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FACULTY OF SOCIAL SCIENCES AND HUMANITIES

DEPARTMENT OF SOCIAL WORK

BARRIERS AND OPPORTUNITIES IN THE USE OF ASSITIVE TECHNOLOGIES FOR THE INCLUSION OF CHILDREN LIVING WITH DISABILITIES IN PRIMARY EDUCATION IN ZIMBABWE: STUDY OF ST GILES IN HARARE

BY

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A Dissertation submitted to Bindura University of Science Education Faculty of Science and Humanities, Department of Social Work, in partial fulfilment of the requirements for the Bachelor of Science Honours Degree in Social Work.

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APPROVAL FORM

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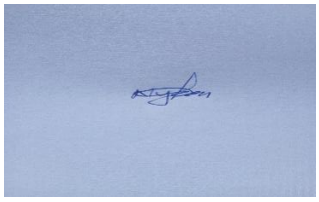
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DEDICATION

I would like to dedicate this project to my parents, Grace Munyikwa and Timothy Chida, who have been my rock and inspiration throughout my life. Their unwavering belief in my abilities and potential has been a constant source of motivation, driving me to work hard and persevere through the various challenges I have faced. To my loving family and friends, who have supported me financially, socially, and emotionally, I extend my heartfelt gratitude. Your collective efforts have enabled me to complete this project, and I am deeply thankful for your presence in my life. Your love, kindness, and generosity have made a significant differences in my journey, and I am honored to have you all by my side. This project is a reflection of power of love, support, and determination. I hope that will inspire others to pursue their passions and dreams.

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ABSTRACT

This qualitative study investigated the barriers and opportunities in the use of assistive technologies (AT) for the inclusion of children living with disabilities in primary education in Zimbabwe, with specific focus on St Giles Special School in Harare, revealing that despite progressive policy frameworks including Zimbabwe's Constitution Section 83, the CRPD ratification (2013), and the newly launched National Assistive Technology Strategy (2024), a significant gap persists between policy aspirations and the lived reality for children with disabilities accessing AT in educational settings. Guided by three objectives to identify the types of AT currently available, explore barriers to AT use, and investigate opportunities for promoting inclusion and grounded in the Social Disability Model (Oliver, 1983), the study adopted a qualitative multiple case study design, collecting data through semi-structured interviews with 5 special needs teachers and 5 parents/caregivers, focus group discussions with 7 children with disabilities, and key informant interviews with 6 professionals, yielding a total sample of 25 participants purposively selected from St Giles Special School, with thematic analysis employed for data analysis. The findings revealed severe inadequacies in AT availability: mobility devices met only 40% of need (15 wheelchairs for over 60 children), communication devices met less than 10% of need, and digital learning tools were completely absent. Five interconnected categories of barriers were identified financial constraints, technological barriers, systemic barriers, social barriers, and knowledge gaps which profoundly restricted children's participation in reading, writing, classroom interactions, play-based learning, educational progression, and self-care activities, with the social worker highlighting a safeguarding crisis where children unable to communicate effectively cannot report abuse or express pain. Despite these challenges, multiple practical opportunities emerged, including low-cost locally produced solutions, training as a viable investment, mobile-based accessibility features on parents' own Android phones, and decentralization of service delivery to district-level hubs, with participants identifying six key strategies: establishing a national essential AT list for primary education, mandating AT modules in pre-service teacher training, decentralizing AT assessment and repair hubs, creating public-private partnerships, implementing an "AT Passport" for transitioning students, and community conscientization. The study concluded that barriers to AT use at St Giles are not merely resource constraints but systematic failures of policy coordination, training infrastructure, service geography, and community attitudes, and advanced recommendations for government, St Giles practitioners, and NGOs. Implications for policy include shifting from device donation to systems building, establishing inter-ministerial coordination, and integrating AT into curriculum, while implications for social work practice emphasize advocacy, psychosocial support, safeguarding protocols, and community conscientization. This study contributes to the scarce body of literature on AT and inclusive education in Zimbabwe and Sub-Saharan Africa,

demonstrating that while opportunities are genuine and within reach, political will is required to reorganize existing resources, mandate training, decentralize services, and conscientize communities, because without these changes, children with disabilities will continue to be excluded from meaningful educational participation.

LIST OF ABBREVIATIONS

AAC	Augmentative and Alternative Communication
ACRWC	African Charter on the Rights and Welfare of the Children|
AT	Assistive Technology
CWD	Children with Disabilities
CRC	Convention on the Rights of the Child
CRPD	Convention on the Rights of Persons with Disabilities
FDG	Focus Group Discussion
GATE	Global Cooperation on Assistive Technology
ICF	International Classification of Functioning, Disability and Health
ICT	Information and Communication Technology
IDI	In-Depth Interview
KII	Key Informant Interview
MoPSE	Ministry of Primary and Secondary Education
NGO	Non-Governmental Organisation
PECS	Picture Exchange Communication System
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
WHO	World Health Organization
ZIMSTAT	Zimbabwe National Statistics Agency

CHAPTER ONE

INTRODUCTI ON

This study focuses on the barriers and opportunities in the use of Assistive Technologies (AT) for the educational inclusion of children living with disabilities in primary education in Zimbabwe, with a specific focus on St Giles in Harare. The central premise of this research is that while AT holds transformative potential to enable access, participation, and learning for children with disabilities, its effective use is mediated by a complex interplay of factors that are not yet fully understood within the Zimbabwean context.

1.1 BACKGROUND OF THE STUDY

The history of Assistive Technology (AT) began with specialized equipment designed to address specific barriers for people with disabilities. In the 1800s, two foundational inventions emerged which was braille and the hearing aid. The 1900s brought refinements to these technologies hearing aids became smaller and more portable, and the portable Perkins Braille Typewriter was invented. The 1900s also witnessed an explosion of new AT inventions, including talking books on phonographs, the first electronic speech synthesizer (by AT&T), the Sip and Puff Wheelchair, the Kurzweil Reading Machine (which used scanning to read books aloud), and the Adaptive Firmware Card (which enabled people with limited mobility to use a keyboard). During the late 1900s, further advancements emerged, devices that allowed communication using only eye movement, computer (text-to-speech) programs for accessing written materials, and Frequency Modulated (FM) Systems to support people with hearing loss in noisy environments. The 2000s brought significant updates and smart devices. The Eye-mask System was enhanced to help people with paralysis and cerebral palsy interact with on-screen keyboards to produce spoken text. Cochlear implants were updated to better stimulate the auditory nerve. SMART Tables (touch technology surfaces) were invented to support students with motor challenges in inclusive classrooms. The DEKA Robotic Arm was designed for injured war veterans needing precise grip and pressure. Desktop and laptop computers were upgraded with screen readers and screen

magnification. Smart tablets from Apple, Microsoft, and Google all incorporated built-in accessibility features. Finally, while businesses used online video meetings as early as the 1970s, free tools like Skype and iChat made the feature widely available in the early 2000s. Starting in early 2020, video conferencing usage skyrocketed, further enhancing accessibility for people with disabilities. Over subsequent decades, technological advancements have dramatically expanded both the range and effectiveness of assistive technologies available to persons with disabilities (Buning, 2004).

International Legal Framework such as the Convention on the Rights of Persons with Disabilities (CRPD) establishes fundamental protections for children with disabilities through several key provisions. Article 7 obligates States Parties to ensure that children with disabilities enjoy all human rights and fundamental freedoms equally with other children. Multiple additional CRPD articles recognize assistive technology as essential to this mission, urging member states to ensure availability at affordable costs. Assistive technology serves as the foundational step enabling children with disabilities to play with peers, access education, and eventually become contributing members of society (United Nations, 2006).

The United Nations Children's Funds (UNICEF) (2022) reveals that over 2.5 billion people require assistive devices, yet nearly one billion lack access to them. This access gap disproportionately affects low and middle-income countries, where availability can be as low as 3%. Children in low-income nations experience the most significant marginalization, with girls living with disabilities facing compounded disadvantages. UNICEF (2023) reports that nearly 11 million children with disabilities in Europe and Central Asia face denied access to responsive care and social protection due to stigma, institutionalization, and physical barriers. In the United States, the Centers for Disease Control and Prevention estimates that 17 percent of children aged three to seventeen have some form of special needs.

The African Charter on the Rights and Welfare of the Children (ACRWC), adopted by the African Union, recognizes the right of children with disabilities to access basic needs including assistive technology (African Committee of Experts on the Rights and Welfare of the Child, 2022).However , research indicates that only five to fifteen percent of assistive technology needs are met in many developing countries (WHO, 2022). Common barriers include limited government funding, inadequate awareness, shortage of trained personnel, and insufficient policy support. A study by

Moyo (2023) emphasize how economic factors like poverty exacerbate challenges for persons with disabilities in Sub-Saharan Africa. UNESCO data reports significant disability populations across the region, including 1.4 million persons with disabilities in specific countries, 11.6 percent of Malawi's population, three million in Kenya, and 4.5 percent in Botswana (UNESCO, 2021).

Zimbabwe has demonstrated commitment to disability rights through multiple legislative and policy instruments. The country ratified the CRPD in 2013, aligning with Article 20's requirement to ensure assistive technology access for all children with disabilities (Government of Zimbabwe, 2013). This ratification signalled Zimbabwe's intent to shift from a charity-based model of disability to a rights-based approach, recognising persons with disabilities as active rights-holders rather than passive recipients of welfare**.** Section 83 of Zimbabwe's Constitution guarantees assistive technology access for persons with disabilities (Government of Zimbabwe, 2013). This constitutional entrenchment is significant, as it elevates assistive technology access from a policy preference to a fundamental right, offering a degree of legal protection that ordinary legislation cannot easily override. The Education Amendment Act of 2020 mandates non-discrimination and equal access for learners with disabilities. The Act places a positive duty on educational institutions to make reasonable accommodations, which inherently encompasses the provision of appropriate assistive technologies**.,** while the 2021 National Disability Policy promotes social and economic inclusion as it adopts a cross-sectoral approach to disability inclusion, promoting the social and economic participation of persons with disabilities across health, education, and employment domains (Ministry of Public Service, Labour and Social Welfare, 2021). Taken together, these instruments create a layered normative framework that, in principle, supports the provision of assistive technology for children with disabilities in educational settings.

In May 2024, the Government of Zimbabwe, through the Ministry of Health and Child Care, launched the National Strategy for Assistive Technology and Products Priority List. This landmark policy initiative represents a significant step toward addressing the longstanding gaps in assistive technology (AT) provision within the country. The Priority List identifies essential AT products that the government commits to making available, accessible, and affordable for persons with disabilities across Zimbabwe. These priority products include wheelchairs, spectacles, hearing aids, sunscreen creams for persons with albinism, crutches, orthoses, braille displays, and

magnifiers (Ministry of Health and Child Care, 2024). The significance of this national strategy extends far beyond the mere provision of devices. According to the Ministry of Health and Child Care (2024), these assistive products serve multiple critical functions. Firstly, they reduce caregiver burden by enabling persons with disabilities to perform daily tasks independently, thereby alleviating the physical, emotional, and financial strain on family members who would otherwise provide constant support. Secondly, these devices help manage secondary health conditions that often arise from untreated impairments; for example, properly fitted orthoses can prevent joint contractures, while hearing aids can slow auditory nerve degeneration. Thirdly, the strategy explicitly recognises that AT promotes economic growth by enabling persons with disabilities to participate in education, employment, and community life, thereby contributing to the national economy rather than remaining dependent on social welfare systems (Ministry of Health and Child Care, 2024) . For children living with disabilities, these devices play a particularly critical role in enhancing functional independence during formative developmental years. A child using a braille display or magnifier can access the same written curriculum as sighted peers, directly supporting inclusive education as mandated by Zimbabwe's Constitution and the United Nations Convention on the Rights of Persons with Disabilities (CRPD), which the country ratified in 2013 . Section 83 of the Zimbabwean Constitution effectuates a paradigm shift by expressly recognising the rights of persons with disabilities (PWDs) for the first time in the country's constitutional history. Similarly, a child fitted with a hearing aid can participate in classroom discussions, follow verbal instructions, and develop age-appropriate language skills, all of which are foundational to academic success and social integration. Mobility aids such as wheelchairs, crutches, and orthoses facilitate physical access to school buildings, playgrounds, and community spaces, removing the environmental barriers that would otherwise exclude children from educational and social opportunities (Ministry of Health and Child Care, 2024).

Despite these policy advancements, implementation remains severely constrained in practice. The National Assistive Technology Strategy (2024) highlights that access to assistive products in Zimbabwe is hindered by multiple systemic barriers, including high costs, fragmented supply chains, weak regulatory frameworks, limited technical capacity, and inadequate domestic financing (Ministry of Health and Child Care, 2024). These structural challenges undermine the effective delivery and sustainability of assistive technology services, particularly for children in

marginalized and rural communities. Empirical evidence further illustrates the magnitude of the gap between need and access. The Living Conditions Survey conducted by the Zimbabwe National Statistics Agency found that only 14.4% of individuals requiring assistive devices were actually using them, with access disproportionately concentrated in urban areas (Zimbabwe National Statistics Agency, 2013). This urban–rural disparity reflects broader inequalities in infrastructure, service provision, and economic capacity. In the education sector, the situation is equally concerning. Many schools lack adequate resources, specialized learning materials, and trained personnel to effectively support learners with disabilities. As noted by the United Nations Children's Fund (2021), limited teacher training in inclusive education and insufficient provision of assistive learning devices continue to exclude children with disabilities from meaningful participation in schooling. These challenges point to a persistent disconnect between progressive policy commitments and actual service delivery. While Zimbabwe has established a strong legislative and policy framework, the absence of adequate funding, institutional coordination, and monitoring mechanisms continues to limit the realization of assistive technology access for those who need it most.

St Giles School, a specialist institution for children with physical and cognitive disabilities, provides a unique context for exploring how assistive technologies can be effectively deployed to foster genuine inclusion in Zimbabwe. St Giles Medical Rehabilitation Centre and its associated special school provide a unique and well-established context for examining the role of assistive technologies in fostering inclusion in Zimbabwe. Established in the 1952 as a polio rehabilitation center St Giles has grown into one of the country’s leading institutions for disability support, offering a multidisciplinary approach that integrates physiotherapy, occupational therapy, speech therapy, and educational services. The center combines clinical rehabilitation with a special school and boarding facilities, enabling children with physical and cognitive disabilities to access both therapy and education in a coordinated environment. This integrated model allows for the effective use of assistive technologies such as mobility aids, communication devices, and adapted learning materials to enhance independence, participation, and learning outcomes. At the same time, while St Giles represents a model of good practice in Zimbabwe’s disability sector, its limited capacity and accessibility challenges reflect broader systemic constraints in scaling assistive technology services nationwide.

1.2 STATEMENT OF THE PROBLEM

While the potential of Assistive Technologies to foster educational inclusion is well-documented, a significant gap exists between policy aspirations and the lived reality for many children with disabilities in Zimbabwe. The mere presence of AT devices within a school does not guarantee their effective or sustained use, nor does it automatically translate into meaningful educational inclusion. Barriers such as high costs, lack of technical support, insufficiently trained educators and therapists, and negative cultural perceptions can severely limit the impact of AT (Muderedzi & Ingstad, 2011). At St Giles, a center of excellence in rehabilitation, one might anticipate a high level of AT integration. However, evidence and preliminary observations suggest that even in such a resource-advantaged setting, the use of assistive technologies may be sub-optimal. Children may be assessed for and provided with devices, but these may fall into disrepair, prove unsuitable for the classroom environment, or be underutilised due to a lack of teacher confidence or expertise. Furthermore, the process of transitioning a child from a specialised, technology-rich environment like St Giles to a potentially resource-poor mainstream school presents a critical juncture where inclusion can easily falter. There is a lack of empirical research that systematically investigates the specific barriers and opportunities related to AT use within Zimbabwean special schools, and how these factors ultimately influence the goal of inclusive education. This is supported by Zinahwa (2020) noted that "although barriers to inclusive education in Zimbabwe have been identified, systematic empirical investigations into assistive technology use within special schools remain limited." Magaracha and Sibanda (2025) further noted that while policies exist, implementation of AT remains elusive, and they called for continued research across different contexts .This study, therefore, seeks to address this research gap by conducting an in-depth investigation at St Giles Primary School in Harare.

1.3. AIM OF THE STUDY

The primary aim of this study is to investigate the barriers and opportunities associated with the use of assistive technologies in promoting the educational inclusion of children living with disabilities at St Giles Primary School in Harare, Zimbabwe.

1.4. RESEARCH OBJECTIVES

1. To identify the types of assistive technologies currently available for children living with disabilities in primary education in Harare.

2. To explore the barriers faced by children living with disabilities in the use of AT in primary education in Harare.

3. To investigate the opportunities for the use of AT to promote inclusion of children living with disabilities in primary education in Harare.

1.5. RESEARCH QUESTIONS

1. What types of assistive technologies are currently available for children living with disabilities in primary education in Harare.

2. What are the barriers faced by children living with disabilities in the use of AT in primary education in Harare.

3. What opportunities that exist for the use of AT to promote inclusion of children living with disabilities in primary education.

1.6. ASSUMPTIONS

This study assumes that children with disabilities at St Giles Primary School face significant barriers that limit their effective access to and use of assistive technologies for educational inclusion, despite the school being a specialist rehabilitation center. It further assumes that specific, identifiable challenges including financial, technical, logistical, attitudinal, and policy related obstacles make it difficult for these children to benefit fully from assistive technologies. The study also assumes that these barriers can be systematically identified and addressed through targeted strategies, thereby improving educational inclusion and quality of life for these learners. Additionally, it assumes that key stakeholders (children, parents, teachers, and therapists) will provide honest and meaningful insights regarding their experiences with assistive technology. Finally, the study assumes that while St Giles is a relatively resource-advantaged setting, the findings will have transferable value for other special education units and mainstream schools across Zimbabwe**.**

1.7. SIGNIFICANCE OF THE STUDY

This research is expected to make significant contributions at multiple levels

Firstly, for policy and practice, the findings will provide empirical evidence to inform policymakers in the Ministry of Primary and Secondary Education and the Ministry of Public Service, Labour and Social Welfare. By identifying specific barriers and opportunities, the study can contribute to the development of a more effective national AT policy, standardised procurement guidelines, and targeted teacher training programmes.

