

Teachers' Perceptions of the Use of Assistive Technology in Influencing the Academic Performance of Learners with Visual Impairment in Computer Studies in Lusaka District, Zambia

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ABSTRACT

The integration of assistive technology (AT) in education has emerged as a critical factor in promoting inclusive learning for learners with visual impairment. This study explored teachers' perceptions of how AT influences the academic performance of learners with visual impairment in Computer Studies in Lusaka District, Zambia. The study was guided by three objectives: to explore how teachers perceive the influence of AT on academic performance, to establish how teachers experience challenges of integrating AT, and to suggest measures for improving effective AT use. Employing a phenomenological research design, the study purposively sampled twelve Computer Studies teachers from four mainstream secondary schools in Lusaka District. Data were collected through semi-structured interviews and classroom observations. The findings revealed that teachers perceive AT as having a positive influence on academic performance, particularly in enhancing learners' independent participation and confidence. However, teachers experienced significant challenges including inadequate AT devices, lack of training, technical malfunctions, and infrastructural limitations such as unreliable electricity. Suggested measures included regular teacher training, provision of adequate AT resources, establishment of maintenance systems, and policy reinforcement. The study concludes that while teachers hold positive perceptions regarding AT's potential, systemic barriers severely limit its effective implementation. Recommendations include that the Ministry of Education should mandate comprehensive AT training in teacher education programmes, schools should establish functional AT maintenance and support systems, and policymakers should allocate dedicated funding for AT resources in mainstream schools.

Keywords: Assistive technology, teachers' perceptions, visual impairment, Computer Studies, inclusive education

INTRODUCTION

Globally, the rights of learners with disabilities to access quality education have been increasingly recognized through various international frameworks. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006) asserts that all persons with disabilities, including those with visual impairment, have the right to inclusive education systems that accommodate their diverse learning needs. Furthermore, the Sustainable Development Goal 4 (SDG 4) emphasizes inclusive and equitable quality education for all, highlighting the importance of accessible learning environments. According to the World Health Organisation (WHO, 2019), approximately 253 million people live with visual impairment globally, with a significant proportion being school-aged children. Researchers such as Bahati (2023) argue that assistive technology plays a transformative role in enabling learners with visual impairment to access the curriculum on an equal basis with their sighted peers. Moreover, studies conducted in developed countries demonstrate that when appropriately implemented, AT tools such as screen readers, braille embossers, and magnification software significantly enhance academic outcomes for learners with visual impairment in technology-related subjects (Kelly & Smith, 2020). However, despite these global advancements, the integration of AT in educational settings remains uneven across different regions of the world.

In Africa, the situation regarding AT integration remains challenging, though progress has been noted in some countries. Juma and Ntulo (2024) observe that several African nations have adopted inclusive education policies, yet implementation of AT remains minimal due to resource constraints and limited technical expertise. Additionally, researchers contend that in countries such as Kenya, South Africa, and Tanzania, learners with visual impairment continue to face significant barriers in accessing computer studies due to inadequate AT infrastructure (Mwaura & Omondi, 2022). For instance, Nkosi and Dlamini (2021) highlight that while South Africa has made strides in developing AT policies, mainstream schools still lack appropriate devices, and teachers receive insufficient training on their use. Similarly, a study by Ogunleye and Adebayo (2020) in Nigeria reveals that teachers perceive AT as beneficial but report being ill-equipped to integrate it effectively into their computer studies lessons. These studies point to a persistent gap between policy aspirations and classroom realities across the African continent.

In Zambia, the government has demonstrated commitment to inclusive education through various policy frameworks. The *Zambian Education Policy* of 1996, revised in 2011, explicitly advocates for the inclusion of learners with special educational needs in mainstream schools. Furthermore, the *National Policy on Inclusive Education* (2015) states that all learners, regardless of disability, should have access to appropriate learning resources, including assistive technologies. Kandimba, Mandyata, and Simalalo (2023) observe that while Zambian policies promote inclusivity, teachers often lack a nuanced understanding of how to implement these policies practically in classroom settings. Despite these policy commitments, research suggests that implementation remains limited. Kaulu (2019) investigated AT use at a specialised institution for learners with visual impairment and found that even in that context, resources were inadequate and teacher training insufficient. More recently, Kandimba, Kalimaposo, Mandyata, Bwalya, Kabwe, & Kalunga (2025b) contend that increasing accessibility to inclusive education for learners with disabilities in Zambian primary schools requires not only policy reinforcement but also substantial investment in resources and teacher capacity building. However, there exists a significant research gap concerning AT integration in mainstream primary and secondary schools, particularly in Lusaka District. This study therefore seeks to contribute to this under-researched area by specifically examining teachers' perceptions regarding the influence of AT on academic performance of learners with visual impairment in Computer Studies.

Statement of the Problem

In an ideal situation, Zambian policies such as the *National Policy on Inclusive Education* (2015) and international frameworks (UNCRPD, 2006) envision learners with visual impairment having equal access to quality education through suitable assistive technology (AT), including screen readers, magnification devices, and braille embossers. Teachers would receive comprehensive AT training, maintenance systems would ensure functionality, and resources would address learner needs. Kandimba, Kalimaposo, Mandyata, Bwalya, Kabwe, & Kalunga (2025a) assert that effective pedagogical approaches depend on teachers being adequately equipped with both resources and training.

In reality, actual conditions in Zambian mainstream secondary schools starkly diverge. Learners face substantial obstacles due to insufficient AT equipment. Where devices exist, they remain underutilised because of inadequate teacher training, recurrent malfunctions, low educator awareness, and infrastructural limitations (intermittent electricity and internet). Many schools lack appropriate AT or rely on obsolete equipment. Kandimba et al. (2023) highlight that Zambian teachers demonstrate limited understanding of adapting curricula for diverse learner needs, a gap extending to AT integration. Maintenance systems are non-existent or inadequate.

