual impairments revealed inaccessibility to e-learning platforms, the study also established the need for lecturers to know about the existence of students

with visual impairments before the commencement of the online instruction. This awareness would enable lecturers to modify their teaching strategies and course materials to accommodate these students effectively. Similar solutions have been recommended in studies conducted in Malaysia and South Africa (Mahfuz et al., 2021; Cassels & Weber, 2017). Knowledge of students' specific needs from the outset is essential for creating inclusive e-learning environments, thereby supporting the successful participation of students with visual impairments.

In addition, students with visual impairments suggested that the university loaned them assistive technology for use during e-learning platforms. The above provision of assistive technology by the universities would enable students with visual impairment to complete learning tasks in a timely manner (Pacheco et al., 2017). In addition, Eligi & Mwantimwa (2017) postulated that the necessity for students with visual impairment to have assistive technology engenders practical accessibility in e-learning platforms.

The students with visual impairments suggested that the e-learning training manual be presented in braille format for easy access visually impaired students. The above recommendation aligns with the Convention on the Rights of Persons with Disabilities (2006) Article 9, which mandates that member states ensure that the education of a person with visual impairment is delivered in the most appropriate mode and means of communication for the individual (UNCRDP, 2006). The absence of didactic materials printed in Braille hinders the ability of students with visual impairments to acquire knowledge through reading (Duart et al., 2020). Providing training manuals in braille format would significantly enhance the accessibility of e-learning platforms for students with visual impairments.

The study showed that the ICT staff to be trained in application software designed to support students with visual impairments. The above requests were also made in South Africa and Mumbai, where it was recommended that the ICT staff employed at the computer labs be trained in using and providing support to students with visual impairment on specialised computer programs like Jaws and NVDA (Kharande & Peese, 2012; Pistoane & Matjila, 2021). According to Armstrong (2009), Information and technology help desks and network administration are ideal for students with visual impairment.

CONCLUSION AND RECOMMENDATIONS

The study concluded that e-learning platforms at this university were not adequately accessible to students with visual impairments, primarily due to the inaccessibility of both the e-learning platforms themselves and the instructional practices of the lecturers. The study concluded that an accessible e-learning platform could serve as a viable solution for promoting equity and quality education for students with visual impairments, provided the university supplies appropriate assistive devices and application software compatible with the needs. Additionally, it is imperative that lecturers and staff receive training in inclusive pedagogy and the effective use of e-learning platforms to ensure meaningful participation for all students.

The study recommends that universities come up with specific disability policies on the provision of assistive technologies and software; for easy accessibility on e-learning platforms by students with visual impairments; and provide funding for the assistive technology for e-learning technology to enhance accessibility by students with visual impairment to e-learning platforms.

Limitations

The study was limited by its use of a small, purposive sampling method, which was judgmental. As a result, the findings may not be fully generalisable to the experiences of all students with visual impairments across the university, thus limiting the ability to assess the overall inclusivity of students across different universities. Additionally, the research may have overlooked other ICT

support services available to students with visual impairments at various universities, which could have provided valuable insights.

Future work

The study recommends the implementation of a large-scale survey into the use of assistive technology for students with visual impairments across all universities in Zimbabwe. This would help to evaluate the extent of their full inclusion in e-learning platforms and identify areas for improvement in accessibility and support.

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