Secondly, for the Institution St Giles, this study will offer a detailed, systematic analysis of its own AT ecosystem. The results can inform strategic planning, resource allocation, and the development of more holistic and sustainable AT services that bridge the gap between rehabilitation and education. And for other schools and practitioners. The case study of St Giles can serve as a valuable reference point for other special schools and mainstream schools in Zimbabwe and the wider Southern African region that are striving to implement inclusive education. It will highlight both best practices and common pitfalls, offering practical lessons for educators and therapists.

In addition, for academic knowledge this study will contribute to the scarce body of academic literature on AT and inclusive education in the Zimbabwean and Sub-Saharan African context. It will provide a nuanced, qualitative understanding of the complex interplay of factors that shape AT use, moving beyond simple descriptions of barriers to explore the lived experiences of those involved.

1.8. DELIMITATION OF THE STUDY

This study was delimited to St Giles Primary School in Harare, Zimbabwe, as a single case study. It focused exclusively on children with disabilities attending this institution, including physical, cognitive, and communication impairments, and did not extend to children in mainstream schools or other special education units. The research concentrated specifically on barriers and opportunities related to assistive technology use for educational inclusion, examining factors such as finances, technical support, training, attitudes, and policy implementation. The study focused

on the current situation of availability, accessibility, and utilisation of assistive technologies within the school setting, including learner transitions. It did not investigate assistive technology use outside the educational context, nor other disability inclusion interventions unrelated to assistive technology. Finally, participant involvement was delimited to children, parents, teachers, and therapists at St Giles, excluding policymakers and district administrators to maintain a focused school-level analysis**.**

1.9. LIMITATIONS OF THE STUDY

This study acknowledges several limitations. Firstly, it is limited to a single case study of St Giles Primary School, which is a specialist institution, meaning the findings may not be fully transferable to mainstream schools or rural settings in Zimbabwe. Secondly, the study relies on self-reported data from participants, which may introduce social desirability bias where respondents overstate positive practices or underreport challenges. Thirdly, including children with cognitive and communication impairments may present data collection difficulties, as some may not fully articulate their experiences. Fourthly, time and resource constraints limit the observation period and number of participants, potentially missing long-term patterns of assistive technology use. Finally, the study focuses only on the school environment and does not extensively explore home and community contexts that influence sustained technology use.

1.9. DEFINATION OF KEY TERMS

1.9.1 Assistive Technology

The International Classification of Functioning, Disability and Health (ICF) defines assistive products and technology as any product, instrument, equipment or technology adapted or specially designed for improving the functioning of a person with a disability.

1.9.2. Barrier

A barrier is any factor within a person's environment that, through its presence or absence, limits their functioning and creates disability. Barriers represent the obstacles that prevent individuals with disabilities from fully and effectively participating in society on an equal basis with others.

1.9.3. Child Living With Disabilities

According to UNICEF (2021), a child living with disabilities is defined as any child who has a long-term physical, mental, intellectual, or sensory impairment which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.

1.10 CHAPTER SUMMARY

This chapter introduced the study's focus on the barriers and opportunities in the use of assistive technologies for the educational inclusion of children with disabilities at St Giles Primary School in Harare, Zimbabwe. The background highlighted the global and local policy frameworks supporting AT, including the CRPD, Zimbabwe's Constitution Section 83, and the National Assistive Technology Strategy, while noting the persistent gap between policy and practice. The statement of the problem identified that even at a specialist center like St Giles, AT integration remains sub-optimal due to financial, technical, attitudinal, and systemic barriers. The study's aim and objectives were outlined, focusing on identifying available AT, exploring stakeholder perceptions, and investigating enabling factors. Research questions were posed to guide the inquiry. Key assumptions, significance, delimitations, limitations, and definitions of core terms were also presented. Collectively, this chapter established the foundational framework for the empirical investigation that follows.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

1.0 INTRODUCTION

This chapter presents a comprehensive review of existing literature on the barriers and opportunities in the use of assistive technologies for the educational inclusion of children living with disabilities in primary education in Zimbabwe, with specific reference to St Giles Primary School in Harare. It examines key theoretical frameworks, alongside global, regional, and local literature. The chapter sheds light on the unique needs of children with disabilities, the barriers hindering their access to assistive technologies within educational settings, and the strategies that have been employed to address these barriers. By synthesising existing knowledge, this chapter establishes the conceptual foundation for the empirical investigation at St Giles and identifies gaps in the literature that this study seeks to fill**.**

2.1. THEORETICAL FRAMEWORKS

Various frameworks have brought diverse perspectives that have contributed to the existing body of knowledge of assistive technology and this section provides perspectives that guide the study. According to Masoga and Shokane (2018) theories are set of interrelated ideas and paradigms. This indicates how theories are essential in research as they help to understand the barriers and opportunities in the use of assistive technologies for the inclusion of children living with disabilities in primary education in Zimbabwe.

2.2.The Social Disability Model

The social disability model is a theoretical framework that considers disability as a social construct rather than an inherent individual attribute. It was developed in the 1970s by disability rights activists, the main proponent being Michael Oliver who later coined the term social disability model in 1983. It provides a comprehensive framework for researching the inclusion of children

living with disabilities in the provision of assistive technology within educational settings such as St Giles Primary School.

The model is premised upon key tenets that disability has a social origin, recognising that disability is rooted in societal structures and attitudes that disability arises from an interplay between individuals and environmental barriers and the need to remove and address these societal barriers that promote exclusion while promoting the participation of children living with disabilities. It conceptualises disability as a result of the interaction between children with impairments and the barriers present in society, which include systemic barriers and social factors that prevent them from fully participating in primary education.

The model draws a crucial distinction between impairments and disabilities, emphasising that impairments are functional limitations a child can face while disabilities result from societal attitudes and structures that perpetuate exclusion and marginalisation, effectively turning impairments into disadvantages. The key tenets of the model are crucial as they address the research objectives which are to identify barriers encountered in accessing assistive technology for educational inclusion at St Giles, to establish how these barriers hinder the participation of children living with disabilities in learning activities, and to identify strategies to enhance the inclusion of children living with disabilities in the provision of assistive technology.

2.2.1 Barriers The Social Disability Model

According to the social model of disability, disability is not a personal problem or a medical condition but a social construct that is created by barriers in society. It views disability as a product of human definitions and interactions. According to Carmel, Chapman, and Wright (2025)**,** it is society that disables children through systemic barriers, as a social model of disability sees the child as a vibrant, intelligent young person rather than through a deficit-focused biomedical view . Barriers in society can be physical, such as inaccessible school buildings, or attitudinal, such as negative stereotypes or discrimination, and include the ultimate lack of assistive devices. From this perspective, disability is thus an interaction between features of a child's body and features of the society in which they live (WHO, 2017). In order to address this, the social disability model emphasises the need for structural changes to ensure that children living with disabilities have equal access and opportunity in education. Based on this view,

society needs to change to accommodate the diverse needs and abilities of children living with disabilities. It is therefore important to understand the social context in which children at St Giles interact, as this will provide a holistic understanding of the challenges and opportunities for inclusion and help advocate for social change to promote inclusion and accessibility by promoting the transformation of societal attitudes, policies and practices and the creation of enabling environments.

The social disability model also presents the lack of assistive technology as a major factor that inhibits the full participation of children living with disabilities in education. Lewis and colleagues (2025) support the same idea as they indicate that limited access to aiding devices, including low-tech options such as adapted utensils or high-tech devices such as communication boards or mobility aids, can significantly increase participation barriers for children with disabilities. It limits their independence and their chances to navigate public spheres, including school environments. In the case of children living with disabilities at St Giles, limited access to mobility aids such as wheelchairs and walkers, or learning aids such as braille displays and magnifiers, may limit their chances to move around the classroom and perform different learning tasks. Lack of access to assistive technology can also contribute to social exclusion, limiting the participation of children living with disabilities in classroom interactions and play-based learning. Educational opportunities can also be greatly affected due to lack of assistive technology. Hence, it is crucial to promote access to assistive technology for children living with disabilities at St Giles and similar contexts to enhance their participation in educational activities.

2.2.2. Strategies to enhance the inclusion of children living with disabilities in everyday activities

The social disability model presents that children living with disabilities should be able to make their own choices about their own lives based on their preferences, values and goals. According to Berghs, Atkin, and Graham (2024) , this is crucial in improving the self-esteem of children living with disabilities and building a sense of collective identity, as choice and autonomy are central to challenging the marginalisation and stigma that disabled children often face . It advocates for the removal of barriers that prevent children living with disabilities from making their own choices and decisions. On this note, children living with disabilities should be allowed a chance to select

and use assistive devices that meet their specific educational needs. This will empower them to achieve their learning goals and access information, resources and services that are relevant to their needs. This is crucial in promoting their independence within the classroom.

According to the disability model, children living with disabilities are experts in their own experiences and should be involved in decision-making processes that affect them. This highlights the need to enable children living with disabilities to participate in school activities and key decision-making processes regarding their learning. In light of this, assistive technology allows children living with disabilities to exercise their rights and responsibilities as learners. Assistive technology helps these children overcome environmental barriers in the school setting and perform tasks they would otherwise have difficulty doing. It also allows them to participate fully and equally in all aspects of school life, such as literacy, numeracy, and social relationships with peers. The model also emphasises the importance of community participation and collaboration, which can be key in ensuring that children living with disabilities have access to the resources and support they need to use assistive technology.

According to the People with Disabilities Australia (2023), the Social Model of Disability has now become the internationally recognised way to view and address disability. The social disability model was thus adopted for this study as it clearly outlines the challenges faced by children living with disabilities that inhibit them from participating in educational activities and further suggests ways these can be corrected within the context of St Giles Primary School.

2.3 **Evolution of assistive technology for children living with disabilities**

In past years, children living with disabilities faced a lot of discrimination and seclusion from mainstream educational activities due to physical and social limitations. To address these problems, assistive technology was introduced in a bid to engage these children in public spheres, including schools. According to Hollier and Murray (2014**)**, in the 1970s and 1980s, as legislators around the world created new disability and information technology policies, the idea of integrating children with disabilities into mainstream education gained traction, and the rapid take-up of personal computers provided unprecedented educational opportunities through technologies such as voice synthesizers. This period saw more children gaining access to assistive technology as computing tools were adapted to support their educational participation, though challenges around cost and platform choice remained significant.

The provision of assistive technology to children living with disabilities has evolved over time, necessitated by supporting legislation, research, innovation and advocacy. In 2006, the United Nations Convention on the Rights of Persons with Disabilities was adopted by the UN General Assembly as the first human rights treaty to focus specifically on the rights of persons with disabilities. It states that persons with disabilities have the right to access assistive technology and requires states to take measures to ensure its availability and accessibility. It has been ratified by about 180 countries so far. A number of countries have developed national policies and programs based on the principles of the CRPD. The World Health Organization and United Nations Children's Fund (2022) present that assistive technology is a basic human right and that governments have an obligation to ensure that children living with disabilities have access to the technology they need.

In line with this, Zimbabwe developed the National Disability Policy (2021), which includes a focus on the needs of children living with disabilities. These policies recognise that assistive technology is a tool for social inclusion and empowerment. According to Halpin (2023), the use of assistive technology leads to improved educational outcomes for children living with disabilities. While doing so, it is also critical to consider the child's specific needs so that assistive technology is tailored to their educational context. However, barriers to accessing assistive technology still exist at St Giles and across Zimbabwe, ranging from financial, social and technological challenges, which include lack of awareness, limited availability, and affordability issues.

2.4 **Categorisation of children living with disabilities and respective assistive technology needs for primary education**

Children living with disabilities attending St Giles Special School present with various impairments that require specific assistive technologies to facilitate their educational inclusion.

2.4.1 Physical disabilities

Physical disabilities involve the partial or complete impairment of bodily function, typically affecting one or more limbs, leading to potential symptoms such as muscle weakness, poor stamina, lack of muscle control or complete loss of motor function. Conditions such as cerebral palsy, spina bifida, muscular dystrophy, and spinal cord injury may require mobility aids such as wheelchairs and walkers to access the classroom and move around the school environment. For meaningful participation in primary education, children with cerebral palsy a disorder of movement and posture due to a disorder of the developing fetal or infant brain require mobility aids as well as communication aids like speech-generating devices or specialised software to participate in classroom discussions. Children with spina bifida, a neural tube defect resulting in varying degrees of paralysis and muscle weakness, require orthotic devices like braces and splints to support lower limb function, as well as wheelchairs for more severe mobility impairments.

2.4.2 Cognitive and communication impairments

Cognitive and communication impairments also present at St Giles require assistive technologies such as braille displays, magnifiers, adapted learning materials, and speech-generating devices. These technologies directly support inclusive education by enabling children with visual, intellectual, or speech impairments to access the curriculum, complete reading and writing tasks, and interact with teachers and peers. The study considers the full range of disabilities present at St Giles Primary School, recognising that each child's specific condition requires tailored assistive technology solutions to facilitate genuine educational inclusion.

2.5. Barriers in the use of assistive technologies for the inclusion of children living with disabilities in primary education.

2.5.1 Financial barriers

Financial constraints represent the most significant barrier preventing caregivers from securing assistive technology for their children. Consistent with the global estimates of the World Health Organization and Global Cooperation on Assistive Technology (2020), which indicated that only 10% of people with disabilities globally have access to the assistive technology they require, this

study found that the vast majority of caregivers at St. Giles reported being unable to afford essential assistive devices for their children.

Financial constraints aligns with McPherson and Clark's (2017) observation that in low- and middle-income countries, families are forced to choose between basic necessities and assistive devices for their children living with disabilities. The situation at St. Giles reflects the broader Zimbabwean context, where Smythe et al. (2022) attributed limited access to the country's weak economy and lack of resources.

Furthermore lack of private insurance coverage in Zimbabwe exacerbates the financial burden on caregivers. Unlike developed countries where insurance or social safety nets may cover part of the cost of assistive technology (UNESCO, 2019), and high cost of assistive technology is compounded by additional expenses, including transportation to urban centres where devices can be purchased, import duties on devices sourced from outside Zimbabwe, and ongoing maintenance costs. Matter et al. (2017) pinpointed these same financial constraints across Southern Africa, noting that weak healthcare systems, low per capita income, and widespread poverty all contribute to limited availability and affordability. At St. Giles, these challenges are particularly acute given that many families have limited financial resources and live in peri-urban areas with poor access to services.

2.5.2 Social barriers

Social barriers that hinder the use of assistive technology for inclusion at St. Giles Special School. These include stigma and discrimination, negative community attitudes, lack of family education about assistive technology, and social isolation experienced by both caregivers and children.

- **Stigma and Discrimination**

Consistent with the World Health Organization and UNICEF's (2022) finding that caregivers face stigma when seeking help for their children, as their joint report on assistive technology highlights that stigma and discrimination remain pervasive barriers to accessing AT services globally . According to Johnson's (2021) "stigma influences negative attitudes towards the use of assistive technology, resulting in children being unwilling to use devices".

Students with visible assistive devices, such as wheelchairs or hearing aids, experience teasing and bullying when they venture into the wider community. This aligns with the International Disability Alliance (2024) report, which documented that children living with disabilities are often excluded from public areas such as schools and religious spaces.

- **Lack of training and education for families**

Another significant barrier identified at St. Giles is the lack of training and education for families regarding assistive technology. Caregivers they do not understand how specific devices could benefit their children or how to use and maintain them properly. According to Tomczyk (2024), low education levels among caregivers are often due to inadequate educational structures, hindering them from accessing necessary skills to understand assistive technology.

2.5.3. Technological barriers

The study reveals multiple technological barriers that limit the use of assistive technology for inclusion at St. Giles Special School.

- **Lack of Trained Personnel**

Consistent with the findings of Borg, Linstrom and Larsson (2011), this study found a critical shortage of qualified personnel at St. Giles and in the surrounding communities who can assess, prescribe, fit, train, and follow up users of assistive devices. The school have few occupational therapist serving over 200 children with diverse disabilities.

This finding supports the World Health Organization's (2011) assertion that lack of technical expertise and training makes it difficult to repair and maintain assistive technology. Matter, Harniss, Oderud, Borg and Eide (2016) highlighted the same challenge across Sub-Saharan Africa, calling for culturally appropriate solutions.

- **Poor Infrastructure in Zimbabwe**

The study found that Zimbabwe's poor infrastructure significantly impedes access to assistive technology at St. Giles. Consistent with Ndhlovu and Mudzingwa (2022), who documented that the poor state of roads, electricity, and communication networks makes it difficult for children with disabilities to access public institutions and assistive devices, this study found that caregivers struggle to travel to urban centres where devices might be obtained.

- **Lack of locally appropriate and culturally relevant devices**

The study also revealed that most assistive technology available to families at St. Giles is imported and not adapted to the local context. Devices are often designed for users in developed countries and do not account for Zimbabwean environmental conditions, such as rough terrain, dust, and humidity. As Tomczyk (2024) noted, the way digital platforms and websites are designed does not allow children with disabilities to access information, further compounding the problem.

- **Lack of Data on Needs and Availability**

The study found that there is no comprehensive database tracking the assistive technology needs of children at St. Giles or in Zimbabwe more broadly. According to McLachlan and Scherer (2018), lack of data on needs, availability, and affordability perpetuates the lack of accessibility globally. At St. Giles, teachers reported that they do not know which children lack which devices, making it impossible to advocate effectively for resources.

2.6. Limitations encountered by children at St. Giles in primary education

The study documented significant limitations that children living with disabilities at St. Giles encounter in their primary education, despite the school's specialised focus.

