



Environmental Adaptations for the Inclusion of Learners with Visual Impairment at Korogwe Girls Secondary School in Tanzania

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Abstract: This study explored the physical and classroom environmental adaptations implemented to promote the inclusion of students with visual impairments at Korogwe Girls' Secondary School in Tanzania. Although considerable progress has been made toward inclusive education, students with visual impairments continue to face barriers that limit their equal access to quality education and opportunities to develop essential life skills. To investigate these adaptations, the study adopted an exploratory qualitative case study design. The study population comprised students with visual impairments and teachers from a selected inclusive secondary school. Criterion purposive sampling was used to select one school from the three inclusive secondary schools in Korogwe District. A total of 15 participants took part in the study. Data were collected through semi-structured interviews, focus group discussions, and non-participant observations. The trustworthiness of the findings was ensured by adhering to the qualitative research criteria of credibility, transferability, dependability, conformability, and authenticity. The findings revealed that the school had implemented several environmental adaptations to support the inclusion of students with visual impairments, including accessible infrastructure, appropriate teaching and learning materials, inclusive instructional strategies, and orientation and mobility training. Despite these efforts, the study found that many students still required assistance when moving around the school environment, indicating that existing adaptations were not sufficient to ensure full independence. The study concludes that inclusive education can be strengthened by providing learning materials tailored to the varying levels of visual impairment and by extending orientation and mobility training to all members of the school community. Such measures would enhance accessibility, participation, and learning outcomes for students with visual impairments.

Keywords: Inclusive Education, Classroom Environments, visual impairment, Physical Environments, Adaptations

How to cite this work (APA):

Nyaki, A. G., Simalalo, M., Chitumbo, E. M. & Garaba, A. M. (2026). Environmental Adaptations for the Inclusion of Learners with Visual Impairment at Korogwe Girls Secondary School in Tanzania. *Journal of Research Innovation and Implications in Education*, 10(3), 789 – 797. <https://doi.org/10.59765/wpsr2>

1. Introduction

The concept of inclusive education has been spelt out in the Salamanca statement and the framework for action on special needs education 1994 and United Nations Convention on the Right of persons with Disabilities UNCRPD in 2006, where all governments have been urged

to “adopt as a matter of law or policy, the principle of inclusive education, enrolling all students in regular schools unless there are compelling reasons for doing otherwise” (Mitiku et al., 2014). Inclusion considers schools from the students' perspective and seeks ways to provide them with choice, dignity, and self-esteem by designing inclusive learning environments (Mishra et al, 2019). To make a school more inclusive, the consideration

of new building schemes and adaptations is very essential. Several general aspects, such as landscape architecture and interior spaces require attention to support this goal (Triatmodjo, 2020). The school buildings contain all the constructions within the school compound, such as corridors and sidewalks, water ditches, staircases, halls, toilets, apartments, a library and a resource room. Buildings should enable all school community members to enter, move around, and participate in all aspects of school life to the best of their abilities and interests (Malik et al., 2018).

Johnson & Muzata, (2019) suggested school environment should be designed to allow all students to participate in learning processes through different activities with a flexible curriculum that caters for students with various backgrounds, cultures, learning needs, and abilities. Based on the three principles of the Universal Design for Learning (UDL), which are representation, action and expression, and engagement, a teacher can plan a lesson that meets the needs of all students in an inclusive classroom. According to (Simalalo, Gasa, & Muzata 2022; Okello, 2024), recommended that environmental adaptations attained by the school towards the inclusion of learners with visual impairments are supported by arguments that inclusion makes them feel welcomed, confident, and friendly. Furthermore, school physical facilities are essential tools to facilitate and stimulate learning progress (Loreman et al, 2017).

The physical structures tend to be only partially accessible and these particular students still confront some level difficulties with access. According to Ndhlovu, (2021), revealed that, the new built environment become problems to the learners with visual impairments, especially when they lack the orientation and mobility of the new environment. Furthermore, Cook and Rao, (2018), suggested that learners with visual impairment are often not consulted prior to decision –making, which limits their contribution to how designs can be made more inclusive.

The government of Tanzania, like other countries worldwide, was encouraged by global efforts such as Education for All (EFA), the Millennium Development Goals (MDGs), and the Salamanca Statement, among others, to adopt a school learning environment that would allow all students, regardless of their differences (physical, economic, social, and psychological), to learn together in inclusive schools. Tanzania is among the active nations that have ratified and included various international policies and conventions regarding inclusive education at different levels (Tungaraza, 2014). The aims were to improve education services, increase accessibility for students with special needs, especially children with VI, and create opportunities and access to quality secondary education (MoEVT, 2009; MoEST, 2017).