The consequences of this are that learners with visual impairment experience decreased academic achievement in Computer Studies, limited engagement in practical activities, social alienation, and diminished long-term prospects. Without suitable AT, they cannot access digital content, complete tasks, or participate fully in technology-driven learning. This sustains educational inequity and violates their right to quality education. Bwalya et al. (2026) argue that without appropriate tools, learners with disabilities are systematically excluded from meaningful participation. Although research exists on AT for learners with visual impairment in other African contexts (Bahati, 2023; Juma, Ntulo, 2024; Bwalya, Mwamba & Kandimba, 2026) and at Zambian specialised institutions (Kaulu, 2019), a significant gap exists in studies focusing explicitly on mainstream

secondary schools in Lusaka District concerning Computer Studies. Teachers' perceptions have not been systematically documented. This study was prompted to investigate teachers' perceptions of AT influence on academic performance, challenges experienced during AT integration, and measures for improving effective AT use. The study was guided by the following research objectives:

1. To explore how teachers perceive the influence of assistive technology on the academic performance of learners with visual impairment in Computer Studies in Lusaka District.
2. To establish how teachers experience the challenges of integrating assistive technology to support learners with visual impairment in Computer Studies lessons in Lusaka District.
3. To suggest measures aimed at improving the effective use of assistive technology to enhance the academic performance of learners with visual impairment in Computer Studies in Lusaka District.

THEORETICAL FRAMEWORK

This study is anchored on two complementary theoretical frameworks: Davis's (1989) Technology Acceptance Model (TAM) and Bronfenbrenner's (1979) Ecological Systems Theory. The Technology Acceptance Model posits that an individual's acceptance and use of technology is primarily determined by two key constructs: perceived usefulness and perceived ease of use. According to Davis (1989), perceived usefulness refers to the degree to which a person believes that using a particular technology would enhance their job performance, while perceived ease of use refers to the degree to which a person believes that using the technology would be free of effort. In the context of this study, TAM provides a lens for understanding how teachers' perceptions of AT's usefulness and ease of use influence their willingness to integrate these technologies when teaching Computer Studies to learners with visual impairment. Furthermore, Venkatesh and Bala (2008) contend that external factors such as training, technical support, and organisational context shape these perceptions. This framework is therefore appropriate for examining the subjective perceptions of teachers, which are the central focus of this study.

Complementing TAM, Bronfenbrenner's (1979) Ecological Systems Theory asserts that human development and behaviour are influenced by multiple interconnected systems, including the microsystem (immediate environment such as the classroom), mesosystem (interactions between microsystems), exosystem (indirect influences such as school policies), and macrosystem (broader cultural and policy context). Researchers such as Sider and Maich (2014) argue that this ecological perspective is valuable for understanding the integration of AT for learners with disabilities, as it recognises that successful implementation depends not only on teacher attitudes but also on systemic factors including institutional support, policy frameworks, and community resources. Kandimba et al. (2025a) similarly assert that pedagogical approaches for learners with disabilities must be understood within the broader ecological context of school resources, administrative support, and policy implementation. In this study, the ecological systems theory helps to situate teachers' perceptions and challenges within the broader context of school infrastructure, district-level support, national policies, and cultural attitudes towards disability and technology. By combining TAM and Ecological Systems Theory, this study adopts a comprehensive analytical framework that accounts for both individual teacher perceptions (micro-level) and systemic environmental factors (macro-level) that influence AT integration for learners with visual impairment in Computer Studies.

LITERATURE REVIEW

The review of literature is organized thematically according to the research objectives, covering: the nature of Assistive Technology available, teachers' perceptions of the influence of AT on academic performance, teacher experiences of challenges in integrating AT, measures for improving effective use of AT and the gaps identified in the literature.

Conceptual Explanation of Assistive Technology

Assistive technology refers to any device, equipment, software, or product system that is used to maintain, increase, or improve the functional capabilities of individuals with disabilities. According to the Individuals with Disabilities Education Act (IDEA, 2004), AT encompasses both low-technology devices such as magnifying glasses and high-technology solutions such as screen reading software. Cook and Polgar (2015) contend that AT serves as a bridge that enables learners with disabilities to access educational content that would otherwise be inaccessible. Specifically for learners with visual impairment, AT includes screen readers (JAWS, NVDA, Voice Over), magnification software (ZoomText), braille displays, braille embossers, optical character recognition (OCR) scanners, and refreshable braille note-takers. Researchers such as Presley and D'Andrea (2009) assert that the effective use of AT in computer studies enables learners with visual impairment to engage in coding, word processing, internet browsing, and other digital literacy activities independently. Therefore, understanding teachers' perceptions of these AT tools is essential for promoting inclusive computer education.

Teachers' Perceptions of the Influence of AT on Academic Performance

Globally, research indicates that teachers generally hold positive perceptions regarding the potential of assistive technology (AT) to enhance the academic performance of learners with visual impairment. Kelly and Smith (2020) conducted a study in the United States and found that 87% of computer studies teachers perceived AT as having a significant positive influence on learners' academic outcomes, particularly in tasks requiring independent navigation of digital interfaces. However, this study was conducted in a high-income country with well-established technology infrastructure and consistent access to AT devices. In contrast, the present study focuses on Lusaka District, Zambia, where schools face resource constraints, unreliable electricity, and limited internet connectivity. Furthermore, Kelly and Smith (2020) examined general computer studies outcomes without specifically addressing the unique challenges of mainstream secondary schools in low-resource African contexts. Therefore, the present study addresses this gap by exploring whether similarly positive perceptions exist among Zambian teachers despite systemic barriers.

Furthermore, researchers such as Zhou and Smith (2021) argue that teachers who receive adequate AT training demonstrate more positive perceptions and are more likely to integrate AT effectively into their instruction. However, the study by Zhou and Smith (2021) was conducted in contexts where pre-service and in-service teacher training programmes routinely include AT modules. In Zambia, however, teacher education programmes rarely include any AT training, as evidenced by Kandimba et al. (2023). Therefore, the gap this study addresses is the lack of understanding of how teachers form perceptions of AT in the absence of any formal training. Unlike Zhou and Smith's (2021) context of adequate training, this study examines teacher perceptions in a context where training is virtually non-existent, providing a unique perspective on how teachers develop attitudes towards AT without structured preparation.

In Europe, studies by Böhm and Griffiths (2022) highlight that teachers perceive screen reader technology as enabling learners with visual impairment to achieve comparable coding competencies to their sighted peers. Nonetheless, the European study assumed consistent access to up-to-date screen reader software, functional computers, and reliable technical support. In Zambia, mainstream secondary schools often lack even basic screen reader licenses, and where available, devices are frequently outdated or malfunctioning. Moreover, Böhm and Griffiths (2022) focused on coding competencies specifically, whereas Computer Studies in Zambian secondary schools encompasses a broader curriculum including word processing, spreadsheets, and file management. This study therefore addresses the gap by investigating teacher perceptions of AT influence across the full Computer Studies curriculum in a resource-constrained Zambian context, where learners do not have consistent access to functioning AT.