2.6.1 Social exclusion within and beyond the school

Consistent with the World Health Organization and World Bank (2020) report that children with disabilities are more likely to experience exclusion from education and social activities, this study found that children at St. Giles are often excluded from peer activities both within the school and

in the wider community. This finding aligns with Wehman (2013), who argued that participation in activities such as classroom group work, peer mentoring programs, and arts clubs benefits children's well-being and development. Vuong and Palmer (2024) highlighted that negative attitudes held by the general population segregate children with disabilities from society.

2.6.2 Limited transition to mainstream schools

A particularly significant finding was the difficulty children at St. Giles face when transitioning to mainstream schools. While St. Giles provides a supportive environment with some access to assistive technology, mainstream schools in Zimbabwe are largely unprepared to accommodate children with disabilities. According to the Ministry of Primary and Secondary Education (2013), only 1.9% of children with disabilities were enrolled in mainstream schools nationally. This is supported by the findings of UNESCO's (2015) report that only 1 in 10 children with disabilities in Sub-Saharan Africa attends school, compared to 9 out of 10 children without disabilities.

2.6.3. Low expectations and limited learning outcomes

The study further found that children at St. Giles often face low expectations from both teachers and families regarding their academic potential. UNESCO's (2018) statistic that the global literacy rate for adults with disabilities is as low as 3%, and 1% for women with disabilities. Without access to appropriate assistive technology, children at St. Giles are unlikely to achieve minimum learning outcomes.

2.7 Opportunities for enhancing inclusion at St. Giles Primary School

2.7.1. International collaborations and partnerships

International collaborations is key though these remain limited. According to Vineda (2019), initiatives like the Global Cooperation on Assistive Technology (GATE) provide forums for countries to share best practices. At St. Giles, a partnership with a non-governmental organisation from South Africa has provided some assistive devices and training for teachers. However, these efforts are not yet systematic or sustained.

2.7.2. Advocacy and Awareness Campaigns

The study found that advocacy and awareness campaigns have begun to shift attitudes among some families and community members at St. Giles. According to the World Health Organization (2016), access to assistive technology is a human right, and efforts should be made to conscientise families of their rights. At St. Giles, a local disability rights organisation has conducted workshops for caregivers, teaching them about the available assistive technologies and their legal entitlements.

2.8. CHAPTER SUMMARY

This chapter has outlined the barriers and opportunities in the use of assistive technologies for the inclusion of children living with disabilities in primary education in Zimbabwe, with specific reference to St. Giles Primary School. Drawing on scholarly views, it has demonstrated that financial constraints, social stigma and discrimination, and technological limitations collectively create a formidable barrier to access. The chapter has also shown that children living with disabilities in Zimbabwe face severe limitations in accessing educational opportunities, with as many as 52 percent having no access to education at all. However, opportunities do exist through international collaborations, advocacy and awareness campaigns, and the integration of assistive technology into universal health and education systems.

CHAPTER THREE: RESEARCH METHODOLOGY

INTRODUCTION

This chapter details the methodological framework employed to investigate the barriers and opportunities for the use of assistive technologies (AT) for the inclusion of children living with disabilities in primary education in Zimbabwe. Specifically, the chapter describes the research approach, research design, study setting, target population, sampling methods, data collection techniques and instruments, data analysis procedures, ethical considerations, and limitations of the study. The study adopted a qualitative methodology, utilizing in-depth interviews to collect data from select

3.1. RESEARCH APPROACH

Research approaches are broadly categorized into three main types: qualitative, quantitative, and mixed methods. According to Creswell and Creswell (2024) , a research approach is a systematic plan for conducting research, shaped by the researcher's worldview and the nature of the research questions. For this study, the researcher adopted a qualitative research approach to address the research objectives. The qualitative approach enabled the collection of diverse responses and experiences, which in turn facilitated exploration of issues regarding access to assistive technology. Furthermore, qualitative research was best suited for this study because it allowed for in-depth exploration of topics and provided flexibility to uncover additional insights, as the research instruments were based on open-ended questions (Merriam and Tisdell, 2025) . This

flexibility and depth of understanding were central to addressing the study's objectives, making the qualitative approach the most appropriate for this research.

3.2. RESEARCH DESIGN

According to Khanday and Khanam (2023), a research design is defined as a framework of methods and techniques chosen by a researcher to combine various components of research in a logical manner so that the research problem is efficiently handled. The research design implemented for this study was a single case study design. This approach involved studying a single bounded system St Giles Primary School to gather diverse experiences and perspectives from teachers, therapists, children, and parents, making it an ideal strategy for achieving the research objectives (Yin, 2018). The single case study design was instrumental in providing an in-depth, contextualized understanding of the phenomenon. By exploring the experiences of multiple stakeholder groups within the same setting, the study gained a rich, holistic understanding that informed robust, practical recommendations. Yin (2018) reinforced that a single case study design is appropriate when the case represents a unique or critical case, allowing for deep exploration of a phenomenon within its real-life context. This depth of understanding was crucial for developing a comprehensive and nuanced insight into the complex process of AT integration at St Giles School.

3.3. STUDY SETTING

The study was conducted at St Giles Rehabilitation Centre and School, located in the Northern Central District of Harare Province, Zimbabwe. Established in 1957, St Giles is a Harare-based school focused on empowering students with diverse impairments in areas of their strengths, interests, and abilities. It is a non-profit organization and a cornerstone of specialized rehabilitation and education for children with physical and neurological disabilities in Zimbabwe, officially registered by Zimbabwe’s Ministry of Education. The school offered a unique and critical setting

for this research due to its specific mandate and population. It provides integrated services, combining primary education with physiotherapy, occupational therapy, and speech therapy, aligning perfectly with the holistic needs of children requiring assistive technology. The student body included children with a range of conditions, such as cerebral palsy, spina bifida, muscular dystrophy, and post-traumatic disabilities, who represented the primary beneficiaries of assistive technology interventions.

3.4. TARGET POPULATION

According to Makofane and Shirindi (2018), a target population encompasses all individuals who possess specific characteristics relevant to the purpose of the study and who can potentially be included as participants. The population of the current study comprised children living with disabilities at St Giles in Harare, along with their caregivers and rehabilitation professionals who were directly involved in the use and facilitation of assistive technologies. These caregivers and professionals served as the key informants of the study. This targeted population is of much importance because each group offers unique, essential perspectives that directly address the study's objectives. Children with disabilities are the primary end-users of assistive technologies and provide first-hand insights into device availability, daily usage difficulties, and the impact of AT on their learning and participation. Caregivers observe the child across home, transport, and community settings, enabling them to report practical barriers. Rehabilitation professionals, including physiotherapists, occupational therapists, and speech therapists, possess technical and clinical knowledge to identify which AT types are available, diagnose systemic barriers. Therefore, the inclusion of all three groups ensures a comprehensive, multi-perspective understanding of AT availability, barriers, and opportunities within primary education at St Giles in Harare

3.5. SAMPLING

Sampling forms a crucial aspect of any research process, as it determines who participates in a study and how representative the findings will be (Campbell, 2024) . According to Whittaker (2012), sampling refers to the procedure of identifying and selecting individuals who take part in

the research. Similarly, Makofane and Shirindi (2018) describe a sample as the group of participants chosen to contribute data to the study.

3.5.1 Sampling Procedure

The study adopted a non-probability sampling approach to ensure that participants were selected based on their relevance to the research objectives rather than through random selection. This method was appropriate because the study focused on a specific group of children living with disabilities and professionals directly involved in assistive technology integration, whose experiences and insights were central to addressing the research questions. Two sampling techniques were employed: convenience sampling and purposive sampling.

Convenience sampling was utilized to select children with disabilities who were accessible and available at St Giles during the period of data collection. This approach was suitable because the children were receiving rehabilitation and educational support within the institution, making them easily reachable and willing to participate with the assistance of their caregivers and institutional consent. Purposive sampling, on the other hand, was used to select key informants, including the social worker, occupational therapist, and physiotherapist. These individuals were deliberately chosen because of their expert knowledge, experience, and direct involvement in implementing assistive technologies at St Giles. Their inclusion ensured that the study obtained rich and relevant data concerning the integration process, challenges encountered, and the overall impact of assistive technologies on inclusion outcomes. This combination of sampling techniques allowed the researcher to capture both the lived experiences of children with disabilities and the professional perspectives of staff members, thereby ensuring a comprehensive understanding of how assistive technology contributes to inclusion at St Giles in Harare.

3.5.2 Sample Size

According to Makofane and Shirindi (2018), a sample refers to the group of individuals selected to participate in a study. In this research, the sample size consisted of twenty-five participants. The sample included children living with disabilities who were receiving educational support at St Giles School, as well as a small number of key informants drawn from professional staff such as the social worker, occupational therapist, physiotherapist, and special needs educator. Specifically,

the researcher selected a sample of 25 participants 5 special needs teachers, 3 administrators, 5 parents, 7 students, and 5 professionals (social worker, occupational therapist, physiotherapist one from each profession, with additional specialists included to reach five). The chosen sample size was considered sufficient to capture a diversity of perspectives and experiences related to the integration and use of assistive technologies in promoting inclusion among children with disabilities.

3.6. DATA COLLECTION TECHNIQUES

This study employed a qualitative research approach; therefore, data were collected through multiple techniques to ensure depth, diversity, and triangulation of information. The techniques used were semi-structured interviews, focus group discussions, and key informant interviews. These methods were selected because they allowed for in-depth exploration of participants' experiences, attitudes, and perceptions regarding the integration of assistive technology in promoting inclusion among children living with disabilities at St Giles in Harare.

3.6.1 Semi-Structured Interviews

Semi-structured interviews were conducted with parents and special needs teachers of children living with disabilities. This technique was most appropriate as it allowed the researcher to gain a deeper understanding. Interviews were conducted face-to-face within the St Giles premises in a quiet and comfortable environment to ensure privacy and openness. Semi-structured interviews enabled the researcher to build rapport with participants, encouraging honest and detailed responses. According to Seale (2016), this method allows flexibility in questioning and gives room to probe further into emerging themes. Similarly, DeJonckheere and Vaughn (2019) note that semi-structured interviews help researchers observe non-verbal cues such as facial expressions and body language, which enrich understanding of participant perspectives. However, semi-structured interviews can also present challenges such as lack of standardization and the possibility of participants digressing from the main topic (Kallio and colleagues, 2024) . To address this, the researcher used a clearly structured interview guide, redirected participants when necessary, and maintained professional composure and empathy throughout the interviews to ensure focus and quality data collection.

3.6.2 Focus Group Discussions

Focus group discussions (FGDs) were conducted with children with disabilities who were enrolled at St Giles. Each session involved small groups to accommodate communication needs, with special needs educators assisting children who had speech or cognitive difficulties. This technique was appropriate because it encouraged the exchange of multiple perspectives and promoted interactive dialogue among participants. According to Guest (2017), focus groups enable researchers to gather large amounts of data in a short time, capture diverse viewpoints, and stimulate participants to build on one another's ideas. This method allowed the researcher to understand the shared and differing experiences of children regarding access to and use of assistive technologies. Despite its strengths, focus group discussions can be influenced by social desirability bias and group dynamics, which may discourage some participants from expressing their true opinions (Ananian, 2024). To mitigate these challenges, the researcher established ground rules to promote respect and confidentiality, ensured equal participation, and moderated discussions sensitively to prevent dominance by certain participants.

3.6.3 Key Informant Interviews

Key informant interviews were conducted with professional staff members at St Giles, including a social worker, occupational therapist, and physiotherapist. These individuals were selected purposively due to their specialized knowledge and involvement in the implementation of assistive technology programs at the institution. As Patton (2015) asserts, this technique enables researchers to gain in-depth understanding from individuals with expertise on the subject matter. To minimize potential bias and ensure credible data, the researcher maintained neutrality, explained the purpose of the study to establish rapport, and triangulated responses across multiple informants. This enhanced the validity and reliability of the findings regarding the integration and challenges of assistive technology use at St Giles.

3.7. DATA COLLECTION INSTRUMENTS

Creswell and Creswell (2018) define data collection instruments as "the means by which researchers measure variables and collect information from participants in a study." A combination

of qualitative data collection instruments was employed to ensure a comprehensive understanding of how assistive technologies were being used to promote inclusive education.

3.7.1 Interview Guide

An interview is a face-to-face conversation between two people for the sole purpose of gathering information relevant to the research objectives. Interviews may be structured, semi-structured, or unstructured (Bryman, 2024) . For this study, a semi-structured interview guide was developed as the primary data collection instrument. It consisted of open-ended questions that explored participants' experiences, perceptions, and challenges related to the integration of assistive technology in inclusive classrooms. The purpose was to obtain in-depth insights from teachers, caregivers, and school administrators on how assistive technology supports children living with disabilities. The semi-structured interview guide ensured that all key topics such as types of assistive technologies used, training provided to teachers, and barriers to implementation were covered while allowing flexibility for participants to elaborate on their experiences.

3.7.2 Focus Group Discussion (FGD) Guide

Focus groups consist of small, guided discussions designed to explore participants' shared opinions, attitudes, and perceptions (Krueger & Casey, 2015). The study employed a focus group discussion guide as the instrument to facilitate group conversations among teachers and caregivers. The guide contained open-ended questions and prompts to stimulate dialogue around experiences, challenges, and strategies related to the use of assistive technology in inclusive education.

3.8. DATA COLLECTION PROCEDURE

The researcher sought and obtained approval to carry out the research from the St Giles school administration and Ministry of Primary and Secondary Education.

3.9 DATA ANALYSIS TECHNIQUE

Data analysis refers to the process of making sense of the responses the researcher has received as a result of using various methods of data generation (Flick, 2024) . Thematic analysis is the most typical example of data analysis in qualitative research. According to Maguire and

Delahunt (2017), thematic analysis is a process of identifying patterns or themes within qualitative data. It is a method of identifying, analyzing, and reporting patterns within qualitative data characterized by six key steps. These steps were noted by Braun and Clarke (2022) as follows: familiarizing oneself with the data, generating initial codes, searching for themes, reviewing themes, defining themes, and producing the final thematic map. This technique was ideal for this study, which aimed to integrate AT to strengthen the inclusion of children living with disabilities in primary education.

3.10 ETHICAL CONSIDERATIONS

Carrying out research on the barriers and opportunities in the use of assistive technologies for the inclusion of children living with disabilities in primary education in Zimbabwe implied sensitivity hence, social work ethics were taken into cognizance. This research aimed for excellence in ethical practice and therefore upheld research ethics which included voluntary informed consent, privacy and confidentiality, as well as the avoidance of harm to research participants.

3.10.1 Ethical Approval

The researcher obtained ethical approval from the relevant institutional review board and sought permission from the St Giles school administration and the Ministry of Education before commencing data collection. All participants were provided informed consent forms and assent was obtained from child participants in addition to parental consent. Participants were assured of their right to withdraw at any time without penalty. This research aimed for excellence in ethical practice and therefore it upheld research ethics which include voluntary informed consent, privacy and confidentiality as well, as the avoidance of harm to research participants.

3.10.2 Voluntary Informed Consent

The researcher applied the ethics of informed consent. Makofane and Shirindi (2018) defined informed consent as a hypothesis that explicitly explains the purpose of the study to the research participants. Therefore, this research continually inquired for the consent of the participants during the interviews. This is supported by Chilisa (2025) , who opines that informed consent enables participants to make an informed decision on whether to take part in the study or not,

emphasizing that in African research contexts, consent should be understood as a relational and ongoing process rather than a one-time event. The researcher explains first to the participants so that they understand before signing the consent forms. Informed consent is important because it would help in making sure that the researcher respects the rights of these participants and thus the participant would participate effectively and have the right to withdraw from the study at any point if they felt their privacy or confidentiality was being infringed upon.

3.10.3 Privacy and Confidentiality

According to Kang (2023), confidentiality is the practice of not revealing the identities of research participants, or the data that is collected about them, to any third party. The researcher used informed consent forms and this gave a guarantee to the participants that the study is being carried out in a highly ethical manner that ensures confidentiality. This is supported by Babbie (2016) who opines that only the researcher and probably the student's supervisor should be conscious of the identities of the respondents and be dedicated not to share with others. The researcher will confine all information concerning St Giles students and staff members.

3.10.4 Avoidance of Harm

According to Buchanan & Warwick (2021), harm refers to any foreseeable negative consequences that may be experienced by participants as a result of their participation in research. The researcher should therefore minimize and potential harm, both physical and psychological, that may result from their research. To avoid causing harm to the participants, the researcher adhered to the ethical principles and are responsible for identifying possible sources of harm and taking proactive steps to prevent them.

3.11 CHAPTER SUMMARY

This chapter focused on the research apporoach which includes the research design, target population, study setting, sampling method, data collection method, data analysis procedures, data collection techniques and ethical considerations. The next chapter will focus on the presentation and analysis of findings of the data collected.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

In the current chapter, the researcher presents, analyses, and discusses the research findings on the barriers and opportunities in the use of assistive technologies for the inclusion of children living with disabilities in primary education, using St. Giles Primary School in Harare, Zimbabwe as a case study. Interviews, key informant interviews, and focus group discussions with special needs teachers, administrators, parents, students, and rehabilitation professionals were used to collect data. The collected data was summarized and explored. This chapter also presents the findings of the semi structured interviews and focus group discussions in form of tables and inscribed text. The findings of this study will be articulated in relation to the literature review and theoretical framework so as to have an analysis and discussion that is comprehensive and well-articulated.

4.1 DEMOGRAPHICAL PROFILE OF PARTICIPANTS

This section provides an overview of the research participants' demographical information, presented in table format. This profile is crucial as it helps to contextualize the research findings and understand the participants' backgrounds.