Karuhawe and Possi (2021) suggested that a policy on rewarding teachers for designing specific teaching and learning strategies in inclusive secondary schools should be

formulated. It should target several strategies qualifying for rewards in terms of their efficiency in facilitating lesson understanding for students with visual impairments, the application of the strategy, and the type of reward to be offered. Moreover, (Simalalo & Hambulo, 2019; Mantlow, 2023) revealed that with significant support, the school should run the inclusivity programmes very well to avoid some barriers for students with visual impairment.

Despite the government commitment in Tanzania, such as the education and training policy of 2023, the disability rights of 2014, the Act on Disability of 2010, and the National Curriculum Framework for Basic and Teacher Education (NCFBTE) of 2019, which advocate equal access to schooling for all people regardless of their differences (URT, 2004; URT, 2010; URT, 2014), still, studies reported different challenges that students with visual impairment generally face in their inclusion at diverse levels of education in Tanzania (Msoka et al., 2022).

Therefore, the authors of this article strongly believed that there are missed opportunities to explore the physical and classroom environment adaptations made for inclusion of students with visual impairments in Korogwe district, Tanzania.

Specific Objectives

The following are the specific objectives that guide this study;

1. To determine the physical environmental adaptations attained by the school to support students with visual impairments.
2. To explore classroom environment adaptations deliberated to include students with visual impairments.

2. Literature Review

Research from North America shows that environmental adaptations are important for including learners with visual impairment in schools. Countries such as the United States and Canada have laws like the Individuals with Disabilities Education Act (IDEA), which require schools to provide support for learners with disabilities. Schools use different adaptations, including accessible classrooms, Braille materials, assistive technologies, good lighting, and mobility support. Miyauchi (2020) found that successful inclusion depends on a supportive environment, trained teachers, available learning tools, and positive attitudes toward learners with disabilities. The study also showed that poor school environments can prevent learners with visual impairment from fully participating in education. Schultz and Savaiano (2023) added that inclusion requires not only accessible buildings but also suitable teaching materials and support from teachers and specialists. Although North American schools have more resources than many developing countries, their experiences show

that creating accessible learning environments is necessary for the effective inclusion of learners with visual impairment.

Studies from Europe show that environmental adaptations are important for the inclusion of learners with visual impairment. Research by Miyauchi (2020) found that accessible facilities, assistive technologies, and trained teachers support effective inclusion. Rapp et al. (2020) emphasized that Universal Design for Learning helps schools create flexible environments that meet the needs of different learners. Similarly, McLinden et al. (2021) highlighted the importance of accessible learning materials, specialist support, and assistive devices in improving participation. Although Europe has advanced inclusive education systems, challenges such as unequal access to resources and limited teacher skills still affect learners with visual impairment. Overall, European studies demonstrate that supportive and accessible learning environments are essential for successful inclusion.

Research from Asia shows that environmental adaptations play an important role in improving the inclusion of learners with visual impairment. Countries such as Japan, India, Malaysia, and China have introduced inclusive education practices that focus on accessible school facilities, assistive technologies, adapted learning materials, and teacher support. For example, Miyauchi (2020) found that learners with visual impairment benefit when schools provide accessible learning environments, appropriate teaching strategies, and assistive devices. Similarly, Singal (2019) reported that inclusive education in Asian countries continues to face challenges related to inadequate resources, limited teacher preparation, and difficulties in implementing disability-inclusive policies. In India, Kumar and Singh (2021) emphasized that assistive technologies, Braille materials, and supportive classroom environments are essential for improving educational participation among learners with visual impairment. These studies show that while many Asian countries have made progress in promoting inclusion, barriers such as insufficient resources, lack of trained teachers, and inaccessible learning environments continue to affect the full participation of learners with visual impairment.

Studies from Australia and Oceania highlight the importance of creating accessible and supportive learning environments for learners with visual impairment. Inclusive education policies in Australia emphasize equal access, reasonable adjustments, assistive technologies, and individualized support to enable learners with disabilities to participate in mainstream education. Foreman and Arthur-Kelly (2017) noted that successful inclusion of learners with disabilities requires accessible school environments, skilled teachers, and collaboration among educators, families, and support professionals. Similarly, Capp (2017) emphasized that Universal Design for Learning (UDL) approaches help schools create flexible environments that respond to diverse learner needs,

including those with visual impairment. Research by McLinden et al. (2021) further showed that learners with visual impairment require appropriate assistive technologies, accessible educational materials, and specialist support services to achieve meaningful participation in schools. Although Australia has stronger educational resources compared with many developing countries, these studies demonstrate that continuous environmental adaptation remains necessary to ensure effective inclusion of learners with visual impairment.

Special education (SE) in Tanzania may be traced back to the 1950s when missionaries established the nation's first school for blind students in Dodoma (Kisanga, 2018). PWDs in Tanzania benefited from the 1948 Universal Declaration of Human Rights since formal education was available. Only religious and charitable groups provided education to PWDs in Tanzania before and during the initial years following independence (Possi & Milinga, 2017).