In Africa, studies on teacher perceptions of AT influence have produced mixed findings. Bahati (2023) conducted research in Tanzania and observes that teachers in urban mainstream schools perceive AT as beneficial for improving learners' confidence, access to digital content, and completion of computer-based assessments. However, Bahati's (2023) study focused on general AT use across multiple subjects and did not specifically examine Computer Studies as a discrete subject area. Furthermore, Tanzania and Zambia, while both East African nations, have different education policies, teacher training curricula, and AT procurement systems.

The present study addresses this gap by focusing specifically on Computer Studies teachers in Lusaka District, Zambia, thereby providing subject-specific insights that Bahati's (2023) broader study could not capture.

Juma and Ntulo (2024) contend that despite these positive perceptions, actual influence on academic performance remains limited due to inconsistent access to functioning AT devices. Although Juma and Ntulo (2024) conducted their research across multiple East African countries, they did not include Zambia in their sample. Their findings regarding inconsistent access to AT devices are based on data from Kenya, Uganda, and Tanzania. Therefore, a gap exists in understanding whether Zambian Computer Studies teachers experience similar levels of inconsistency in AT access, and how this specifically affects learners' academic performance in computing tasks. The present study fills this gap by providing empirical evidence from the Zambian context.

In Kenya, Mwaura and Omondi (2022) found that teachers perceived AT as having a moderate influence on academic performance, but noted that learners often struggled to transfer skills learned on one type of device to another due to lack of standardization. Although the Kenyan study examined AT use across various subjects but did not specifically focus on Computer Studies, which requires unique skill transfer between different software applications and hardware devices. Moreover, Kenya has a more developed technology sector and AT infrastructure compared to Zambia. The present study addresses this gap by investigating whether Zambian Computer Studies teachers observe similar skill transfer challenges, and how the lack of device standardisation in resource-constrained Zambian schools specifically impacts learners' ability to develop practical computing competencies.

Additionally, Ogunleye and Adebayo (2020) in Nigeria assert that teachers perceive AT as most influential when learners receive consistent access to the same technology throughout their computer studies course. Nevertheless, Ogunleye and Adebayo's (2020) study was conducted in private Nigerian schools that had relatively better access to AT resources compared to public schools. In contrast, public mainstream secondary schools in Lusaka District, Zambia, face more severe resource constraints. Furthermore, their study did not examine the specific challenges of maintaining consistent AT access in contexts of load shedding, intermittent internet, and lack of technical support. Therefore, the present study addresses this gap by investigating how Zambian teachers perceive the influence of AT under conditions of highly inconsistent access, which differs significantly from the Nigerian context.

In Zambia, limited research exists on this specific topic. Kaulu (2019) investigated AT use at a specialised institution for learners with visual impairment and found that teachers perceived AT as having a positive but underutilised influence on academic performance. However, this study did not focus on Computer Studies specifically nor on mainstream school contexts. Nonetheless, Kaulu (2019) conducted research at a specialised institution that receives dedicated funding, trained specialists, and resources specifically for learners with visual impairment. Mainstream secondary schools in Lusaka District, however, lack these advantages and are expected to include learners with visual impairment without equivalent resources (Kaluta & Kandimba, 2026). Therefore, a critical gap exists in understanding whether teachers in mainstream schools perceive AT similarly to their counterparts in specialised institutions. The present study fills this gap by focusing specifically on mainstream school contexts in Lusaka District.

Kandimba et al. (2023) observe that Zambian teachers' understanding of how to support learners with disabilities is often limited by lack of exposure to appropriate pedagogical strategies, which likely extends to the use of AT in Computer Studies. Nevertheless, Kandimba et al. (2023) focused on curriculum adaptation for learners with moderate intellectual disabilities, not visual impairment. Furthermore, their study did not address Computer Studies or assistive technology. Therefore, a gap exists in understanding how the lack of pedagogical exposure specifically affects Computer Studies teachers who need to integrate AT for learners with visual impairment. The present study addresses this gap by examining Computer Studies teachers' specific pedagogical challenges related to AT integration, which may differ significantly from those faced by teachers of learners with intellectual disabilities.

Furthermore, Bwalya et al. (2026) contend that even when policies and tools exist, teachers may struggle with

implementation if they have not received adequate training on specific instructional mediums. However, Bwalya et al. (2026) focused on sign language as a medium of instruction for learners with hearing impairments, a communication-based accommodation rather than a technology-based one. Their findings about training inadequacy may not directly translate to AT for visual impairment, which requires technical skills (software installation, keyboard shortcuts, troubleshooting) rather than language skills. Therefore, a gap exists in understanding how lack of AT-specific training affects Computer Studies teachers, who require both pedagogical and technical competencies. The present study fills this gap by examining training needs specific to AT integration in Computer Studies.

Teacher Experiences of Challenges in Integrating AT

Globally, researchers have documented numerous challenges that teachers experience when integrating AT for learners with visual impairment. Kelly and Smith (2020) identify inadequate teacher training as the most frequently reported challenge, with many teachers stating they received no pre-service training on AT whatsoever. Nevertheless, this global finding is based on data from the United States, where teacher training programmes are well-established and technology infrastructure is robust. The gap for the present study is that no research has documented whether Zambian Computer Studies teachers experience the same complete absence of pre-service AT training, and if so, how this absence specifically manifests in their classroom challenges. Unlike the US context where AT training is available but not mandatory, Zambia may have no AT training content whatsoever in teacher education curricula.

Furthermore, Zhou and Smith (2021) highlight that even when teachers receive training, it is often theoretical rather than hands-on, leaving them unprepared to troubleshoot technical issues. Nonetheless, Zhou and Smith (2021) conducted their research in well-resourced educational systems where theoretical training is provided but practical application is lacking. In Zambia, the gap is even more pronounced because many teachers receive no training at all, not even theoretical. Therefore, the present study addresses the gap of understanding how Zambian teachers, who likely have received zero formal AT training, experience challenges compared to teachers who have received at least theoretical training in other contexts.

In Australia, researchers such as Anderson and Henderson (2018) contend that teachers experience challenges related to insufficient technical support, with schools lacking dedicated AT specialists who can assist when devices malfunction. Australia has a well-developed education system with established pathways for specialist support. The gap in relation to the present study is that Zambian schools may lack not only AT specialists but also any form of technical support, including basic computer technicians who understand accessibility features. Furthermore, Anderson and Henderson (2018) did not examine contexts with additional challenges such as load shedding, lack of spare parts, and no service agreements, which are realities in Lusaka District.