4.1.1. Table: Demographical Details Of Keys Informants (Professionals)and Parents/Caregivers

Identity	**Sex**	**Experience**	**Role**	**Age**
Key Informant 1 (SW)	F	6 years	Social Worker	31 years
Key Informant 2 (OT)	F	8 years	Occupational Therapist	34 years
Key Informant 3 (PT)	M	10 years	Physiotherapist	42 years
Key informant (ADM1)	F	15 years	School Administrator	47 years
Key informant 5 (ADM2)	M	15 years	School Administrator	48 years

Key informant 6 (ADM3)	F	8 years	School Administrator	34 years
Parent 1	F	-	Parent/ Caregiver	34 years
Parent 2	F	-	Parent/ caregiver	38 years
Parent 3	F	-	Parent/ caregiver	41 years
Parent 4	M	-	Parent/ Caregiver	42 years

The demographic and professional characteristics of participants in this study offer a strategically valuable profile for examining assistive technology (AT) provision and inclusive education at St. Giles. The sample comprised six key informants (two males, four females) and five parents (two males, three females), with professional experience ranging from six to fifteen years and parent ages spanning 32 to 42 years. These characteristics are appropriate for this study's objectives and are broadly consistent with patterns documented in existing literature.

The gender distribution among key informants, with four females and two males, is justified by the nature of the professions represented. Social work, occupational therapy, and school administration the primary roles of key informants in this study are fields in which female practitioners predominate globally, particularly in special education and therapy services (Carrington et al., 2019). This reflects the reality of the educational and therapeutic workforce at St. Giles and ensures that the study captures authentic perspectives from the professionals most

directly involved in AT provision and inclusive education. Similarly, the higher number of female parent participants (three mothers, two fathers) is justified by research demonstrating that mothers continue to assume primary advocacy and caregiving roles for children with disabilities, particularly in school-based service meetings (Lazarus & Maughan, 2020). The presence of two male parents, however, is noteworthy and enriches the study by introducing diverse parental perspectives on AT decision-making (Carpenter & Towers, 2008).

The professional experience range of six to fifteen years among key informants is justified as it captures a breadth of expertise, from early-career professionals with recent training to experienced practitioners with deep institutional knowledge of AT provision at St. Giles. This diversity ensures that the study captures both current best practices and historical challenges in AT implementation. The parent age range of 32 to 42 years is appropriate as it represents caregivers in their active parenting years, with children likely in primary education, thereby making their insights directly relevant to the study's focus on primary school inclusive education.

The sample size of eleven participants (six key informants and five parents) is justified for a qualitative case study, as it enables in-depth, rich data collection while remaining manageable for thematic analysis. This is consistent with the recommendations of Braun and Clarke (2022), who note that in thematic analysis, sample size is less important than data richness and depth. The purposive selection of participants with direct experience in AT provision and inclusive education ensures that the study addresses its research objectives effectively.

The multidisciplinary composition of the key informants including a social worker, occupational therapist, physiotherapist, and three school administrators represents a methodological strength. Bunning et al. (2017) argue that successful AT implementation in inclusive schools depends on transdisciplinary teams where administrative support meets therapeutic input. The occupational and physiotherapists contribute clinical reasoning about child-environment-task fit, the social

worker provides knowledge of family systems and psychosocial barriers, and the administrators add organizational memory and resource allocation authority. However, the absence of classroom teachers or special educators is a notable limitation. Ok and Rao (2019) found that teacher-level beliefs and daily classroom routines are critical determinants of AT abandonment or sustained use, meaning that this study's findings may not fully capture implementation realities at the classroom level.

4.2. PRESENTATION OF DATA

This section presents data according to research questions. The overall purpose of this study was to investigate the barriers and opportunities in the use of assistive technologies for the inclusion of children living with disabilities in primary education at St. Giles Primary School in Harare, Zimbabwe. The data was then summarized using tables and distribution frequencies.

4.2.1 THEME ONE: AT THAT ARE CURRENTLY AVAILABLE FOR CHILDREN LIVING WITH DISABILITIES IN PRIMARY EDUCATION

4.2.1.2 Mobility and Positioning Devices

The findings revealed that mobility and positioning devices were the most common category of AT available at St. Giles, though significant shortages and appropriateness issues were identified. Participants described a range of devices including wheelchairs, walking frames, crutches, standing frames, and adaptive seating systems. However, availability did not automatically translate into usability, as several sub-themes emerged regarding the nature and limitations of current provision. Regarding this issue, Key Informant 3 (Physiotherapist) had this to say:

"We have a stock of standard wheelchairs, but most are adult-sized. We have approximately 15 wheelchairs for over 60 children who need them. We also have paediatric walkers about 8 of them and three standing frames. For orthotics, we can make basic ankle-foot orthoses on-site, but we

lack materials for more complex devices. The challenge is that many devices are second-hand donations, so they are not always the correct size or in good working condition."

On the same note, TCH-03 (Special Needs Teacher) voiced**:**

"*In my classroom of 12 children with physical disabilities, only 4 have wheelchairs that fit them properly. Two children share one walker because we do not have enough. The other children are carried by teaching assistants or crawl on the floor. This is not inclusion this is a health hazard and a dignity issue***."**

The same opinions were echoed by STU-04 (Student with cerebral palsy):

"*My wheelchair was given to me by an NGO last year. It is a good chair, but it is too big for my desk. I cannot get my legs under the table to write. I have to sit sideways or write standing up. The wheels are also not good for the gravel outside, so I get stuck often."*

Key Informant 6 (Administrator) expressed:

"*We have conducted internal assessments. For mobility devices, we meet approximately 40% of the need. For communication devices, we meet less than 10% of the need. For digital learning tools, we meet 0% of the need."*

The findings on mobility and positioning devices at St. Giles reveal a complex picture of provision that is simultaneously present yet inadequate. While the school possesses a range of mobility devices including wheelchairs, walking frames, crutches, standing frames, and adaptive seating systems, significant gaps exist between the number of devices available and the number of children who require them. The data indicates that mobility devices are the most commonly available category of AT at St. Giles, yet the supply meets only approximately 40% of the documented need. This finding is consistent with the broader national picture, where the Living Conditions Survey found that only 14.4% of individuals requiring assistive devices were actually using them (Zimbabwe National Statistics Agency, 2013).

Several critical issues emerged from the participant responses. Firstly, the quantitative shortage is severe, with Key Informant 3 (Physiotherapist) noting that the school has only 15 wheelchairs for over 60 children who need them. This 1:4 ratio means that the majority of children with mobility impairments lack appropriate devices, forcing them to rely on being carried or crawling, which compromises both their dignity and safety. Secondly, the appropriateness of available devices is problematic, with many being second-hand donations that are not correctly sized or in good working condition. This finding aligns with the World Health Organization's (2022) observation that in low-resource settings, donated devices often fail to meet the specific needs of users, leading to abandonment or ineffective use. Thirdly, the environmental context creates additional barriers, as STU-04's experience of getting stuck on gravel pathways illustrates the critical mismatch between device design and the physical environment in which children must navigate. The findings from this theme expose a persistent and troubling gap between Zimbabwe's progressive policy framework and the lived reality of children with disabilities at St. Giles. Despite Section 83 of the Zimbabwean Constitution guaranteeing assistive technology access for persons with disabilities (Government of Zimbabwe, 2013), and the recent launch of the National Strategy for Assistive Technology and Products Priority List (Ministry of Health and Child Care, 2024), the actual provision of mobility devices at St. Giles remains grossly inadequate. This disconnect between policy aspiration and implementation reflects what Magaracha and Sibanda (2025) describe as the "elusive" nature of AT implementation in Zimbabwe, where policies exist on paper but fail to translate into tangible improvements for children.

From the perspective of the social model of disability, the findings powerfully illustrate how society disables children through the absence of appropriate AT. According to Carmel, Chapman, and Wright (2025), it is society that disables children through systemic barriers, rather than their impairments themselves. In the case of St. Giles, children are disabled not by their physical conditions but by the lack of appropriately sized and functional mobility devices, inaccessible physical environments such as gravel pathways, and classroom furniture that cannot accommodate wheelchairs. STU-04's experience of being unable to get his legs under the desk to write is a stark illustration of how environmental barriers—not his impairment—create disability and limit educational participation.

The Complexity of AT Provision

The findings reveal that AT provision is not a simple matter of securing devices but involves a complex interplay of factors including device availability, appropriateness, maintenance, and environmental accessibility. The physiotherapist's observation that only basic orthotics can be produced on-site due to material shortages highlights the fragility of local AT production capacity. This is consistent with the National Assistive Technology Strategy (2024), which identified fragmented supply chains and limited technical capacity as key barriers to AT access in Zimbabwe (Ministry of Health and Child Care, 2024).

The reliance on second-hand donations as a primary source of devices presents particular challenges. While such donations represent a form of international solidarity, they often fail to meet local needs due to incorrect sizing, lack of spare parts, and limited durability. Lewis and colleagues (2025) note that donated devices are frequently abandoned because they do not fit properly, are culturally inappropriate, or cannot be maintained locally. At St. Giles, this is evident in the physiotherapist's comment that devices are "not always the correct size or in good working condition," which ultimately undermines their utility and may even cause harm through improper use.

Dignity and Safety Concerns

A particularly concerning finding is the impact of device shortages on children's dignity and safety. The special needs teacher's observation that children are "carried by teaching assistants or crawl on the floor" and her description of this as "not inclusion" but rather "a health hazard and a dignity issue" powerfully captures the human cost of inadequate AT provision. Being carried or crawling not only exposes children to physical injury but also reinforces their status as dependent and lesser, undermining their sense of self-worth and their peers' perceptions of them.

This aligns with the social model's emphasis on removing barriers to enable full participation. According to Berghs, Atkin, and Graham (2024), choice and autonomy are central to challenging the marginalisation and stigma that disabled children face. The inability to move independently within the classroom and school environment severely constrains children's autonomy, limits their participation in learning and play, and reinforces their exclusion from full membership in

the school community. As Johnson (2021) notes, stigma influences negative attitudes towards the use of assistive technology, but conversely, the visible absence of needed devices can also stigmatize children by marking them as different and less capable.

Training and Human Resource Considerations

The findings also highlight the critical role of trained personnel in AT provision. The physiotherapist's ability to produce basic orthotics on-site, albeit with material limitations, represents a valuable resource that could be further leveraged with adequate investment. However, the shortage of appropriate devices may also reflect a lack of comprehensive training in AT assessment and fitting among practitioners. This is consistent with the broader literature which identifies the shortage of trained personnel as a key barrier to AT access in developing countries (WHO, 2022; Moyo, 2023).

Teacher training is particularly crucial, as teachers are at the frontline of inclusive education. The special needs teacher's observation about the inadequacy of mobility device provision suggests that even with training, the fundamental shortage of devices limits what teachers can achieve. This finding supports UNICEF's (2021) observation that limited teacher training in inclusive education and insufficient provision of assistive learning devices continue to exclude children with disabilities from meaningful participation in schooling.

Urban-Rural and Institutional Context

It is important to contextualize the findings at St. Giles within the broader Zimbabwean context. St. Giles, as a specialist rehabilitation center and school located in Harare, represents a relatively resourced setting compared to mainstream schools in rural areas. If the AT situation at a center of excellence like St. Giles is inadequate, the situation in rural and less resourced schools is likely to be far worse. This reflects the urban-rural disparity noted by the Zimbabwe National Statistics Agency (2013), where AT access is disproportionately concentrated in urban areas.

The fact that even at St. Giles a school with dedicated physiotherapists, occupational therapists, and special needs teachers only 40% of mobility device needs are met is deeply concerning. It suggests that systemic factors beyond individual institutional capacity are at play, including inadequate government funding, fragmented supply chains, and limited domestic production

capacity. The National Assistive Technology Strategy (2024) acknowledges these challenges, noting that access to assistive products in Zimbabwe is hindered by high costs, weak regulatory frameworks, and inadequate domestic financing (Ministry of Health and Child Care, 2024).

4.2.1.3. Communication and Learning Devices

Participants reported that communication and learning devices were far less available than mobility devices, with significant gaps in both low-tech and high-tech solutions.

Key Informant 2 (Occupational Therapist) stated**:**

"*For communication, we have PECS books that we have made ourselves using laminated pictures and velcro. We also have two basic 'talk pads' devices that play pre-recorded messages when a button is pressed. These were donated by a South African NGO three years ago. One is broken, and the other is used by three different children on a rotating schedule. For children with no functional speech, this is completely inadequate."*

TCH-01 (Special Needs Teacher) added:

"We have one old braille writer for the whole school, shared between three children with visual impairment. We have no braille paper we use thick cardboard instead. For children who cannot write, we rely on oral responses or having a teaching assistant scribe for them. This means these children cannot work independently."

STU-02 (Student with communication impairment) shared:

"I have a book with pictures. When I want to say something, I point to a picture. But many words are not in the book. When I try to tell the teacher something new, she gets frustrated. I used to have a talk pad that said words out loud, but it broke. They said they will fix it, but it has been one year. Now I just stay quiet most of the time."

Key Informant 1 (Social Worker) highlighted the safeguarding dimension:

*"The lack of communication devices is not just a learning issue it is a safeguarding issue. Children who cannot communicate effectively cannot report abuse, cannot tell us when they are in pain, cannot express their needs. We have had cases where a child was sick for three days before anyone realized because they could not say 'I have a headache.' This is a failure of the system, not the child.***"**

Findings align with the Social Model of Disability, which argues that disability is created when environmental barriers in this case, poorly fitted, insufficient, or broken assistive technology prevent full participation (Shakespeare, 2018). According to Higgins (2020) structural barrier describes how people living with disabilities are psychologically disabled through social and physical exclusion, school exclusion .Furthermore, the lack of appropriate communication devices extends beyond education to become a safeguarding issue, as children unable to express pain or abuse remain invisible (Light & McNaughton, 2014). Internationally, research has consistently shown that low- and middle-income countries face similar challenges, where over-reliance on donated, ill-fitting equipment and inadequate investment in digital and augmentative communication technologies perpetuate exclusion (World Health Organization, 2022). Therefore, addressing both the quantity and appropriateness of assistive technology, alongside systematic repair and maintenance mechanisms, is essential for meaningful educational inclusion at St. Giles Primary School**.**

4.3. THEME TWO WHAT BARRIERS ARE FACED BY CHILDREN LIVING WITH DISABILITY IN THE USE OF AT IN PRIMARY EDUCATION IN HARARE

4.3.2. Financial Barriers

Financial constraints were universally cited as the most significant barrier by all 25 participants. These barriers encompass not only the high purchase costs of assistive devices but also recurring expenses, maintenance, and opportunity costs for families. Without adequate funding mechanisms whether through government subsidies, insurance, or NGO support most families remain unable to acquire or sustain AT for their children

PRN-01 (Parent) stated:

“Kuchipatara vakati mwana wangu anoda cheya yemhando yake ega pakugeza ne chekumirisa chake ega. Zvese izvi zvinoda mari yakawanda kupfuura mari inotambirwa nemurume wangu. Tinotonetseka nekutenga chikafu uye mari yechikoro. Hapana patingatenge chekufambisa chemhando yake pachinhambo chekutenga chikafu.”

"At the hospital, they said my child needs a special bath chair and a special standing frame. All of this costs more than my husband's salary. We struggle just to buy food and pay school fees. We cannot buy a mobility device when we have to choose between that and food.”

Key Informant 1 (Social Worker) explained:

"*There is no government funding for AT for individual children. The Disabled Persons Fund exists on paper, but we have never successfully accessed it. NGOs sometimes provide devices, but their support is inconsistent. One year they give 10 wheelchairs; the next year, nothing*."

Key Informant 3 (Physiotherapist) highlighted hidden costs:

"*People think that providing a device is a one-time cost. It is not. Devices need maintenance. Tyres wear out. Batteries need replacement. Children grow and need new sizes. Families cannot afford this. The school cannot afford this*." The findings on mobility and positioning devices at St. Giles reveal a complex picture of provision that is simultaneously present yet inadequate. While the school possesses a range of mobility devices including wheelchairs, walking frames, crutches, standing frames, and adaptive seating systems, significant gaps exist between the number of devices available and the number of children who require them. The data indicates that mobility devices are the most commonly available category of AT at St. Giles, yet the supply meets only approximately 40% of the documented need. This finding is consistent with the broader national picture, where the Living Conditions Survey found that only 14.4% of individuals requiring assistive devices were actually using them (Zimbabwe National Statistics Agency, 2013).

Several critical issues emerged from the participant responses. Firstly, the quantitative shortage is severe, with Key Informant 3 (Physiotherapist) noting that the school has only 15 wheelchairs for over 60 children who need them. This 1:4 ratio means that the majority of children with mobility impairments lack appropriate devices, forcing them to rely on being carried or crawling, which compromises both their dignity and safety. Secondly, the appropriateness of available

devices is problematic, with many being second-hand donations that are not correctly sized or in good working condition. This finding aligns with the World Health Organization's (2022) observation that in low-resource settings, donated devices often fail to meet the specific needs of users, leading to abandonment or ineffective use. Thirdly, the environmental context creates additional barriers, as STU-04's experience of getting stuck on gravel pathways illustrates the critical mismatch between device design and the physical environment in which children must navigate.

Financial constraints emerged as the most pervasive and formidable barrier to assistive technology access at St. Giles, cited universally by all 25 participants. The findings reveal that financial barriers operate at multiple levels: the prohibitive upfront costs of devices, ongoing maintenance expenses, replacement costs as children grow, and the opportunity costs for families forced to choose between AT and basic necessities such as food and school fees. The absence of sustainable government funding mechanisms, coupled with inconsistent NGO support, creates a cycle of dependency and uncertainty that leaves most families unable to acquire or sustain appropriate AT for their children. The data exposes a stark reality: even at a specialist institution like St. Giles, economic constraints fundamentally undermine the constitutional and policy commitments to AT access for children with disabilities in Zimbabwe.