The first integrated school for children with VI, Uhuru Elementary School, was established in 1963 when the government joined forces to provide education to PWDs (Possi & Milinga, 2017). As a result, the Tanzanian government constructed numerous inclusive primary schools for SwVI, including Ikungi Inclusive Primary School in Singida region (1968), Pongwe Inclusive Primary School in Tanga region (1968), Hombolo Inclusive Primary School in Dodoma (1970), and Mwanihala Inclusive Primary School in Shinyanga region (1973), (Tungaraza, 2012). It is important to note that the progress in education for visually impaired students in Tanzania was not a solitary effort. Mpwapwa Secondary School, located in the Dodoma district, was the first secondary school in Tanzania to accept SwVI (Tungaraza, 2012). This was made possible by the concerted efforts of both the government and humanitarian organisations. A few years after independence, they worked together to ensure that people with VI could receive an education. These initiatives and others significantly support the ongoing expansion of 15 educational opportunities for PWDs, especially those with VI, in Tanzania (Possi & Milinga, 2017). However, no laws or regulations have yet been passed to make the provision of inclusive education in Tanzania legitimate. It was not until 2004 that the Tanzanian government adopted the first disability policy, which declared that a favourable environment would allow for inclusive education (URT, 2004). People with impairments, especially those with VI, are currently overrepresented at all educational levels.

Recent studies emphasize that accessible physical environments, including barrier-free buildings, Braille signage, appropriate lighting, and classroom modifications, are essential for promoting the participation and academic success of learners with visual impairments in inclusive schools (Najmee et al. (2024). Research in Africa shows that accessible school environments significantly influence the enrolment, participation, and academic achievement of

learners with visual impairments in inclusive schools (Okello, 2024). The learning environment should be user-friendly for inclusion to accommodate all students in inclusive schools (Miyachi, 2020). The ground environment contains many things, such as gardens and sports grounds. Therefore, orientation and mobility skills should be applied for learners with visual impairment to socialize with the environment (Opie, 2018).

Kisanga (2018) reveals the significance of equipping teachers at various levels of education with skills on how to prepare and deliver instructions which regard the individual educational needs of all students. He further recommends that these training programmes on inclusive pedagogies should be compulsory for all teacher-trainees in colleges and universities. This can be integrated into the teacher education curriculum at all levels of education for pre-service teachers, and the training can be in the form of special seminars or workshops for in-service teachers.

A study of Mpu and Adu (2021) on the challenges of inclusive education and its implementation in schools in which the study recommended that poor physical infrastructure in schools is one of the significant problems experienced by SWVI. The construction of school buildings, even those constructed under the new government, does not consider the needs of learners with physical disabilities and other disabilities. Feelings of neglect by and dissatisfaction with educators: It was observed that the type of education received by learners with disabilities is of inferior quality; in fact, they did not consider themselves to be receiving any education (Avramidis, 2013).

However, more research needs to be done about students with visual impairment in Tanzania. Based on the literature many study has focused more on exploring the challenges facing students with visual impairment at the primary level. Thus to cover the existing knowledge gap, it was essential for the current study to be conducted.

Social Model of Disability Framework

This study was guided by the social model of disability, pioneered by Mike Oliver in 1983 (Rieser, 2002). The social model of disability emphasizes the distinction between disabilities and impairments. According to the model, society creates barriers (physical, architectural, attitudinal) that hinder those with impairments, restricting their full participation in society (Barnes & Oliver, 1998; Levitt, 2017). The model is relevant to the study because it supports the principles of inclusive education and encourages the removal of barriers that hinder Students with Visual Impairments (SwVI) from accessing a high-quality environment for secondary education (Owens, 2015).

3. Methodology

The study used the Constructivist paradigm to explore adaptations to the physical and classroom environments to include students with visual impairments. The exploratory case study design guided the study and data collection. According to Frank and Joshi (2017), an exploratory case study research approach produces a thorough grasp of a difficult subject in its actual setting. The chosen research design enhanced the findings of this study by offering several benefits, such as enabling examination of connections among the study's context, individuals, and research topic, and providing flexibility in data collection through a variety of low-cost approaches (Creswell, 2014). The study population comprised all students with visual impairments and teachers at Korogwe Girls' inclusive secondary school. This study adopted the purposive sampling technique because it allows the researcher to get a great deal of information on the study of the specific research questions and select participants who will provide detailed information about this study (Lawson and Beckett, 2020). Under purposive sampling, the researcher applied the criterion sampling technique to select a sample from SwVI, special needs teachers, resource room teachers, and teachers. A sample of 15 participants was used in the study, comprising 9 students with visual impairment, 1 Headmistress, 3 Teachers, 1 resource room teacher, and 1 Head of the special education department. Semi-structured interviews, Focus Group Discussions, and non-participant observation guides were used to collect data. The study employed three research tools: semi-structured interview guides (staff members), observation guides (researchers), and focus group discussion guides (for SwVI).