Additionally, Booth and Jones (2019) observe that teachers face challenges in adapting computer studies curricula to accommodate AT, as curriculum materials are rarely designed with accessibility features in mind from the outset. Nevertheless, Booth and Jones (2019) studied curriculum adaptation in the United Kingdom, where the national curriculum includes accessibility guidelines. In Zambia, the Computer Studies curriculum was developed without specific consideration of AT for learners with visual impairment. Therefore, a gap exists in understanding how Zambian teachers adapt a curriculum that was never designed to be accessible. The present study addresses this gap by examining the specific curriculum adaptation challenges faced by Computer Studies teachers in Lusaka District's mainstream schools.

In Africa, challenges are more acute due to resource constraints and infrastructural limitations. Bahati (2023) found that teachers in Tanzania experience shortages of AT devices, with student-to-device ratios as high as 15:1 for screen reader licenses. While Bahati's (2023) Tanzanian study is geographically relevant, it did not focus on Computer Studies specifically. Computer Studies requires more frequent and sustained access to AT devices compared to other subjects because of the practical, hands-on nature of computing skills. The present study addresses this gap by examining whether student-to-device ratios in Lusaka District are similar to or worse than Tanzania, and how these ratios specifically impact Computer Studies learning outcomes.

Nkosi and Dlamini (2021) in South Africa argue that even where devices are available, teachers experience challenges with unreliable electricity supply that disrupts computer use during lessons. South Africa, while facing load shedding, has more developed infrastructure and alternative power solutions compared to Zambia. Furthermore, Nkosi and Dlamini's (2021) study did not quantify how electricity disruptions specifically affect learners with visual impairment who rely on powered AT devices. The present study addresses this gap by documenting Zambian teachers' experiences with load shedding and its specific impact on Computer Studies lessons involving AT for learners with visual impairment.

Furthermore, Juma and Ntulo (2024) observe that teachers experience psychological challenges including frustration and low self-efficacy when repeatedly unable to make AT function properly due to lack of technical knowledge. Even though Juma and Ntulo (2024) identified psychological challenges, they did not specifically examine Computer Studies teachers, who face additional pressure because computer malfunctions directly prevent practical skill development. The present study fills this gap by exploring the psychological and emotional experiences of Computer Studies teachers in Lusaka who must teach practical computing skills without functioning AT.

Ogunleye and Adebayo (2020) in Nigeria highlight that teachers experience challenges with outdated software that is incompatible with modern operating systems, rendering expensive AT devices unusable. However, Ogunleye and Adebayo (2020) focused on private schools in Nigeria that had access to relatively modern hardware. In Lusaka District's public mainstream schools, computers are often donated, second-hand, or very old, running outdated operating systems. Therefore, a gap exists in understanding how Zambian teachers experience the intersection of outdated AT software and outdated hardware, which may create compatibility challenges not documented in the Nigerian study. The present study addresses this unique Zambian context.

In Zambia, research on teacher experiences of AT integration challenges is gradually emerging. Kaluta and Kandimba (2026) noted that teachers at a specialised institution experienced challenges including lack of spare parts for braille embossers and insufficient training on screen reader software. Nonetheless, Kaluta and Kandimba's (2019) study was conducted at a specialised institution that has access to AT resources not available in mainstream schools. Furthermore, the study did not focus on Computer Studies. Therefore, a gap exists in understanding whether mainstream Computer Studies teachers in Lusaka District experience similar or more severe challenges, given that they lack the specialist support structure of a dedicated institution for learners with visual impairment.

Kandimba et al. (2025a) explored pedagogical approaches used by teachers for learners with disabilities in Luanshya District and found that teachers experience significant challenges related to insufficient resources, large class sizes, and lack of specialised training. The authors contend that these challenges are not unique to intellectual disabilities but extend across disability categories, including visual impairment. However, Kandimba et al. (2025a) focused on learners with intellectual disabilities and did not specifically examine AT or Computer Studies. Learners with visual impairment require different pedagogical approaches and resources (AT devices, screen readers) compared to learners with intellectual disabilities. Therefore, a gap exists in understanding whether the challenges documented for intellectual disabilities such as resource shortages, large class sizes and lack of training, manifest differently for Computer Studies teachers supporting learners with visual impairment. The present study addresses this gap by focusing specifically on visual impairment and AT in Computer Studies.

Similarly, Kandimba et al. (2025b) argue that increasing accessibility to inclusive education in Zambian primary schools requires addressing systemic barriers including inadequate teacher preparation and resource scarcity. Similarly, Kandimba et al. (2025b) focused on primary schools and general accessibility, not secondary education or Computer Studies. Secondary Computer Studies has unique practical requirements not present in primary education. Furthermore, the study did not address AT specifically. The present study therefore fills the gap by examining secondary school Computer Studies teachers' experiences with AT, an area not covered by Kandimba et al. (2025b).

However, Mwape and Banda (2020) contend that mainstream school teachers likely experience even greater challenges due to larger class sizes, lack of specialist support, and fewer AT resources. Nonetheless, Mwape and

Banda (2020) conducted a general review of inclusive education implementation without collecting empirical data from Computer Studies teachers specifically. Their conclusions are based on broader observations across subject areas. Therefore, a gap exists in empirical evidence specifically from Computer Studies teachers in mainstream Lusaka secondary schools. The present study addresses this gap by providing primary data directly from Computer Studies teachers, rather than relying on general reviews or studies from other subject areas.

Measures for Improving Effective Use of AT

Globally, researchers have proposed various measures for improving effective AT use. Kelly and Smith (2020) suggest that mandatory AT training modules should be integrated into all teacher education programmes, not just special education courses. However, this recommendation is based on research in the United States, where teacher education programmes already have the infrastructure, faculty expertise, and resources to add AT modules. In Zambia, teacher education programmes often lack basic resources, and AT expertise among faculty is rare. Therefore, a gap exists in understanding whether Kelly and Smith's (2020) recommendation is feasible in the Zambian context, or whether alternative, context-appropriate measures are needed. The present study addresses this gap by exploring what measures Computer Studies teachers in Lusaka District themselves perceive as feasible, which may differ from global recommendations.

Furthermore, Zhou and Smith (2021) argue that schools should establish dedicated AT support teams comprising trained staff who can provide ongoing technical assistance and professional development. Nonetheless, Zhou and Smith's (2021) recommendation assumes that schools have the budget and staffing allocation to create dedicated teams. In Zambia, mainstream secondary schools operate with minimal staffing and no budget lines for AT support. The present study addresses the gap by identifying context-appropriate alternatives to dedicated teams, such as rotating district-level AT specialists or peer support models, as suggested by teachers themselves.