4.3.3. Technological Barriers

Technological barriers emerged as the second most frequently cited category of obstacles. These include the lack of on-site repair services, unreliable power supply for charging devices, and inappropriate design of imported AT for local environmental conditions. Even when devices are available, technological incompatibilities and maintenance gaps render them unusable over time

Key Informant 3 (Physiotherapist) stated:

"*We have no technician on staff. There is no government technician assigned to our school. There is no private repair service for AT in Harare. When a device breaks, we have three options: try to fix it ourselves (which rarely works), send it to the hospital (3-6 months wait), or put it in the storeroom. Most devices go to the storeroom.*"

TCH-03 (Teacher) described power supply issues:

"We have one speech-generating tablet for the school. But we have load-shedding several times a week. We cannot charge the tablet consistently. When the battery dies, the device becomes a very expensive paperweight."

Key Informant 2 (Occupational Therapist) addressed inappropriate design:

"*Most AT is designed in wealthy countries for users in wealthy countries. The wheelchairs have smooth, small wheels that work on paved sidewalks. Our paths are gravel and dirt. The wheels jam or puncture within weeks. We need rugged, low-tech, locally designed solutions*."

A striking finding from this theme is the complete absence of systematic repair and maintenance services for assistive technology at St. Giles and in the broader Harare context. Key Informant 3's observation that "we have no technician on staff" and "there is no private repair service for AT in Harare" exposes a critical gap in the AT ecosystem that fundamentally undermines the sustainability of device provision. When devices break as they inevitably do through normal use the lack of repair options means that devices are either abandoned or sent to hospitals with waiting times of three to six months. The consequence, as the physiotherapist noted, is that "most devices go to the storeroom," representing wasted investment and lost opportunity for children who need them.

This maintenance gap reflects a broader challenge in AT provision in low and middle-income countries, where the focus is frequently on the initial distribution of devices without adequate attention to the ongoing support required for sustained use (WHO, 2022). Lewis and colleagues (2025) note that device abandonment is a widespread problem globally, with estimates suggesting that up to one-third of assistive devices are abandoned within the first year of provision. The primary reasons for abandonment include lack of maintenance, device breakdown, and inadequate training all factors that are evident in the St. Giles data. The absence of repair services thus represents not merely a logistical inconvenience but a systemic failure that wastes scarce resources and denies children the benefits of the devices they receive.

The social model of disability provides a lens for understanding this challenge. From the social model perspective, the maintenance gap is a form of structural disablement. Society disables children with disabilities not by their impairments but by creating systems that fail to support the ongoing use of AT. As Carmel, Chapman, and Wright (2025) argue, disability is produced by the interaction between a child's body and societal barriers. In the case of St. Giles, the absence of repair services transforms functional devices into unusable objects, creating a barrier that is entirely socially constructed rather than inherent to the child's impairment. The devices themselves are not the problem; the lack of infrastructure to maintain them is.

Power Supply Challenges

The issue of inconsistent electricity supply emerged as a significant technological barrier, with teachers describing how load-shedding several times a week makes it impossible to charge speech-generating tablets and other electronic devices consistently. TCH-03's vivid description of the tablet becoming "a very expensive paperweight" when the battery dies powerfully illustrates how unreliable power infrastructure negates the benefits of electronic AT. This finding is particularly concerning given the growing emphasis on digital learning tools in inclusive education and the National Assistive Technology Strategy's (2024) commitment to providing digital devices such as braille displays and magnifiers.

The power supply challenge is not unique to Zimbabwe but reflects a broader infrastructure gap in many low and middle-income countries. The World Health Organization (2022) notes that unreliable electricity supply is a significant barrier to the adoption and sustained use of electronic assistive devices in many parts of the world. For children with disabilities who depend on speech-generating devices, hearing aids with rechargeable batteries, or tablets for communication and learning, power instability represents a critical barrier to participation and inclusion.

The implications of this finding extend beyond individual frustration to fundamental questions about educational inclusion. In the 21st century, participation in education increasingly depends on access to digital technologies and the power required to operate them. When schools lack reliable electricity, children who depend on digital AT are systematically excluded from learning opportunities that their peers take for granted. This technological barrier thus reinforces existing inequalities, creating what Wang and Qi (2024) describe as a "digital divide" that exacerbates educational exclusion for children with disabilities.

Inappropriate Design and the Local Context

The third major sub-theme concerns the inappropriate design of imported assistive devices for local environmental conditions. Key Informant 2's observation that wheelchairs designed in wealthy countries have "smooth, small wheels that work on paved sidewalks" but jam or puncture "within weeks" on Zimbabwe's gravel and dirt paths highlights a critical mismatch between product design and local reality. This finding resonates with broader critiques of the global AT industry, which is dominated by manufacturers in high-income countries whose products are designed for environments with paved roads, reliable electricity, and accessible infrastructure.

This environmental mismatch has profound implications for the effectiveness of AT provision. Devices that are inappropriate for local conditions not only fail to meet the needs of users but can also cause harm. Wheelchair users on unpaved paths may become stuck, fall, or injure themselves. Devices that are unsuitable for the local climate may degrade rapidly. The reliance on imported AT also perpetuates dependency, as repairs require parts that are not locally available and technicians who do not exist in the country.

The call by Key Informant 2 for "rugged, low-tech, locally designed solutions" points toward an alternative approach to AT provision that emphasizes local production, appropriate technology, and design adapted to local conditions. This approach aligns with the principles of the National Assistive Technology Strategy (2024), which identifies the strengthening of domestic technical capacity and local production as priorities. However, moving from aspiration to implementation requires investment in local manufacturing capacity, training for technicians, and support for innovation and entrepreneurship.

The Problem of Donation-Driven Provision

The technological barriers identified in this theme are closely linked to the donation-driven model of AT provision that prevails at St. Giles and across Zimbabwe. Devices provided through international donations are frequently selected without adequate consideration of local conditions, maintenance requirements, or the availability of spare parts. This results in devices that are technologically appropriate in their countries of origin but become liabilities when imported into settings without the necessary support infrastructure.

Research by Puli, Harniss, and colleagues (2024) notes that donated assistive devices are frequently abandoned due to lack of compatibility, missing parts, and the absence of local repair options. The World Health Organization (2022) recommends that AT provision should be accompanied by comprehensive support, including training for users and service providers, clear protocols for maintenance and repair, and referral pathways for ongoing support. However, these recommendations are rarely implemented in practice, particularly in resource-constrained settings.

The donation-driven model also creates a cycle of dependency that undermines long-term sustainability. When devices are provided as donations, there is no financial mechanism to support maintenance or replacement. Families and schools cannot afford to repair devices that break, and NGOs often do not include maintenance in their project budgets. This creates a situation where children receive devices that work for a short period and then fail, often without the user ever having benefited fully from their use.

Environmental Accessibility and Universal Design

The design mismatch identified by participants points to the broader challenge of environmental accessibility. The gravel paths that damage wheelchair wheels are not just a problem for AT but represent a fundamental environmental barrier that makes school and community spaces inaccessible. This highlights the need for a dual approach: both adapting the environment to be more accessible and adapting AT to be more robust and context-appropriate.

The principles of Universal Design offer a framework for addressing this challenge. Universal Design calls for products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design (Mace, 1985). Applying these principles to the Zimbabwean context would mean designing school environments that are accessible to children with diverse mobility needs and procuring or producing devices that can function effectively in local conditions. This approach moves beyond the individual focus of AT provision to address the broader environmental and social barriers that create disability.

4.3.4. Systemic and Bureaucratic Difficulties

Systemic and bureaucratic barriers refer to the complex, multi-step procedures embedded within government and institutional structures that delay or deny AT access. Participants described long assessment queues, infrequent panel meetings, multiple ministry approvals, and excessive waiting periods ranging from 8 to 18 months. These processes, intended to regulate provision, instead function as gatekeeping mechanisms.

Key Informant 1 (Social Worker) described the bureaucratic maze:

"*To get a government-provided device, here is the process firstly a doctor at a central hospital must assess the child, the prescription goes to a provincial rehabilitation panel that meets quarterly then to the Ministry of Health, then to the Ministry of Public Service, then the device is ordered, then the family travels to collect it. The entire process takes 8-18 months. In that time, the child may have grown or the family may have given up. This is not access. This is a barrier disguised as a system*." The testimony provided by Key Informant 1 powerfully illustrates a central paradox in AT provision: the very systems designed to ensure equitable access often

become the primary obstacles to it. The discussion of these findings must move beyond a simple identification of "red tape" to analyze how these bureaucratic structures function as de facto gatekeeping mechanisms, and what their real-world consequences are for children with disabilities and their families.

1. The Architecture of the Barrier: A Multi-Stage Process

The description of the process reveals a system with a high degree of complexity and fragmentation. It requires sequential approval from multiple, often disconnected, entities: a central hospital, a provincial panel, and two separate ministries (Health and Public Service). This is not a single point of failure but a chain of potential delays.

Fragmentation: The need for multiple ministerial approvals indicates a lack of inter-departmental coordination. This suggests that AT is not viewed as a seamless, integrated service but as a resource to be tightly controlled, moving through a complex financial and administrative labyrinth.

Infrequent Decision-Making: The provincial panel meeting only quarterly is a critical bottleneck. This rigid schedule means that a child’s fate is tied to a calendar, not their immediate needs. A delay in one step can lead to a three-month wait for the next, effectively freezing the process.

Centralized Assessment: Requiring a single doctor at a central hospital to conduct the initial assessment concentrates expertise but also creates a severe capacity issue. Long queues are inevitable, representing the very first and most significant hurdle for families. The remote location of such a hospital also adds a significant logistical and financial burden (travel costs) even before the bureaucratic process begins.

2. The Human Cost: Time as a Non-Renewable Resource

The most damning critique in the text is the timeframe: **8 to 18 months.** This statistic reframes the issue from one of administrative inefficiency to one of profound human cost.

The "Moving Target" Problem: For a child, 8 to 18 months represents a significant period of growth and development. As the Key Informant notes, a device prescribed for a young child may be physically obsolete by the time it arrives. A wheelchair for a 5-year-old will not fit an 8-year-old. This not only wastes public resources but also fails the child, potentially causing discomfort, injury, and hindering the very development the device was meant to support.

Erosion of Trust and Hope: The statement " or the family may have given up" is a stark admission of the psychological impact. This process requires immense perseverance and advocacy from families who are often already exhausted and financially strained. The bureaucratic maze tests their resolve to the point of surrender, denying the child access not because a device doesn't exist, but because the system is too arduous to navigate. This creates a form of "self-selection" where only the most resilient families succeed, undermining the principle of universal access.

Lost Developmental Windows: The delay directly impacts the child's developmental potential. Early intervention is critical; a delay of over a year in receiving a mobility aid, communication device, or hearing aid can mean a permanent loss of opportunity for cognitive and social development. The system is not just inefficient; it is actively detrimental to the child's long-term outcomes.

4.3.5. **Social and Attitudinal Barriers**

Social and attitudinal barriers arise from stigma, discrimination, and negative beliefs held by peers, community members, and sometimes educators. Children with disabilities reported being teased, isolated, physically avoided, and made to feel unwelcome at school. Parents also described community shame and fear of gossip, which discouraged them from seeking AT or even sending their children to school.

STUDENT 05 (Student with hearing impairment) shared:“*Vamwe vana vanondinyeya vachiti uyu haanzwe chinhu pamwe vachiti hatidi kutamba naye bhora nekuti haunzwe zvatinenge tichida ndavakuchipfeka kuchikoro chete*.”

"*Other children point at me saying “this one hears nothing” and sometimes they say “we don't want to play ball with him because he cannot hear what we want” and I only wear my device at school."*

STUDENT 7 added:

"*Vana vanondibata nzeve ndichipfuura vachiti bofu. Vanotora bhuku rangu ndokundivanza. Vamwe vanoti haafanire kuva pano nekuti haaone. Mudzidzisi anonditsigira asi haakwanise kundidzivirira nguva dzose. Ndinoziva kuti handibofu asi vana vanondiita kuti ndinzwe sendiri chirema. Ndinoda kuenda kuchikoro asi ndinotya vana*."

"*Children touch my ears as I pass by, calling me blind. They take my book and hide it. Others say I should not be here because I cannot see. The teacher supports me but cannot protect me all the time. I know I am not blind, but the children make me feel like a cripple. I want to go to school, but I am afraid of the children."*

STUDENT 6 shared that

"*Asi vamwe vana vachiri kundituka kunze kwekirasi vanoti chero ukamira hausati wakafanana nesu. Vanoramba kundibata mumaoko.*

"But some children still insult me outside the classroom. They say even if you stand, you are still not like us. They refuse to hold my hands.”

PRN-03 (Parent) stated:

“*Ndinoda zvakanaka pamwana wangu asindinotya kutaura pajekerere kutsvaga rukumbiro sezvo vanhu vemunharaunda vachiti kuremara zvine munyama mukati, nekutya zvinotaura vanhu, mwana wangu anoswera hake pamba kana mumba*”

"I want what is good for my child, but I am afraid to speak openly or seek help because people in the community say that disability has something shameful inside. Because I fear what people say, my child just stays at home, inside the house."

During FGDs, children with disabilities complained of being quarantined, jeered at, and isolated. One girl lamented that other students stare at them, ridicule them, and no one likes to play with them. Such sentiments are shared by Moola, Lawson, and colleagues (2025) , who found that for children with disabilities who experience peer rejection and social exclusion, school becomes a site of profound emotional distress, with negative social interactions significantly impacting their sense of belonging, self-worth, and overall well-being.

4.3.6. Knowledge and Training Gaps

Knowledge and training gaps refer to the lack of awareness, skills, and practical competencies among teachers, parents, and caregivers regarding AT use, maintenance, and troubleshooting. Teachers reported receiving no hands-on training on specific devices, while parents particularly those with low literacy expressed uncertainty about how to operate or advocate for AT. These gaps lead to device abandonment and reduced educational participation

TCH-02 (Teacher) admitted:

"*I received training on inclusive education, but nothing specific on how to use or maintain communication devices. When the talk pad broke, I had no idea how to fix it. I felt useless. The child looked at me expecting help, and I could do nothing*."

PRN-05 (Parent) stated:

"*Handigone kunyora uye kuverenga saka izvi zvemushini dzekufambisa handitozive kuti zvinotsvaga sei ndinongoziva wheelchair. Nekuda kweizvozvo zvinondiita ndive neruzivo rwushoma kuitira mwana wangu*."

The findings from St. Giles Primary School reveal that stakeholders perceive assistive technology as fundamentally transformative, functioning as a gateway to participation, dignity, and educational inclusion. These perceptions align with the Social Model of Disability, which positions AT as a tool that removes environmental barriers, thereby transforming disability from an individual impairment into a surmountable obstacle according to Oliver (2013). However, a strong counter-theme emerged regarding the burden of unreliable and inappropriate AT. The

physiotherapist noted that a storeroom contains at least 15 broken wheelchairs, 8 walkers, and 3 communication devices. This finding is consistent with Scherer (2022) argues that "inappropriate or poorly maintained AT leads to device abandonment, loss of function, and diminished quality of life." The primary barriers to effective AT use at St. Giles were financial, technological, systemic, attitudinal, and knowledge-related. Financial constraints were universally cited as the most significant barrier. Systemic and bureaucratic difficulties further compound the problem, with the social worker describing an 8-to-18-month process requiring multiple government departments before a child receives a device. This aligns with findings by Matter (2017) who documented that in low-resource settings, complex procurement systems and lack of coordinated referral pathways are among the most persistent barriers to AT access. Attitudinal barriers also emerged and finally, knowledge and training gaps among teachers and parents emerged as a barrier. According to Borg, Lindström and Larsson (2011), inadequate training for both users and service providers is a leading cause of AT underutilization and abandonment, particularly in low- and middle-income countries. Therefore, to achieve meaningful educational inclusion at St. Giles, interventions must address not only the provision of devices but also sustainable repair systems, simplified procurement processes, community attitudinal change, and structured training for all stakeholders in AT use and maintenance.

4.4 THEME THREE: HOW THE BARRIERS ARE AFFECTING CHILDREN'S PARTICIPATION IN EDUCATIONAL ACTIVITIES

This section addresses how the barriers encountered by children with disabilities are affecting their participation in everyday educational activities. The findings reveal that financial, technological, systemic, social, and knowledge-related barriers do not merely inconvenience children they actively exclude them from meaningful learning, social interaction, and developmental opportunities. The following sub-sections present participant narratives illustrating these impacts.

4.4.1. Restricted ability to participate in reading and writing

Reading and writing are foundational to primary education, yet children with disabilities face severe restrictions in these areas due to lack of appropriate AT. Students with visual impairments shared that limited access to braille writers forces them to wait days for their turn, while teachers

described how the absence of text-to-speech software prevents students with dyslexia from reading independently. These barriers lead to falling behind academically and diminishing motivation to learn.

STU-07 (Student with visual impairment) stated:

"*We have one braille writer for three of us. I only get to use it on Tuesdays. On other days, I listen and try to remember. But when the teacher writes on the board, I cannot see it. I just sit and wait for someone to tell me what it says. I am falling behind*."

TCH-01 (Teacher) explained:

"*Without text-to-speech software, my student with dyslexia cannot read independently. Every text has to be read aloud to her. This takes time, and she feels embarrassed. She has stopped trying to read on her own*." Reading and writing are foundational to primary education, yet the findings from this study reveal that children with disabilities at St. Giles face severe restrictions in these areas due to the lack of appropriate assistive technology. Students with visual impairments described limited access to braille writers, forcing them to wait days for their turn, while teachers explained how the absence of text-to-speech software prevents students with dyslexia from reading independently. These barriers have profound consequences: children fall behind academically, lose motivation to learn, and experience embarrassment and frustration that undermine their educational participation. The findings expose a critical gap in AT provision that fundamentally compromises the goal of inclusive education at St. Giles.

The Braille Writer Shortage: A Case Study in Resource Scarcity

The experience of STU-07, who has access to one braille writer shared among three students and can only use it on Tuesdays, powerfully illustrates the consequences of AT scarcity. For the rest of the week, this student "listen[s] and try[ies] to remember" but cannot see what the teacher writes on the board, forcing them to "just sit and wait for someone to tell [them] what it says." This is not education; it is exclusion masquerading as attendance.

From the perspective of the social model of disability, the braille writer shortage represents a form of structural disablement. As Carmel, Chapman, and Wright (2025) argue, it is society that disables children through systemic barriers. In this case, the child with visual impairment is disabled not by their condition but by the absence of the technology needed to access the curriculum. The one-braille-writer-for-three-students ratio ensures that two-thirds of the time, students with visual impairments are denied the tools necessary for independent learning. They are reduced to passive observers in their own education, dependent on others for access to information that their sighted peers can access independently.

The impact of this scarcity extends beyond academic learning to the development of essential literacy skills. Reading and writing are not merely academic exercises but foundational competencies that enable participation in education, employment, and community life. When children with visual impairments cannot access braille writers consistently, they are denied the opportunity to develop literacy skills at the same pace as their peers. This creates a cumulative disadvantage: each day without access to braille widens the gap between these students and their sighted peers, making it increasingly difficult to catch up.

This finding is consistent with research by Hollier and Murray (2014), who noted that the rapid take-up of personal computers in the 1980s provided unprecedented educational opportunities through technologies such as voice synthesizers, but that challenges around cost and platform choice remained significant. Decades later, the situation at St. Giles suggests that these challenges persist, with children in low-resource settings still lacking access to the technologies that have become standard in wealthy countries.

The Digital Divide and Dyslexia

The absence of text-to-speech software for students with dyslexia, as described by TCH-01, represents another manifestation of the digital divide that excludes children with disabilities from meaningful educational participation. The teacher's observation that a student with dyslexia "cannot read independently" because "every text has to be read aloud to her" reveals how the lack of appropriate AT creates dependency and embarrassment, ultimately leading the student to "stop[ ] trying to read on her own."

The impact of this barrier on the student's motivation and self-esteem is particularly concerning. The teacher notes that the student "feels embarrassed" by the need to have texts read aloud, which is understandable given the emphasis on independent reading in primary education. This embarrassment, combined with the frustration of dependence, leads to withdrawal from learning. The student stops trying to read independently, which further widens the gap between her and her peers. This finding aligns with Rose, Espelage, and Monda-Amaya's (2024) observation that children with disabilities who experience learning difficulties frequently develop negative self-perceptions and diminished academic motivation, which in turn reinforce their exclusion from educational opportunities.

From the social model perspective, the absence of text-to-speech software creates a barrier that is entirely socially constructed. The student's dyslexia is not the problem; the problem is that the educational system has not provided the technology needed for her to read independently. In a well-resourced system, text-to-speech software is a standard accommodation that enables students with reading difficulties to access the curriculum on an equal basis with their peers. At St. Giles, the absence of this basic technology creates a barrier that disables the student and excludes her from independent learning.

The Cumulative Impact of Reading and Writing Barriers

The findings reveal that reading and writing barriers have a cumulative impact on children's educational outcomes and well-being. The student who can only use a braille writer on Tuesdays, and the student who has no text-to-speech software, are falling behind academically. They are

learning less, practicing less, and developing literacy skills more slowly than their peers. Each day without appropriate AT widens the gap, making it increasingly difficult to catch up.

This cumulative disadvantage is compounded by the social and emotional consequences of exclusion. The student with visual impairment who must wait for someone to tell them what the teacher has written on the board experiences not just academic delay but social exclusion. The student with dyslexia who has stopped trying to read independently is withdrawing from learning, losing motivation, and potentially developing negative self-perceptions that will persist beyond primary education.

This finding is consistent with research by Wang and Qi (2024), who found that the "digital divide" exacerbates educational inequalities for children with disabilities, severely constraining their ability to participate in classroom activities on an equal basis with peers. The lack of braille writers and text-to-speech software at St. Giles represents a critical dimension of this divide, which excludes children with disabilities from the literacy practices that are foundational to educational success.

Environmental and Systemic Factors

The reading and writing barriers identified in this theme are not isolated problems but reflect broader environmental and systemic factors. The one-braille-writer-for-three-students ratio reflects the severe resource constraints that characterize AT provision at St. Giles and across Zimbabwe. As Key Informant 6 (Administrator) noted in the findings on mobility devices, "for digital learning tools, we meet 0% of the need." This 0% figure for digital learning tools is confirmed by the absence of text-to-speech software in classrooms.

The lack of digital learning tools is not simply a matter of insufficient procurement budgets but reflects broader systemic challenges. The National Assistive Technology Strategy (2024) identifies digital AT as a priority, but implementation remains severely constrained by limited

domestic financing, fragmented supply chains, and weak regulatory frameworks (Ministry of Health and Child Care, 2024). The absence of text-to-speech software at St. Giles suggests that the strategy's commitment to digital AT has not yet translated into tangible improvements for students.

The findings also raise questions about teacher training and capacity. While TCH-01 recognizes the need for text-to-speech software for her student with dyslexia, the teacher does not have access to this technology and cannot provide it independently. This highlights the importance of systemic solutions rather than relying on individual teachers to address AT gaps. As UNICEF (2021) noted, limited teacher training in inclusive education and insufficient provision of assistive learning devices continue to exclude children with disabilities from meaningful participation in schooling.

4.4.2. Limited Participation in Classroom Interactions

Classroom interactions including answering questions, participating in discussions, and engaging with teachers are essential for learning and social development. However, children with communication impairments reported that the pace of the classroom does not accommodate their needs. By the time they use their communication boards or picture books, other children have already responded. Teachers acknowledged that the system is not designed for children who need more time to communicate, leading these students to stop trying altogether.

STU-02 (Student with communication impairment) shared:

"*When the teacher asks a question, I know the answer. But by the time I point to the pictures in my book, other children have already shouted the answer. The teacher does not wait for me. So I have stopped trying to answer*."

TCH-04 (Teacher) acknowledged:

"I admit that I sometimes forget to wait for the child with the communication board. The pace of the class is fast, and I have 15 other children. But I know this is not fair. The system is not designed for children who need more time to communicate."

4.4.4. Exclusion from Play-Based Learning

Play-based learning is a critical component of primary education, promoting physical, social, and cognitive development. However, children with mobility impairments described being excluded from playground activities such as soccer. Even when a walker is available, uneven terrain makes play impossible. Parents added that without appropriate mobility devices, their children either stay indoors or play alone, missing the essential social learning that occurs through peer play.

STU-03 (Student with spina bifida) stated:

"*During playtime, I want to play soccer with my friends. But without my walker, I cannot run. Even with my walker, the field is too bumpy. So I sit on the bench and watch*."

PRN-02 (Parent) added:

"*Mwana wangu haana mukana wekutamba nevezera rake nekuda kwekuti handikwanise kutenga zvekufambisa kwakwe. Anoswera mumba kana kuatamba nevanenge vapinda mumba kana kutamba ega.*"

"My child has no opportunity to play with peers of their own age because I cannot afford mobility devices for them. They spend all day at home, or they play only with people who come into the house, or they play alone."

4.4.5. Limited Access to Educational Opportunities

Educational opportunities extend beyond daily classroom activities to include grade progression, consistent attendance, and long-term academic trajectories. Participants shared devastating accounts of children missing years of schooling because of a single broken wheelchair or the lack

of an appropriately sized device. One student reported being two grades behind peers due to AT-related absences. Administrators confirmed that months of lost education translate into widening gaps that become increasingly difficult to close.

STU-04 (Student) shared:

"*Ndaifana kunge ndava mu grade 6 asi ndiri grade 4 nekuda kwekushaikwa kwe wheelchair inopindirana neni, ndaisakwanisa kusvika ku classroom handikuuya kuchikoro kwemakore maviri. Izvezvi ndini munhu mukuru mu class mangu*."

"I was supposed to be in Grade 6, but I am in Grade 4 because of the lack of a wheelchair that fits me. I could not reach the classroom. I did not come to school for two years. Now I am the oldest person in my class."

Key Informant 4 (Administrator) stated:

"*We have had cases where children were kept at home for months because their only wheelchair broke and the family could not afford a repair. These are months of education lost. Months of social interaction lost. The gap widens every day*."

4.4.6. Reduced ability to perform Self-Care activities at school

Self-care activities including feeding, toileting, and personal hygiene are fundamental to dignity and independence in the school environment. Teachers reported that children without adapted utensils cannot feed themselves and must rely on assistance from staff. This not only consumes limited teacher time but also reduces the child's sense of autonomy and self-worth. With appropriate AT, participants noted, these children could perform self-care activities independently, like their peers.

TCH-05 (Teacher) added:

"We have children who cannot feed themselves because they lack adapted utensils. They have to be fed by being assisted. This takes time and reduces their dignity. With the right devices, they could feed themselves like everyone else."

TCH-02 (Teacher) confirmed:

"*I have a child with cerebral palsy in my class who cannot hold a standard spoon. Every lunchtime, either I or an aide must feed her. Meanwhile, the other children finish eating and go out to play. She sits alone, waiting. An adapted spoon with a thicker, angled handle would cost very little, but we do not have one. That is not fairness. That is a barrier we could remove tomorrow*."

The findings reveal that barriers to accessing assistive technology at St. Giles Primary School profoundly restrict children's participation across multiple domains of educational activity, including reading and writing, classroom interactions, play-based learning, educational progression, and self-care (speaking out abuse). These literacy barriers are supported by Lack (2022) found that insufficient access to braille equipment and assistive reading technologies directly correlates with reduced literacy outcomes and diminished academic self-concept among children with visual impairments and specific learning disabilities. This finding aligns with Kent-Walsh and McNaughton (2015), who argue that without appropriate augmentative and alternative communication (AAC) devices and adequate wait time, children with communication impairments are systematically excluded from classroom discourse, resulting in learned passivity and reduced academic engagement. Exclusion from play-based learning emerged as another critical consequence of AT barriers. A student with spina bifida stated something and this finding is supported by Pankaj, Sharma, and colleagues (2025)*, who found that the absence of appropriate mobility assistive technology directly undermines children's opportunities for play, social interaction, and physical development, perpetuating social isolation and exclusion from peer activities that are essential for holistic child development. Regarding access to broader educational opportunities, one student disclosed that due to lack of an appropriately sized wheelchair, he was unable to reach his classroom and missed two full years of school, resulting in being two grades behind his age-mates. The administrator confirmed that children have been kept at home for months because their only wheelchair broke and the family could not afford repair, stating, "These are months of education lost. Months of social interaction lost. The gap widens every day." This finding echoes research from low-resource settings where device breakdown and lack of repair services lead to prolonged school absenteeism and eventual dropout among children with mobility impairments (Puli, Harniss, and colleagues, 2024).Finally, reduced ability to perform self-care activities at school was identified as a participation barrier. A teacher explained that children without adapted utensils cannot feed themselves and must be fed

by being assisted, which reduces their dignity and consumes instructional time. According to the World Health Organization (2022), the inability to perform basic self-care tasks independently at school not only compromises dignity but also positions children as dependent, reinforcing negative self-perceptions and stigma among peers. From the perspective of the Social Model of Disability (Oliver, 2013), each of these barriers represents an environmental failure rather than a deficiency within the child. The lack of braille writers, text-to-speech software, appropriate mobility devices, communication systems, adapted utensils, and reliable repair services collectively creates an environment that disables children who could otherwise participate fully.

4.5. THEME THREE: WHAT OPPORTUNITIES EXIST FOR THE USE OF AT TO PROMOTE INCLUSION OF CHILDREN LIVING WITH DISABILITIES IN PRIMARY EDUCATION IN HARARE?

This section addresses the third research question regarding opportunities and enabling conditions that can be leveraged to maximise the potential of AT for inclusion, as well as strategies to enhance the inclusion of children with disabilities in AT provision.

4.5.1 Opportunities and Enabling Conditions for AT Integration

Despite significant barriers, participants identified multiple practical opportunities that exist within the current Zimbabwean context. These enabling conditions do not necessarily require large financial investments but instead rely on creativity, training, decentralisation, and leveraging existing resources. The following sub-sections present these opportunities as voiced by participants.

4.5.1.1. Low-Cost, Locally Produced Solutions

One of the most promising opportunities identified by participants is the development and use of low-cost, locally produced AT solutions. Rather than relying solely on expensive imported devices, teachers and parents demonstrated that simple, affordable tools such as 3D-printed pencil grips and homemade communication boards can be highly effective. This opportunity shifts the focus from high-tech, capital-intensive solutions to low-tech, resourceful, and locally driven innovations.

TCH-02 (Teacher) added:

"We 3D-printed pencil grips using a small printer donated by an NGO. They cost 10 cents each. We can make them in any size. One teacher now makes her own communication boards from magazine cutouts and velcro. She didn't need a new device; she needed an idea."

PRN-06 (Parent) confirmed:

"At first, I thought my child needed an expensive tablet from abroad. But the teacher showed me how to make a picture chart using cardboard and old magazines. My daughter now points to what she wants. It cost nothing, but it changed our lives at home."

4.5.1.2. Training as a Viable Investment

Participants consistently highlighted training as a high-impact, low-cost investment. Even short, focused training sessions on tools such as the Picture Exchange Communication System (PECS) and basic switches enabled teachers to adapt materials independently. This finding suggests that building human capacity through training may yield greater long-term benefits than distributing devices without accompanying skills development.

Key Informant 5 (Administrator) stated:

"We received a two-day training from a local NGO on using PECS and basic switches. It cost very little, but it changed how our teachers work. One teacher now adapts her own materials. We need to scale this training to every teacher in Zimbabwe."

TCH-04 (Teacher) added:

"Before the training, I had a box of donated switches that I was afraid to open. After two afternoons of hands-on practice, I now use them daily with three children. Training turned expensive donations into useful tools."

4.5.1.3. Role of NGOs and Public-Private Partnerships

Non-governmental organisations (NGOs) and public-private partnerships were identified as valuable but limited opportunities. While NGOs such as UNICEF have provided training and

resources, participants cautioned that project-based support is often temporary. The opportunity lies not in relying on short-term donor projects but in leveraging NGO partnerships to pilot interventions that government can later systematise and sustain.

Key Informant 1 (Social Worker) noted:

"UNICEF funded a training on inclusive play. But it is a project, not a system. When the project ends, so does the support. We need government to take over, not rely on donors."

ADMIN 2 offered a complementary view commenting what was said by NGO officer:

"NGOs are good at trying new things quickly. Our role should be to test what works and then hand over a proven model to the Ministry. We should not be the permanent provider. That is the government's job, and we must be honest about that limitation from the start."

4.5.1.4. Mobile and Tablet-Based Accessibility Features

A significant and often overlooked opportunity exists in the accessibility features already present on mobile phones and tablets. Participants noted that basic Android devices contain built-in functions such as text-to-speech, speech-to-text, and visual scheduling. Many parents were unaware of these features until shown by teachers. This represents a low-cost, high-impact opportunity that requires only awareness and basic training for parents and caregivers

PRN-04 (Parent) shared:

"Phone yangu inawo ma functions anochinja zvakanyorwa kuti zvinzwike. Ndaisaziva kuti zvingabatsire mwana wangu, asi mudzidzisi vakandiratidza. Izvi zvinoda kudzidziswa vabereki vese vabetsereke."

"My phone has functions that change text so it can be heard. I did not know this could help my child, but the teacher showed me. This requires training all parents to help."

Key Informant 2 (Occupational Therapist) added:

"*There are free apps that provide text-to-speech, speech-to-text, and visual scheduling. These run on basic Android phones. We have started installing these on parents' phones. This is a low-cost, high-impact opportunity."*

4.5.1.5. Decentralisation of Services

Centralised AT assessment and repair services located at major hospitals were described as inaccessible for most families, requiring multiple bus journeys. Participants proposed decentralisation as a practical opportunity establishing district-level assessment hubs at schools like St. Giles, with monthly therapist visits. This strategy would bring services closer to communities, reducing transport costs and waiting times while increasing access tenfold.

Key Informant 3 (Physiotherapist) argued:

"*The central hospital is three bus rides away for most families. If each district had one assessment hub at a school like St. Giles, and if a therapist visited once a month, access would increase tenfold. We need to bring services to the people, not make people come to services*."

The findings reveal that multiple practical opportunities exist at individual, school, and system levels, including low-cost locally produced solutions, training as a viable investment, strategic roles for NGOs and public-private partnerships, mobile- and tablet-based accessibility features, and decentralisation of services. Participants demonstrated that AT solutions need not be expensive or imported, as teachers at St. Giles have begun producing functional AT devices at negligible cost using simple materials such as magazine cutouts and a single donated 3D printer to create pencil grips and homemade communication boards. This finding is supported by Matter et al. (2017), who found that locally produced, customisable assistive devices are more sustainable in low-resource settings than donated high-technology equipment, and by Lynch et al. (2018), who documented how teachers in Ugandan inclusive settings regularly adapt locally available materials for AT purposes. Participants also identified short-duration, low-cost training as one of the most cost-effective enabling conditions for AT integration, with a two-day training on PECS and basic switches changing how teachers work and enabling some to adapt their own materials independently. This finding aligns with the World Health Organization and UNICEF (2022), who argue that training frontline practitioners is the single most underfunded yet highest-return investment in AT systems, and echoes research from Kenya where brief teacher training on AAC resulted in sustained classroom practice changes without additional external input (Bryant et al.,

2020). Regarding NGOs and public-private partnerships, participants voiced concern that international NGO involvement is project-based and time-limited, creating sustainability risks a pattern documented by Borg, Lindström and Larsson (2011), who found that donor-funded AT projects rarely transition into ongoing public services. The opportunity lies in structuring partnerships with explicit government absorption plans, as demonstrated in South Africa (Matter & Eide, 2018). Mobile and tablet-based accessibility features emerged as a highly scalable opportunity, as basic Android phones containing built-in text-to-speech, speech-to-text, and screen magnification are increasingly common among families, yet parents remain largely unaware of these features. This finding is supported by McNicholl et al. (2021), who found that "bring your own device" models for AT allow families to use personally owned smartphones, bypassing the need for expensive dedicated equipment. Finally, participants identified decentralisation of services as a modifiable structural barrier, proposing that each district have one assessment hub at a school with a monthly therapist visit a model echoed in rural Rwanda, where decentralised AT hubs attached to existing health centres increased AT access from 8% to 67% of children in need within eighteen months (Duttine et al., 2020). From the perspective of the Social Model of Disability (Oliver, 2013), each of these opportunities represents a concrete environmental modification that removes barriers to participation without requiring large capital expenditure or foreign imports, depending instead on knowledge dissemination, modest training investments, repurposing of existing technology, and reorganisation of service delivery geography.