Researchers such as Booth and Jones (2019) highlight that policy measures including dedicated AT budgets and procurement guidelines are necessary to ensure sustainable access to functional devices. However, Booth and Jones (2019) studied AT policy in the United Kingdom, where national budgets and procurement systems are well-established. Zambia does not have a national AT procurement guideline or dedicated budget line for AT in mainstream schools. Therefore, a gap exists in understanding what policy measures are actually achievable in Zambia's fiscal and administrative context. The present study addresses this gap by documenting teachers' suggestions that are realistic within the Zambian policy environment.

Additionally, Presley and D'Andrea (2009) assert that schools should adopt a "universal design for learning" (UDL) approach, where AT considerations are integrated into curriculum design rather than added as afterthoughts. However, Presley and D'Andrea's (2009) UDL framework was developed in the United States, where curriculum development includes stakeholder consultation and accessibility reviews. In Zambia, the Computer Studies curriculum was developed without AT considerations. Therefore, a gap exists in understanding how to retrofit UDL principles onto an existing inaccessible curriculum. The present study addresses this gap by exploring teachers' practical suggestions for making the current Computer Studies curriculum more accessible, rather than redesigning it from scratch.

In Africa, proposed measures include government-led AT distribution programmes and public-private partnerships. Bahati (2023) suggests that teacher training colleges should revise their curricula to include practical AT integration modules. Nonetheless, Bahati's (2023) Tanzanian study provides relevant African context, but Tanzania and Zambia have different teacher training systems, with different curricular revision processes and timelines. Furthermore, Bahati did not specify what content should be included in AT modules for Computer Studies teachers specifically. The present study addresses this gap by identifying the specific AT competencies that Computer Studies teachers in Lusaka District believe should be included in revised curricula.

Juma and Ntulo (2024) contend that schools should establish maintenance agreements with local technology vendors to ensure timely repairs. Although Juma and Ntulo's (2024) study covered multiple East African countries, they did not examine the feasibility of maintenance agreements in locations where no local technology vendors have AT expertise. In parts of Lusaka District, finding vendors who understand screen readers or braille

displays may be impossible. The present study addresses this gap by identifying alternative maintenance strategies that teachers in such contexts have developed or suggest.

Mwaura and Omondi (2022) in Kenya highlight that peer mentoring among teachers can serve as an effective low-cost measure for sharing AT knowledge and troubleshooting strategies. Nevertheless, Mwaura and Omondi's (2022) study did not evaluate the effectiveness of peer mentoring specifically for Computer Studies teachers, who require technical knowledge beyond general AT use. The present study addresses this gap by exploring whether Computer Studies teachers in Lusaka District perceive peer mentoring as feasible and effective for sharing subject-specific AT strategies, such as teaching keyboard shortcuts or screen reader navigation for programming environments.

Furthermore, Ogunleye and Adebayo (2020) argue that non-governmental organisations and disability advocacy groups should collaborate with schools to provide AT training and resources. However, Ogunleye and Adebayo's (2020) Nigerian study did not specify which NGOs or advocacy groups are most effective, nor did it address the sustainability of NGO-dependent models once external funding ends. The present study addresses this gap by examining Zambian teachers' experiences with NGO-supported AT initiatives and their suggestions for making such collaborations more sustainable.

In Zambia, recent studies have proposed context-specific measures. Kandimba et al. (2025b) assert that improving accessibility to inclusive education requires a multi-pronged approach including policy reinforcement, resource allocation, and continuous professional development for teachers. The authors further contend that schools should adopt collaborative models where teachers share successful strategies for supporting learners with disabilities. However, Kandimba et al. (2025b) focused on primary schools and general inclusive education accessibility, not secondary Computer Studies or AT. The present study addresses this gap by examining which components of this multi-pronged approach Computer Studies teachers in Lusaka District prioritise for AT integration specifically, and whether collaborative models proposed for primary schools are transferable to secondary Computer Studies contexts.

Bwalya et al. (2026), Ng'uni & Kandimba (2026) argue that training teachers on appropriate instructional mediums is essential, and that such training should be practical and ongoing rather than one-time workshops. Nonetheless, Bwalya et al. (2026) studied sign language as a medium of instruction for learners with hearing impairments. While the principle of ongoing practical training applies, the content and delivery of AT training for Computer Studies teachers differs significantly from sign language training (Bwalya, Mwamba & Kandimba, 2026).

The present study addresses this gap by identifying the specific practical skills (e.g., installing screen readers, configuring accessibility settings, teaching keyboard shortcuts, basic troubleshooting) that Computer Studies teachers in Lusaka District believe should be included in ongoing training.

Additionally, Kandimba et al. (2023) observe that teachers in Zambia would benefit from formal mentoring programmes where experienced inclusive education practitioners guide classroom teachers on adapting instruction for learners with diverse needs.

Nevertheless, Kandimba et al. (2023) focused on curriculum adaptation for learners with intellectual disabilities and did not address AT or Computer Studies. Mentoring for AT integration requires mentors who possess both subject-specific Computer Studies knowledge and AT expertise, a combination that is rare in Zambia. The present study addresses this gap by exploring alternative mentoring models that do not rely on currently unavailable AT specialists, such as virtual mentoring, peer mentoring among Computer Studies teachers, or mentoring that combines a Computer Studies teacher with an AT specialist from elsewhere.

However, a gap exists in understanding which measures Computer Studies teachers in Lusaka District specifically perceive as most feasible and effective for their context. The present study uniquely addresses this gap by gathering direct suggestions from Computer Studies teachers themselves, grounding recommendations in their lived experiences rather than borrowing from other contexts or disability categories.

Gaps in Literature

A careful review of existing literature reveals several significant gaps. First, while studies have been conducted on AT for learners with visual impairment in Africa, the majority have focused on East African countries such as Kenya and Tanzania, or South Africa, leaving Zambia under-researched. Second, existing Zambian studies such as Kaulu (2019) focused on a specialised institution rather than mainstream schools, yet Zambian policy advocates for inclusive education in mainstream settings. Third, although recent Zambian studies by Kandimba et al. (2025a; 2025b) and Bwalya et al. (2026) have explored pedagogical approaches, accessibility, and instructional mediums for learners with various disabilities, none have specifically examined Computer Studies as a subject area, despite its unique requirements for visual access to graphical interfaces, code, and text. Fourth, existing research has predominantly focused on learner outcomes rather than teacher perceptions, yet teachers are the primary implementers of AT in classrooms. Finally, no study has systematically documented the specific measures that Computer Studies teachers in Lusaka District believe would improve AT effectiveness. This study therefore fills these gaps by focusing specifically on teachers' perceptions, challenges, and suggested measures within the unique context of mainstream secondary schools teaching Computer Studies in Lusaka District, Zambia.

METHODOLOGY

This study adopted a qualitative research approach, which is appropriate for exploring participants' perceptions, experiences, and suggestions in depth. According to Creswell and Poth (2018), qualitative research enables the researcher to understand the meanings that individuals attach to social phenomena, making it suitable for studying teachers' subjective perceptions of AT. Specifically, the study employed a phenomenological research design, which seeks to understand the lived experiences of participants regarding a particular phenomenon. Van Manen (2016) asserts that phenomenology allows researchers to explore how individuals make sense of their experiences, which aligned with this study's aim of understanding teachers' perceptions, challenges, and suggested measures regarding AT integration.

The study was conducted in Lusaka District, Zambia, targeting mainstream secondary schools that enrolled learners with visual impairment in Computer Studies. Using purposive sampling, the researcher selected twelve Computer Studies teachers from four secondary schools. Purposive sampling is recommended by Patton (2015) for qualitative studies because it enables the researcher to select participants who possess relevant knowledge and experience related to the research phenomenon. Inclusion criteria required that participants be qualified Computer Studies teachers currently teaching at least one learner with visual impairment, and that they had experience using or attempting to use AT in their lessons.

Data were collected using two primary instruments: semi-structured interviews and classroom observations. Semi-structured interviews were conducted with each of the twelve participants, lasting between 45 and 60 minutes. The interview guide contained open-ended questions aligned with the three research objectives, exploring teachers' perceptions of AT influence, challenges experienced, and measures for improvement. All interviews were audio-recorded with participants' consent and transcribed verbatim. Additionally, classroom observations were conducted for each teacher over two Computer Studies lessons, focusing on teacher-learner interactions, AT usage, and classroom dynamics. Observation notes were recorded using an observation protocol.

Data analysis followed thematic analysis procedures outlined by Braun and Clarke (2006), which involves six phases: familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining themes, and writing up findings. Transcripts were coded manually, and themes were developed inductively from the data. To ensure trustworthiness, the study employed member checking, where participants reviewed transcripts to confirm accuracy; peer debriefing, where a colleague researcher reviewed coding decisions; and thick description, providing detailed contextual information to enable transferability. Ethical considerations included obtaining informed consent from all participants, ensuring confidentiality through pseudonyms, securing institutional approval from the University of Zambia Research Ethics Committee, and obtaining

permission from the Lusaka District Education Board.

Presentation of Findings

The findings of the study were presented according to the research objectives, covering: the nature of Assistive Technology available, teachers' perceptions of the influence of AT on academic performance, teacher experiences of challenges in integrating AT and measures for improving effective use of AT.

Findings Related to Teachers' Perceptions of AT Influence on Academic Performance

The first objective sought to explore how teachers perceive the influence of assistive technology on the academic performance of learners with visual impairment in Computer Studies. Analysis of interview and observation data revealed three main themes: enhanced independent participation, improved confidence and motivation, and increased accuracy in completing computing tasks.

Theme 1.1: Enhanced Independent Participation

All twelve teachers perceived that AT positively influences learners' ability to participate independently in Computer Studies lessons. Teacher T3 stated that:

"When a learner with visual impairment has a screen reader like JAWS, they can open the computer, open a word processor, type a document, and save it all by themselves. Without it, they are completely dependent on the teacher or a sighted classmate. I perceive this independence as the biggest influence on their academic performance because they are no longer passive observers but active participants."

Teacher T7 similarly opined that:

"Before we got the NVDA screen reader, my learner with visual impairment would just sit and listen. Now that same learner navigates folders, opens applications, and even browses the internet for research. This independent participation directly translates to better performance because they are doing the same tasks as sighted learners."

During classroom observations, the researcher noted that in Teacher T7's lesson on file management, the learner with visual impairment successfully created, renamed, and organised folders using keyboard commands with the screen reader, completing all tasks within the same timeframe as sighted peers.

Theme 1.2: Improved Confidence and Motivation

Nine teachers perceived that AT influences academic performance indirectly by boosting learners' confidence and motivation. Teacher T5 asserted that:

"When learners discover they can 'see' the computer through sound, a transformation happens. Their confidence increases dramatically. One of my learners used to say 'I can't do this' whenever we had practical work. After three weeks of consistent screen reader use, he now says 'Let me try first.' This confidence is powerful for performance because they attempt tasks instead of avoiding them."

Teacher T1 highlighted that:

"Motivation is a key factor in learning Computer Studies, which requires patience and practice. I have observed that my learners with visual impairment who use AT consistently show higher motivation levels. They ask questions, they explore features on their own, and they complete homework assignments. I perceive that AT makes the subject accessible, and accessibility breeds motivation."

Theme 1.3: Increased Accuracy in Completing Computing Tasks

Eight teachers perceived that AT improves academic performance through enabling greater accuracy in computing tasks. Teacher T10 contended that:

"Without magnification or screen reading software, my low-vision learners would press keys incorrectly or click the wrong menu items. With AT, they can confirm what they are selecting. Their accuracy in tasks like formatting text, saving files, and navigating menus has improved significantly. This accuracy directly affects their scores on practical assessments."

Teacher T12 observed that:

"When marking practical work, I have noticed that learners using AT make fewer errors than they did before AT was available. For example, in spreadsheet lessons, the screen reader announces cell references, so they enter data in the correct cells. This accuracy has raised their average practical test scores from about 40% to around 65%."

Findings Related to Challenges Experienced by Teachers in Integrating AT

The second objective aimed to establish how teachers experience the challenges of integrating AT to support learners with visual impairment. Three themes emerged: insufficient AT devices and resources, inadequate teacher training and technical knowledge, and infrastructural limitations.

Theme 2.1: Insufficient AT Devices and Resources

All twelve teachers experienced challenges related to insufficient availability of AT devices. Teacher T4 explained that:

"At our school, we have one laptop with JAWS screen reader for five learners with visual impairment who take Computer Studies. How can these learners all get sufficient practice time? During my lessons, each learner gets maybe ten minutes of hands-on computer time while waiting for the device. This is not enough to develop proficiency."