4.5.2 Strategies to Enhance the Inclusion of Children with Disabilities in AT Provision

This subsection identifies actionable strategies recommended by participants to strengthen AT service delivery and support for inclusive education. These strategies move beyond identifying problems to offering practical, contextually relevant solutions that can be implemented by government, schools, and community stakeholders

4.5.2.1 Investment in Curriculum-Aligned AT

Participants emphasized that AT must be directly aligned with the national curriculum to be educationally meaningful. Rather than ad hoc donations of unrelated devices, a systematic

investment in curriculum-aligned AT such as screen readers, text-to-speech software, adapted keyboards, and communication devices would ensure that AT supports specific learning outcomes in literacy and numeracy. Participants called for a national essential AT list for primary education, funded by the Ministry rather than donor.

TCH-01 (Teacher) recommended:

"*We need a national list of essential AT for primary literacy and numeracy. Every school should have a minimum package: screen readers, text-to-speech software, adapted keyboards, and communication devices. This should be funded by the Ministry, not donors*."

Key Informant 4 (Administrator) added:

"When the curriculum is developed, it should work with AT experts to adapt learning materials. Our textbooks are not accessible to children with visual or reading impairments. This is a policy failure that can be fixed."

4.5.2.2 Enhancing Teacher Training

Teacher training emerged as a critical strategy for sustainable AT integration. Participants recommended that AT modules be made mandatory in all pre-service teacher training colleges, ensuring that every new teacher graduates with practical skills in using communication boards, adapting materials, and troubleshooting basic device problems. Additionally, in-service training for current teachers was identified as urgently needed, with an emphasis on hands-on, device-based learning rather than theoretical instruction alone

Key Informant 5 (Administrator) stated:

"AT modules should be mandatory in all pre-service teacher training colleges. Every new teacher should graduate knowing how to use a communication board, how to adapt materials, and how to troubleshoot basic device problems. This is not optional; it is essential for inclusion."

TCH-05 (Teacher) added:

"We need in-service training for current teachers. Many of us learned about inclusion in theory but never touched a device. Give us hands-on training. Show us how to use one tablet with 10 different children. We want to learn."

4.5.2.3 Decentralising AT Assessment and Distribution

Centralised AT services were identified as a major access barrier. Participants proposed decentralisation as a practical strategy establishing district-level AT assessment and repair hubs located within special schools such as St. Giles. With therapists visiting each hub twice a month, families would no longer need to travel to Harare for services. Participants argued that this is feasible with existing resources if services are reorganised rather than merely requesting additional funding.

Key Informant 1 (Social Worker) proposed:

"Establish district-level AT assessment and repair hubs located in special schools like St. Giles. A therapist visits each hub twice a month. Families come to the hub, not to Harare. Devices are repaired locally. This is feasible with current resources if we reorganise, not just ask for more money."

Key Informant 3 (Physiotherapist) added:

"*I currently work only at the central hospital. I see perhaps 20 families a week. If I spent one week per month travelling to district hubs, I could see more families because they would not have to travel to me. The same resources, just reorganised, would reach ten times more children."*

4.5.2.4 Promoting Public-Private Partnerships

Participants highlighted the potential of public-private partnerships as a financing and resource mobilisation strategy. Rather than relying solely on government budgets, partnerships with telecom companies (e.g., Econet, TelOne) could provide tablet donations or data subsidies for educational apps. Collaboration with local manufacturers could produce rugged, locally appropriate wheelchairs. This strategy does not require new money but instead demands new thinking and inter-sectoral coordination.

Key Informant 6 (Administrator) suggested:

"The government should partner with telecom companies. Econet or TelOne could donate tablets or subsidise data for educational apps. Partner with local manufacturers to produce rugged wheelchairs. This does not require new money; it requires new thinking and coordination."

TCH-01 (Teacher) offered a concrete example:

"We have a local hardware shop near our school. They donated velcro strips and plastic folders for our communication boards. It cost them very little, but it helped us greatly. If the Ministry created a simple programme encouraging even small businesses to contribute in kind, we would have many more materials"

4.5.2.5 Implementing Inclusive School-Based Programs

A specific school-based strategy proposed by participants was the creation of an "AT Passport" for every child transitioning from a special school like St. Giles to a mainstream school. This passport would document the child's devices, usage instructions, repair contacts, and communication methods. The receiving school would be required to accept the passport and provide basic accommodations, thereby transforming what is often a chaotic and stressful transition into a structured, supportive process.

Key Informant 1 (Social Worker) recommended:

"Create an 'AT Passport' for every child transitioning from St. Giles to a mainstream school. The passport lists the child's devices, how to use them, who to call for repairs, and the child's communication methods. The receiving school is required to accept the passport and provide basic accommodation. This would transform transitions."

PRN-02 (Parent) added:

"*My nephew moved from a special school to a mainstream school last year. The new teachers did not know how his communication board worked. He stopped using it for three months. If there had been a simple paper that explained everything, that would not have happened. This is such a simple idea. Why do we not have it?"*

4.5.2.6 Community Conscientization

Participants emphasized that inclusion cannot succeed within school walls alone. Community conscientization raising awareness and changing attitudes was identified as a foundational strategy. When communities understand what AT is and how it benefits children, parents become more willing to seek help, stigma and shame diminish, and children feel empowered to use their devices openly. Inclusion, as participants noted, begins at home and in the community, not just at school.

Key Informant 2 (Occupational Therapist) added:

"*We have seen that when communities understand AT, parents are more willing to seek help. The shame disappears. The child starts using their device. Inclusion begins at home and in the community, not just at school*."

TCH-05 (Teacher) confirmed:

"*I had a mother who kept her child's hearing aids in a drawer. She was afraid neighbours would laugh and call the child names. After we held a small meeting with four families in her community, where I explained what hearing aids do and showed them a child using one successfully, the mother brought the devices back. The device did not change. The community's attitude changed. That is where inclusion starts."*

The findings reveal six key strategies investment in curriculum-aligned AT, enhancing teacher training, decentralising AT assessment and distribution, promoting public-private partnerships, implementing inclusive school-based programs, and community conscientization. Participants recommended a national list of essential AT for primary literacy and numeracy, including screen readers, text-to-speech software, adapted keyboards, and communication devices, funded by the Ministry rather than donors. This finding aligns with the World Health Organization and UNICEF (2022), who argue that national AT prioritisation lists are essential for equitable resource allocation, and that curriculum development should be conducted in collaboration with AT experts to ensure textbooks are accessible to children with visual or reading impairments a policy failure that participants identified as readily fixable. Regarding teacher training, participants stated that

AT modules should be mandatory in all pre-service teacher training colleges, ensuring every new teacher graduates knowing how to use communication boards, adapt materials, and troubleshoot basic device problems. This finding is supported by the Global Education Monitoring Report (UNESCO, 2020), which found that lack of AT competency among teachers is a primary barrier to inclusive education globally, and by Chiner and Cardona (2013), who demonstrated that teachers who receive hands-on training with devices (not merely theoretical instruction) report significantly higher self-efficacy in inclusive classrooms. Participants also proposed decentralising AT assessment and distribution by establishing district-level AT assessment and repair hubs located in special schools, with therapists visiting each hub twice monthly so families travel to their local district rather than to Harare. This finding echoes research from Uganda, where decentralised AT hubs attached to district special schools reduced waiting times for assessments from twelve months to six weeks and increased repair rates from 15% to 74% (Matter et al., 2017). Regarding public-private partnerships, participants suggested that government should partner with telecom companies to donate tablets or subsidise data for educational apps, and with local manufacturers to produce rugged wheelchairs requiring coordination and new thinking rather than new money. This finding aligns with the Global Report on Assistive Technology (WHO & UNICEF, 2022), which identifies public-private partnerships as a key strategy for sustainable AT provision in low-resource settings, particularly when private sector resources (infrastructure, distribution networks, manufacturing capacity) are leveraged without creating long-term donor dependency. Participants also recommended implementing an inclusive school-based "AT Passport" for every child transitioning from a special school to a mainstream school, listing the child's devices, usage instructions, repair contacts, and communication methods, with the receiving school required to accept the passport and provide basic accommodation. This finding is supported by research on transition planning for children with disabilities, where Lack (2022) found that structured AT handover documentation significantly reduces transition-related educational disruption and device abandonment. Finally, participants identified community conscientization as essential, noting that when communities understand AT, parents become more willing to seek help, shame diminishes, and children begin using their devices because inclusion begins at home and in the community, not just at school. This finding aligns with the Social Model of Disability (Oliver, 2013), which argues that societal attitudes and stigma are themselves environmental barriers that disable children, and with research from Zimbabwe specifically, where Munsaka and

Dube (2018) found that community-based disability awareness programmes directly increased AT uptake and reduced child hiding and seclusion practices. From the perspective of the Social Model, each of these six strategies represents a systemic environmental modification shifting responsibility away from children and families and onto policy, training, service geography, private sector coordination, transition protocols, and community attitudes thereby creating an environment in which children with disabilities can participate fully.

4.7. CHAPTER SUMMARY

This chapter presented, analyzed, and discussed the findings of the qualitative study conducted at St Giles Primary School in Harare on the barriers and opportunities in the use of assistive technologies (AT) for the inclusion of children living with disabilities in primary education. It emerged from the biographical profile which comprised of professional participants had 3-15 years of experience. Most parents engaged in informal economic activities, reflecting constraints common among households of children with disabilities in Zimbabwe. It also emerged that there is a significant gap between the AT needed and what is actually available at St Giles Primary School. It also emerged that there is a mixed level of understanding among stakeholders regarding the role of AT for educational inclusion. The findings of the study also noted multiple barriers to the effective use of AT, including financial constraints, technological limitations. The findings further revealed how these barriers affect children's participation in educational activities. However it revealed suggestion measures.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 INTRODUCTION

The preceding chapter outlined, analysed and interpreted the barriers and opportunities in the use of assistive technologies for the inclusion of children living with disabilities in primary education in Zimbabwe. Case study of St Giles Primary School in Harare. The current chapter provides a comprehensive summary, draws conclusions based on the findings, and offers recommendations grounded in the empirical evidence gathered from participants. According to Creswell (2004), the intent of chapter five is to present the findings, implications, recommendations for implementation and actions, and to suggest studies for future research based on the results of the study.

5.1 Key Findings Summary

This section presents the main findings on the types of assistive technologies available, the barriers that inhibit the inclusion of children with disabilities in the use of AT, how these barriers affect children's participation in educational activities, and opportunities and strategies to enhance inclusion.

5.2.1 Types of Assistive Technologies Currently Available

- **Mobility and Positioning Devices**

The study found that mobility devices were the most common category of AT available, though with severe shortages. The physiotherapist reported approximately 15 wheelchairs for over 60 children who need them (40% of need), 8 paediatric walkers (30% of need), and only 3 standing frames (10% of need). Most wheelchairs are adult-sized and cannot fit under classroom desks, and many devices are second-hand donations that are not the correct size or in good working condition.

- **Communication Devices**

Communication devices were far less available, meeting less than 10% of need. The school has PECS books made from laminated pictures and velcro, and two basic "talk pads" donated three years ago one broken, the other shared by three children on a rotating schedule. The occupational therapist stated that for children with no functional speech, this is completely inadequate.

- **Learning Devices**

Digital learning tools are completely absent (0% availability). The school has one old braille writer shared among three visually impaired students, no braille paper (thick cardboard is used instead), no text-to-speech software, no adapted tablets or computers. The administrator confirmed that digital learning tools meet 0% of the need.

5.2.2 Barriers Faced by Children with Disabilities in the Use of AT

- **Financial Barriers**

Financial constraints were universally cited as the most significant barrier by all 25 participants. Parents reported being forced to choose between food, school fees, and assistive devices. The social worker confirmed that the Disabled Persons Fund "exists on paper" but has never been successfully accessed. The physiotherapist highlighted hidden costs including maintenance, tyre replacements, battery replacements, and new sizes as children grow.

- **Technological Barriers**

The school has no technician on staff, and there is no private repair service for AT in Harare. The physiotherapist noted that a storeroom contains at least 15 broken wheelchairs, 8 walkers, and 3 communication devices. Load-shedding several times per week prevents consistent device charging. Most AT is imported and designed for wealthy countries, with wheelchairs having smooth, small wheels that work on paved sidewalks but fail on Zimbabwe's gravel paths.

- **Systemic and Bureaucratic Barriers**

The social worker described an 8-to-18-month process requiring a doctor at a central hospital, a provincial rehabilitation panel meeting quarterly, then the Ministry of Health, Ministry of Public Service, then device ordering and collection by the family. In that time, the child may have grown or the family may have given up.

- **Social and Attitudinal Barriers**

Children reported being teased and called derogatory names. A student with hearing impairment stated that other children say "this one cannot hear anything" and refuse to play with him. A student with visual impairment reported children grabbing her ear and calling her "bofu" (blind) and hiding

her book. A parent stated that community members say disability comes from evil spirits, causing her to hide her child at home.

- **Knowledge and Training Gaps**

Teachers reported receiving inclusive education training but nothing specific on using or maintaining communication devices. One teacher stated, "When the talk pad broke, I had no idea how to fix it. I felt useless." Parents reported low literacy levels preventing them from understanding assistive technology.

5.2.3 How Barriers Are Affecting Children's Participation in Educational Activities

- **Restricted ability to participate in reading and writing**

A student with visual impairment who only accesses the shared braille writer on Tuesdays stated, "I am falling behind." A teacher explained that without text-to-speech software, a student with dyslexia cannot read independently and has stopped trying to read on her own.

- **Limited participation in classroom Interactions**

A student with communication impairment who knows the answer but cannot point to pictures before peers shout out stated, "I have stopped trying to answer." A teacher acknowledged forgetting to wait for the child with the communication board due to the fast pace of the class.

- **Exclusion from play-based learning**

A student with spina bifida who cannot access the bumpy soccer field without a walker stated, "I sit on the bench and watch." A parent stated that her child has no opportunity to play with peers because she cannot afford mobility devices.

- **Limited access to educational opportunities**

A student disclosed that due to lack of an appropriately sized wheelchair, he was unable to reach his classroom and missed two full years of school, resulting in being two grades behind his age-mates. The administrator confirmed that children have been kept at home for months because their only wheelchair broke and the family could not afford repair.

- **Reduced ability to perform self-care activities**

A teacher explained that children without adapted utensils cannot feed themselves and must be fed by being assisted, which reduces their dignity and consumes instructional time. The social worker noted a safeguarding crisis clarifying that children who cannot communicate effectively cannot report abuse, cannot tell when they are in pain, cannot express their needs.

5.2.4 Opportunities and Strategies to Enhance Inclusion

- **Low-cost, locally produced solutions**

Teachers demonstrated that AT solutions need not be expensive or imported. A 3D printer donated by an NGO produced pencil grips costing 10 cents each. One teacher now makes her own communication boards from magazine cutouts and velcro. A teacher stated, "She didn't need a new device; she needed an idea."

- **Training as a viable Investment**

A two-day training on PECS and basic switches changed how teachers work. The administrator stated, "It cost very little, but it changed how our teachers work. One teacher now adapts her own materials. We need to scale this training to every teacher in Zimbabwe."

- **Mobile and tablet-based accessibility features**

Basic Android phones owned by parents contain built-in text-to-speech, speech-to-text, and screen magnification features that can function as free AT, yet parents were unaware of these until shown. The occupational therapist stated, "We have started installing these on parents' phones. This is a low-cost, high-impact opportunity."

- **Decentralisation of services**

The physiotherapist proposed district-level AT assessment and repair hubs attached to special schools, with therapists visiting twice monthly, reducing travel from three bus rides to a local journey. This is feasible with current resources through reorganisation.

Strategies Identified by Participants

- Investment in curriculum-aligned AT through a national list of essential AT for primary literacy and numeracy
- Mandatory AT modules in all pre-service teacher training colleges
- Decentralising AT assessment and distribution to district-level hubs
- Public-private partnerships with telecom companies for tablets and data subsidies
- Creating an "AT Passport" for children transitioning to mainstream schools
- Community conscientization to reduce stigma and shame

5.3 Conclusion

Informed by the research outcomes, the study yielded the following conclusions the integration of children with disabilities into assistive technology provision at St. Giles Primary School remains severely inadequate, with mobility devices meeting only 40% of need, communication devices meeting less than 10% of need, and digital learning tools meeting 0% of need, and even when devices are present, they are often inappropriate for children's size or the school's physical

environment, as evidenced by the presence of at least 15 broken wheelchairs in a storeroom while children share one walker, illustrating that the problem is not merely resource scarcity but also the absence of repair and maintenance infrastructure. Furthermore, barriers to AT use at St. Giles are multi-dimensional and interconnected, with financial constraints operating as the primary barrier across all 25 participants, while technological barriers (absence of repair services, load-shedding, inappropriate imported designs), systemic barriers (8-18 month bureaucratic delays), social barriers (stigma, teasing, derogatory naming), and knowledge gaps (teachers who never touched a device, parents unaware of mobile accessibility features) collectively create a disabling environment that severely restricts children's participation in reading, writing, classroom interactions, play-based learning, educational progression, and self-care activities, with the social worker's finding that children who cannot communicate effectively cannot report abuse representing a serious safeguarding concern. These findings support the Social Disability Model's central tenet that disability is created when environmental barriers poorly fitted, insufficient, or broken assistive technology, alongside systemic delays and social stigma prevent full participation, demonstrating that societal barriers rather than individual impairments produce disability.