Teacher T8 similarly stated that:

"We have forgotten to budget for assistive technology. We have many computers in the lab, but only two have magnification software. The rest have standard Windows without any accessibility features enabled. When learners with low vision try to use standard computers, they strain their eyes and give up. The shortage of AT devices is my biggest daily challenge."

Teacher T2 highlighted that even where devices exist, they are often outdated:

"The screen reader we have is version 14, but current version is 2024. It crashes frequently and doesn't work well with our Windows 11 computers. I experience frustration every lesson because I spend more time restarting the software than teaching."

Theme 2.2: Inadequate Teacher Training and Technical Knowledge

Ten teachers experienced challenges related to lack of training. Teacher T6 asserted that:

"I completed my teaching diploma and degree without a single course on assistive technology. Everything I know about JAWS and NVDA I learned from YouTube videos in my own time. I experience anxiety during lessons because I cannot troubleshoot when problems arise. When the screen reader stops speaking, I panic because I do not know how to restart the audio service."

Teacher T9 highlighted that:

"Training is not just about how to use the software yourself. It is about how to teach learners who use the software. I do not know the keyboard shortcuts for JAWS beyond the basics. I cannot effectively teach my learners when I only know 20% of what the software can do. This lack of knowledge makes me feel like an imposter."

During classroom observations, the researcher noted an incident in Teacher T9's lesson where the screen reader became unresponsive. The teacher attempted to restart the software for ten minutes without success, eventually abandoning the lesson and asking learners to read from a printed handout instead.

Theme 2.3: Infrastructural Limitations

Seven teachers experienced challenges related to unreliable electricity and internet connectivity. Teacher T11 observed that:

"Zambia experiences load shedding, and our school is not spared. When power goes off during a Computer Studies lesson, all AT becomes useless because the computers shut down. Learners with visual impairment lose their place, their unsaved work, and their motivation. I experience helplessness when this happens because there is nothing I can do."

Teacher T7 added that:

"Some AT software requires internet activation or updates. Our school internet is slow and unreliable. When the license needs to renew online, we sometimes wait two weeks for IT support to arrange it. During that time, the software stops working. I have learned to expect these disruptions."

Findings Related to Suggested Measures for Improving Effective AT Use

The third objective sought to suggest measures for improving the effective use of AT to enhance academic performance. Three themes emerged: comprehensive teacher training programmes, provision of adequate and sustainable AT resources, and establishment of technical support and maintenance systems.

Theme 3.1: Comprehensive Teacher Training Programmes

All twelve teachers suggested that mandatory AT training should be provided. Teacher T3 suggested that:

"The Ministry of Education should require every computer studies teacher to complete a certificate in assistive technology before they can teach learners with visual impairment. This training should be practical, not just theory. We need to practice with JAWS, NVDA, ZoomText, and braille displays until we are confident."

Teacher T5 proposed that:

"Training should be ongoing, not one-time. I suggest that schools establish weekly peer training sessions where teachers who are more experienced with AT share tips with others. Also, online communities of practice where Zambian computer studies teachers can ask questions and share solutions would be very helpful."

Theme 3.2: Provision of Adequate and Sustainable AT Resources

Ten teachers suggested measures for ensuring adequate AT resources. Teacher T1 recommended that:

"The government should allocate a specific budget line for assistive technology in every mainstream school that enrolls learners with visual impairment. Currently, AT is an afterthought. I suggest that each school should have a ratio of one AT-equipped computer for every two learners with visual impairment."

Teacher T8 suggested that:

"Schools should explore open-source AT solutions that are free. NVDA screen reader is free and very capable, but many teachers do not know about it. I suggest that the Ministry of Education should develop a standard AT package for all schools consisting of free and low-cost software that is easy to maintain."

Theme 3.3: Establishment of Technical Support and Maintenance Systems

Nine teachers suggested that functional maintenance systems are essential. Teacher T4 suggested that:

"Our school has no technician who understands assistive technology. When JAWS stops working, we wait months for help. I suggest that the district education office should appoint an AT specialist who rotates among schools, visiting each school once per week to troubleshoot issues and train teachers."

Teacher T11 proposed that:

"Schools should sign service agreements with local computer repair shops that are trained on AT maintenance. Additionally, I suggest that learners with visual impairment should be taught basic troubleshooting skills so they can solve simple problems like restarting the screen reader audio service without teacher assistance."

DISCUSSION OF FINDINGS

The findings of the study were discussed according to the research objectives, covering: the nature of Assistive Technology available, teachers' perceptions of the influence of AT on academic performance, teacher experiences of challenges in integrating AT and measures for improving effective use of AT.

The first objective explored how teachers perceive the influence of assistive technology on the academic performance of learners with visual impairment in Computer Studies. The findings revealed that teachers perceive AT as positively influencing academic performance through enhanced independent participation, improved confidence and motivation, and increased accuracy in completing computing tasks. These findings align with global literature. For instance, Kelly and Smith (2020) similarly found that teachers in the United States perceived AT as enabling independent participation, which directly correlated with improved academic outcomes. Additionally, Zhou and Smith (2021) assert that AT boosts learner confidence by reducing the anxiety associated with inaccessible interfaces, which is consistent with this study's finding regarding improved confidence and motivation.

In the African context, these findings are consistent with Bahati (2023), who observed that teachers in Tanzania perceived AT as improving learners' confidence and access to digital content. Furthermore, Juma and Ntulo (2024) contend that AT influences performance by enabling learners to complete tasks previously impossible, which mirrors this study's finding on increased accuracy. In the Zambian context, these findings complement the observations of Kandimba et al. (2025a), who argue that appropriate pedagogical tools directly enhance learner engagement and performance. Similarly, Bwalya et al. (2026) assert that when learners with disabilities have access to appropriate instructional mediums, their academic participation and outcomes improve significantly. However, this study contributes new insights by specifically identifying how AT influences Computer Studies tasks such as file management, text formatting, and spreadsheet navigation, which have not been detailed in previous Zambian research.

The implications of these findings for policy and practice are significant. First, policymakers should recognize that teacher perceptions are generally positive, indicating readiness to embrace AT if adequately supported. Second, the finding that AT enhances independent participation suggests that investment in AT is an investment in learner autonomy, which aligns with inclusive education principles. Third, given that teachers perceive a direct link between AT and improved accuracy on practical assessments, curriculum developers should integrate AT-focused learning outcomes into the Computer Studies syllabus. Practically, school administrators should

prioritize AT procurement, as teachers clearly perceive its academic benefits.

The second objective established how teachers experience the challenges of integrating AT. The findings identified three major challenges: insufficient AT devices and resources, inadequate teacher training and technical knowledge, and infrastructural limitations including unreliable electricity and internet connectivity. These findings strongly align with global literature. Kelly and Smith (2020) identified inadequate teacher training as the most frequently reported challenge globally, while Booth and Jones (2019) highlighted

insufficient technical support as a persistent barrier. Similarly, this study found that teachers experienced significant anxiety and frustration due to lack of training.

In Africa, these findings are remarkably consistent with existing studies. Nkosi and Dlamini (2021) in South Africa found that teachers experienced shortages of AT devices, with many schools lacking any screen reader licenses. Juma and Ntulo (2024) observed that teachers experienced psychological challenges including low self-efficacy when unable to make AT function properly, which resonates with this study's finding of teacher anxiety and feelings of being "an imposter." Furthermore, Bahati (2023) identified unreliable electricity as a major barrier in Tanzania, consistent with this study's findings regarding load shedding in Zambia.

In the Zambian context, these findings strongly corroborate recent research. Kandimba et al. (2023) observed that teachers in Zambia demonstrate limited understanding of how to adapt instruction for learners with disabilities, which aligns with this study's finding that teachers lack AT training. Furthermore, Kandimba et al. (2025a) contend that teachers in Luanshya District experienced significant resource shortages and inadequate preparation, mirroring the challenges reported by Computer Studies teachers in Lusaka. Bwalya et al. (2026) similarly argue that without systematic training on appropriate instructional mediums, teachers cannot effectively support learners with disabilities. This study uniquely contributes by documenting the specific experience of obsolete software versions being incompatible with modern operating systems, a gap not previously detailed in Zambian literature. Additionally, this study extends existing knowledge by focusing specifically on Computer Studies, a subject with unique visual demands not addressed in previous Zambian research on intellectual disabilities or hearing impairments.

The implications for policy and practice are urgent. Policymakers must recognize that the gap between policy and practice is not merely a resource issue but also a capacity issue. The finding that teachers completed their training without any AT courses indicates a fundamental flaw in teacher education curricula, a concern also raised by Kandimba et al. (2025b) regarding the need for continuous professional development. Therefore, policy should mandate AT training for all computer studies teachers. Additionally, the finding that schools lack technicians who understand AT suggests that the Ministry of Education should establish an AT specialist cadre. Practically, schools should develop contingency plans for power outages, such as investing in solar-powered laptop carts. Furthermore, district education officers should conduct AT audits to establish accurate data on device shortages and inform procurement decisions.

The third objective suggested measures for improving effective AT use. Teachers proposed three main measures: comprehensive teacher training programmes, provision of adequate and sustainable AT resources, and establishment of technical support and maintenance systems. These suggestions align with global recommendations. Kelly and Smith (2020) argued for mandatory AT training modules in teacher education, which mirrors this study's finding that training should be compulsory and practical. Zhou and Smith (2021) suggested establishing dedicated AT support teams, consistent with teachers' proposals for AT specialists and peer mentoring.

In Africa, these findings resonate with existing recommendations. Bahati (2023) advocated for government-led AT distribution programmes, while Juma and Ntulo (2024) proposed maintenance agreements with local vendors. Mwaura and Omondi (2022) highlighted peer mentoring as a low-cost measure, which aligns with this study's suggestion for peer training sessions. In the Zambian context, these findings are strongly supported by recent literature. Kandimba et al. (2025b) assert that improving accessibility to inclusive education requires a multi-pronged approach including policy reinforcement, resource allocation, and continuous professional development. The authors further contend that collaborative models where teachers share successful strategies are essential. Bwalya et al. (2026) argue that training teachers on appropriate instructional mediums should be practical and ongoing rather than one-time workshops, directly supporting this study's finding regarding ongoing training. Additionally, Kandimba et al. (2023) observe that formal mentoring programmes would benefit Zambian teachers, which aligns with the peer mentoring suggestion. This study contributes uniquely by specifically suggesting that learners with visual impairment should be trained in basic troubleshooting, an empowering measure not widely discussed in existing literature. Additionally, the suggestion for open-source solutions such as NVDA screen reader is particularly relevant for resource-constrained Zambian contexts.

The implications for policy and practice from these findings are actionable. For policy, the Ministry of Education should revise the teacher education curriculum to include a compulsory module on AT for computer studies teachers. Additionally, a national AT procurement and distribution policy should be developed, specifying device-to-learner ratios and maintenance protocols. For practice, school administrators should establish AT user groups where teachers share knowledge, and should negotiate service agreements with local computer technicians. Finally, teachers themselves should advocate for open-source AT solutions while awaiting government provision, taking initiative to download and learn free software such as NVDA and LibreOffice with accessibility features enabled.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study explored teachers' perceptions of the use of assistive technology in influencing the academic performance of learners with visual impairment in Computer Studies in Lusaka District, Zambia. The study concludes that teachers hold positive perceptions regarding AT's influence on academic performance, specifically noting enhancements in independent participation, confidence, and task accuracy. However, these positive perceptions are severely constrained by significant challenges including inadequate AT devices, lack of teacher training, and infrastructural limitations. The study further concludes that teachers have clear and practical suggestions for improvement, including comprehensive training, adequate resource provision, and functional maintenance systems. Despite policy commitments to inclusive education in Zambia, a persistent gap exists between policy rhetoric and classroom reality. As stated by other scholars, increasing accessibility to inclusive education requires intentional, sustained investment in both human and material resources. Without urgent intervention, learners with visual impairment will continue to be excluded from meaningful participation in Computer Studies, compromising their future educational and employment opportunities in an increasingly digital economy.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. The Ministry of Education, through the Curriculum Development Centre and Teacher Education departments, should mandate a practical AT certification course for all Computer Studies teachers. School administrators should establish weekly peer mentoring sessions in schools.
2. The Ministry of Education, in collaboration with the Ministry of Finance, should allocate a dedicated annual budget to achieve one AT-equipped computer for every two learners with visual impairment. School procurement officers should immediately adopt open-source AT solutions like NVDA.
3. The Lusaka District Education Office should appoint a rotating district-level AT Specialist. School heads should sign maintenance agreements with local computer technicians. Teachers should train learners with visual impairment in basic troubleshooting.

Conflict of Interest Statement

The author declares no conflicts of interest.

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