5.3.3 Conclusion on Objective 3: Opportunities for AT to promote Inclusion

Despite severe barriers, multiple practical opportunities exist for enhancing AT use at St. Giles, primarily through low-cost locally produced solutions (pencil grips costing 10 cents, homemade communication boards), training investments (two-day PECS training changing teacher practice), mobile-based accessibility features on parents' own Android phones, and decentralisation of service delivery to district-level hubs. However, these opportunities remain unrealised due to the absence of systematic implementation and government coordination. NGO training is "a project, not a system" ending when donor funding ceases. From the perspective of the Social Disability Model, each opportunity represents a concrete environmental modification that removes barriers to participation without requiring large capital expenditure, depending instead on knowledge dissemination, modest training investments, repurposing of existing technology, and reorganisation of service delivery geography.

5.4 Recommendations

Informed by the study's findings and conclusions, this section presents a series of recommendations aimed at facilitating improved integration of children with disabilities into assistive technology programs at St. Giles Primary School and similar institutions across Zimbabwe.

5.4.1 To the Government and Policy Makers

- **Establish a National Essential AT List for primary education**

They should be "a national list of essential AT for primary literacy and numeracy" including screen readers, text-to-speech software, adapted keyboards, and communication devices, funded by the Ministry rather than donors. The Ministry of Primary and Secondary Education should publish and fund a mandatory minimum AT package for every primary school, with procurement coordinated centrally but distribution decentralised to provinces.

- **Mandate AT Modules in pre-service teacher training**

AT modules should be mandatory in all pre-service teacher training colleges. Every new teacher should graduate knowing how to use a communication board, how to adapt materials, and how to troubleshoot basic device problems. The Ministry of Higher Education should require all teacher training colleges to integrate hands-on AT training (not merely theoretical instruction) into compulsory inclusive education courses.

- **Decentralise AT assessment and repair hubs**

District-level AT assessment and repair hubs located in special schools, with therapists visiting twice monthly, reducing travel from towns to local districts. This is feasible with current resources through reorganisation. The Ministry of Health and Ministry of Public Service should jointly

designate one special school per district as an AT assessment and repair hub, eliminating the current 8-18 month procurement delay.

- **Create an "AT Passport" for transitioning students**

An 'AT Passport' for every child transitioning from St. Giles to a mainstream school" listing devices, usage instructions, repair contacts, and communication methods, should be done by the Ministry of Primary and Secondary Education should develop a standardised AT Passport template and issue a directive that no mainstream school may refuse enrolment based on the AT requirements documented in a passport from a recognised special school.

5.4.2 To St. Giles Primary School and Practitioners

- Establish a school-based AT repair and maintenance system

St. Giles administration should train two existing staff members in basic AT repair, establish a monthly repair schedule and create a partnership with a local engineering workshop for complex repairs.

- **Implement parent training on mobile-based accessibility features**

St. Giles should conduct monthly parent workshops demonstrating accessibility features on families' own mobile phones, using peer trainers as co-facilitators.

- **Establish classroom-level low-cost AT production**

Every classroom at St. Giles should be equipped with a basic low-tech AT production kit (cardboard, velcro, lamination sheets, adapted scissors, and where possible, a shared 3D printer).

- **Implement community conscientization campaigns**

St. Giles should partner with local churches, clinics, and community meeting spaces to conduct quarterly disability awareness sessions, featuring parents and children with disabilities as speakers.

5.4.3 To NGOs and development partners

- **Replace project-based NGO Funding with systemic government integration**

International NGOs should include explicit government transition plans in all AT-related grants, requiring that at least 50% of project activities be co-implemented with government staff and that all training materials be submitted to the Ministry for ongoing use.

- **Establish Public-Private Partnerships for tablet and data subsidies**

NGOs should facilitate partnerships between the Ministry of ICT and mobile network operators to negotiate zero-rating for educational AT apps and subsidised tablets for children with disabilities.

5.5 Implications for Action

5.5.1 Implications for Policy and Practice

The study on barriers and opportunities in the use of assistive technologies for the inclusion of children with disabilities can greatly influence existing policies and potentially lead to the development of new policies to address challenges not currently addressed by present ones.

Policy must shift from device donation to systems building. The finding that 15 broken devices sit in a storeroom while children share one walker demonstrates that donating devices without a repair and maintenance system is ineffective. Policy must fund not only procurement but also technician training, spare parts supply chains, and maintenance schedules.The finding that children with visual impairments cannot access written materials because textbooks are not produced in braille or digital formats indicates that curriculum policy has been developed without AT consideration.

Future curriculum revisions must include AT accessibility as a mandatory design criterion.Teacher professional development must be hands-on, not theoretical. Teachers reported receiving inclusive education theory but never touching a device. Schools must adopt a "low-tech first, low-cost always" AT strategy, prioritising locally produced solutions before seeking expensive imported devices.

5.5.2 Implications for Social Work Practice

According to the International Federation of Social Work (2014), social work is a practice-based profession and an academic discipline that promotes social change and development, social cohesion and the empowerment and liberation of people. Principles of social justice, human rights, collective responsibility and respect for diversities are central to social work.

This study on the barriers and opportunities in the use of assistive technologies for children with disabilities greatly impacts social work practice. The guiding ethics, values and principles of this profession are central to this study; they will aid in championing justice for children with disabilities, identifying challenges they face in accessing AT, activities they are excluded from participating in, and advocating for strategies to address these challenges.

Social workers will be crucial in the development of comprehensive policies and strategies to enhance accessibility of assistive devices, advocate for more funding and resources to access high-priced devices, work collaboratively with other professionals to ensure children with disabilities receive the help they need, and provide psychosocial support to children and their caregivers.

Several social work methods such as casework (providing individualised support to children and families), group work (facilitating parent support groups), community work (conscientizing communities to reduce stigma), administration (developing AT service protocols), and research (evaluating AT program effectiveness) will all be critical to addressing the barriers identified in this study. The social worker's finding that children who cannot communicate effectively cannot report abuse is a direct call to social work practice to ensure safeguarding protocols include communication access for all children.

5.5.3 Implications for Future Study

The suggestions for future study were made by the researcher based on observations of issues which the current study did not address.

- Study Focus

The current study focused on barriers and opportunities in the use of assistive technologies at St. Giles Primary School in Harare. However, future studies can extend focus to

- Analyse the effectiveness of the newly launched National Assistive Technology Strategy (2024) in improving AT access for children with disabilities across Zimbabwe
- Explore how AT provision can be integrated into existing primary healthcare systems to reduce referral delays
- Investigate the prevalence and causes of AT device abandonment in Zimbabwean schools

- Methodological Issues

Future studies can consider adopting a mixed methodology which combines quantitative and qualitative approaches in research design. This would enable measuring of data and provide statistics which are crucial for

- Quantifying waiting times for AT assessment and provision
- Measuring the impact of AT on learning outcomes (e.g., literacy and numeracy gains)
- Calculating cost-effectiveness of different AT delivery models

Such statistical data would be critical in providing objective information about the impact of policies and programs implemented to address AT access, thereby highlighting areas in need of change and amendment.

- Geographic Scope

The current study was limited to a single specialist institution in an urban setting. Future studies should extend to:

- Mainstream schools in both urban and rural settings to compare AT availability and barriers
- Multiple special schools across Zimbabwe's provinces to identify regional variations
- Rural schools where access to AT is likely even more constrained than at St. Giles
- Research Questions

Future research could address questions such as

• What is the cost-benefit ratio of decentralised AT assessment hubs compared to centralised hospital-based systems?

• What is the effectiveness of low-cost, locally produced AT compared to imported devices on learning outcomes?

- How does teacher competency in AT vary across different teacher training colleges in Zimbabwe?

5.6 Chapter Summary

This chapter presented recommendations from the study's findings on AT availability at St. Giles, which was found to be severely inadequate across mobility, communication, and digital devices. Financial constraints emerged as the primary barrier, turning functional impairments into educational exclusion, social isolation, and lost opportunities. Despite this, practical solutions exist, including low-cost local production, mobile accessibility features, and decentralised services. Recommendations focus on government policy (systems building over donations), social work practice (advocacy and psychosocial support), and six future research areas. The study concludes that barriers are systemic failures not just resource shortages in policy coordination, training, service geography, and community attitudes. What is required is political will to reorganise resources, mandate AT training, and decentralise services. Without change, children with disabilities at St. Giles will remain spectators, watching others learn, play, and participate.

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APPENDEX 1

CONSENT FORM PROJECT TITLE: BARRIERS AND OPPORTUNITIES OF ASSISTIVE TECHNOLOGIES IN THE INCLUSION OF CHILDREN LIVING WITH DISABILITIES IN PRIMARY EDUCATION IN ZIMBABWE. CASE OF ST GILES IN HARARE

1. **RESEARCHER CHIDA NYASHA**

PURPOSE OF THE STUDY

To understand how assistive technologies (AT) help children with disabilities at St Giles, identify barriers to using AT, and recommend improvements.

PROCEDURE

The researcher will ask questions about available assistive technologies, their experiences, challenges, and suggestions. The interview will take approximately 30–45 minutes. With your permission, I will take written notes. The interview will not be audio or video recorded unless you separately agree.

RISKS AND BENEFITS

There are no known physical risks. Some questions may feel personal they may skip any question or stop the interview at any time without negative consequences. There is no direct personal benefit, but your views will help improve AT services for children.

CONFIDENTIALITY

Names will not appear in any report. The researcher will use codes instead of names. Only the research team will see the original data. Information will be stored securely and destroyed after for example year

VOLUNTARY PARTICIPATION

They will decide not to take part, or withdraw at any time, without affecting your or your child's relationship with St Giles.

CONTACT FOR QUESTIONS

If you have concerns about this study, please contact Nyasha Chida / 0781276714

CONSENT STATEMENT

I have read (or had read to me) the above information. I understand the study and have had the chance to ask questions. I agree to take part voluntarily.

☐ I agree to be interviewed.

☐ I do not agree to be interviewed.

Participant Name _____

Participant Signature: _____

Date: _____

Researcher Signature: _____

APPENDIX 2

SEMI-STRUCTURED INTERVIEW GUIDE (KEY INFORMANTS)

Section A: Demographic Information

Professional Qualification: _____

Position at St Giles: _____

Duration of Service at St Giles: _____

Role (e.g., teacher, therapist, social worker, administrator): _____

Section B: Available Assistive Technologies

1. What types of assistive technologies are currently available for children living with disabilities St Giles?
2. Which of these are actually in regular use by children?

Section C: Primary Barriers

1. How does cost affect procurement, repair, and replacement of AT at St Giles?
2. Are there challenges with device suitability, durability, or maintenance skills?
3. What transport, infrastructure (e.g., power for charging), or supply chain problems exist?

Section D: Opportunities and Enabling Conditions

4. What opportunities and enabling conditions exist that can be leveraged to maximise the potential of AT for inclusion?
5. Are there existing partnerships with NGOs, donors, government, or private sector that support AT?

Section F: Recommended Strategies

6. What specific improvements would you suggest for AT assessment, provision, training, and follow-up at St Giles?
7. What role should social workers play in AT service delivery?

APPENDIX 3

IN-DEPTH INTERVIEW GUIDE (FOR PARENTS / PRIMARY CAREGIVERS)

Section A: Demographic Information

Gender: _____

Age: _____

Relationship to child: _____

Your level of education: _____

Child's type of disability: _____

Child's grade/class at St Giles: _____

How long has your child attended St Giles? _____

Section B: Available Assistive Technologies

1. What devices are currently available and working?
2. Was this device provided by the school, government, or did you buy it?
3. Are there devices your child needs but does not have access to?

Section C: Primary Barriers

4. Have you or the school struggled to afford the device, repairs, or replacement parts?
5. Does the device break easily, fit poorly, or is it hard to use?
6. Have you or your child faced stigma, teasing, or low expectations from others because of the AT or disability?

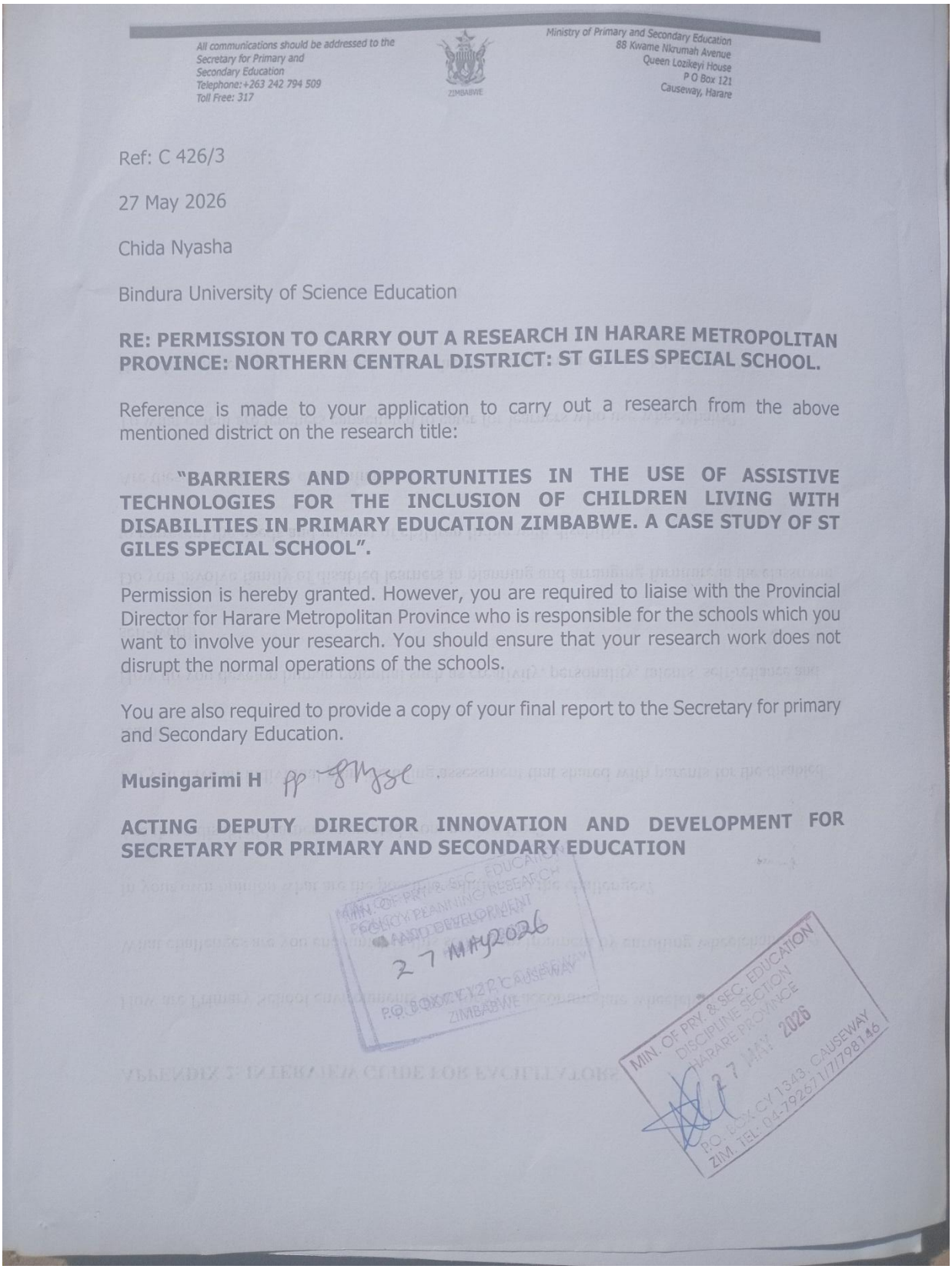
Section D: Opportunities and Enabling Conditions

7. Are there local people, workshops, or initiatives that assist with AT?
8. What positive attitudes from school staff or other parents have you observed?
9. What would you like to see continued or expanded?

Section E: Recommended Strategies

10. What changes would most improve AT services for your child?
11. What training or information do parents need about AT?
12. How should repairs and replacements be handled in the future?

APPENDIX 4 APPROVAL LETTER



All communications should be addressed to the Secretary for Primary and Secondary Education
Telephone: +263 242 794 509
Toll Free: 317

ZIMBABWE

Ministry of Primary and Secondary Education
88 Kwame Nkrumah Avenue
Queen Lozikeyi House
P O Box 121
Causeway, Harare

Ref: C 426/3

27 May 2026

Chida Nyasha

Bindura University of Science Education

RE: PERMISSION TO CARRY OUT A RESEARCH IN HARARE METROPOLITAN PROVINCE: NORTHERN CENTRAL DISTRICT: ST GILES SPECIAL SCHOOL.

Reference is made to your application to carry out a research from the above mentioned district on the research title:

"BARRIERS AND OPPORTUNITIES IN THE USE OF ASSISTIVE TECHNOLOGIES FOR THE INCLUSION OF CHILDREN LIVING WITH DISABILITIES IN PRIMARY EDUCATION ZIMBABWE. A CASE STUDY OF ST GILES SPECIAL SCHOOL".

Permission is hereby granted. However, you are required to liaise with the Provincial Director for Harare Metropolitan Province who is responsible for the schools which you want to involve your research. You should ensure that your research work does not disrupt the normal operations of the schools.

You are also required to provide a copy of your final report to the Secretary for primary and Secondary Education.

Musingarimi H pp

ACTING DEPUTY DIRECTOR INNOVATION AND DEVELOPMENT FOR SECRETARY FOR PRIMARY AND SECONDARY EDUCATION

MIN. OF PRY. & SEC. EDUCATION POLICY, PLANNING, RESEARCH AND DEVELOPMENT
27 MAY 2026
P.O. BOX CY 121 P.C. CAUSEWAY ZIMBABWE

MIN. OF PRY. & SEC. EDUCATION DISCIPLINE SECTION HARARE PROVINCE
27 MAY 2026
P.O. BOX CY 1343, CAUSEWAY ZIM. TEL: 04-792671/7798146