Before the beginning of data collection at the research location, the researcher sought permission from the university administration boards, which provided a go-ahead notice for the researcher to interact with the research subjects. Therefore, the researcher also gets approval from the relevant regional municipality, district municipality, and school administration before the start of data collection at the research site. The researcher in this study assured volunteerism by providing participants with informed permission forms and information regarding voluntary involvement. A week before the start of the data-gathering process, the researcher gave the informed permission forms. The collected data were analyzed thematically following the steps by Bryman (2012). This involved the categorization of data following six steps: familiarization, generation of initial codes, searching for themes, theme review, defining and naming the themes, and finally writing the report under the subheadings of the themes.

4. Results and Discussion

This section presents the study's findings, with corresponding discussion for clarity. The presentation of the findings is grouped into common themes collected from semi-structured interviews, Focus Group Discussions, and

non-participant observation based on specific objectives highlighted. These data were supported by evidence from the field, which was coded from 01 to 15 based on the situation.

4.1 Results

4.1.1 The Physical Environmental Adaptations Attained by the School to Support Students with Visual Impairments.

The study had the specific objective of determining the physical environmental adaptations attained by students with visual impairments under two categories: the accessibility of the building that supports such students at Korogwe Girls' Secondary School, and orientation and mobility training.

Accessible buildings

The study found that the adaptations and modifications were done effectively and made the SwVI feel comfortable during learning process. From the participants' narrations, these modifications included toilets and hostels, braille signage, staircases, hallways, and corridors. This was confirmed by interviewee 01 and 11, who said,

"The school environments we have here consider students with visual impairments. We create ramps and elevators in large areas to help students move from one place to another without obstacles" (Interviewee 01).

"Students with visual impairments do not have any problems related to buildings." (Interviewee 11).

Orientation and Mobility Training

It is believed that during the vacation, the school constructs and modifies some parts of the school environment. Therefore, the school somehow changed the modality; that way, orientation and mobility were needed several times. During the interview and focus group discussion, the participant indicated that in Korogwe girls' secondary school, the management and department of special education were making sure that orientation and mobility were given to all school members about how to treat and care for students with diversity, especially those with VI. This was confirmed by five staff members who narrated the same that:

"We train and orient the new students and teachers on socialising with these students with VI. This is because we want to avoid the issue of isolation and segregation" (Interviewee 02, 08, 15, F.G.D. 02, 06).

"When the students arrive here at our school, we take time to orient them with the

environment positively, and after one week, everyone masters the environment" "F.G.D. 01, 08 and interview 09).

4.1.2 To Explore Classroom Environment Adaptations Deliberated to Include Students with Visual Impairments.

This section explored the classroom environment adaptations deliberately designed to include students with visual impairments through two aspects: the accessibility of teaching and learning materials and the strategies for the learning and teaching process.

Accessible learning and teaching materials

Findings from this theme reveal the materials used by SwVI: Braille books, audio and large print, and assistive technology or digital text. These materials were used depending on the nature of the VI a student had; both should be adapted depending on the degree of disability and what they can manage to use. Braille-printed books were the correct format, facilitating access to teaching and learning materials and assessment tasks. Narrations from the participants revealed that braille used in printed books was braille grade two (contracted braille), commonly used by SwVI. This was confirmed by one participant, who noted,

"We have the Braille books for blind students from the Tanzania Institute of Education (TIE), like the other books for sighted students" (Interview 03, 02, 06, 07).

Moreover the participants stated that;

"We have braille books from TIE in braille format, but they are not enough to get knowledge in secondary education; more information is needed, and we lack knowledge from other sources" (F.G.D 13, 14, 15 and Interview 01, 03, 07).

Strategies of learning and teaching process

The study revealed that some teachers' teaching methods were particularly beneficial for SwVI. They utilised multisensory teaching methods, provided accessible materials, and used flexible language, listening and audio records, incorporated accessible tools and equal treatment, not special treatment as well as empowering them with the necessary resources. One of the participants from SwVI explained that;

"Teachers' methodology during teaching development is adaptive and beneficial to all learners, regardless of their diversity. They were considering the use of tactile resources" (Interview 04, 09, 12)

4.2 Discussion

4.2.1 Physical Environmental Adaptations

The findings answered the study objective on what physical environmental adaptations the school made to support students with visual impairment. The study revealed that accessible buildings, inclusive grounds, and orientation and mobility. Nevertheless, despite the presence of accessible buildings and application of orientation and mobility skill, that accommodate all students, regardless of their diversity still SWVI need help to accessing the movement from one place to another and being familiar with the currently environment. Thus, the challenges limited students' access the school environment especial when supposed to develop their own skills like independent skills on extracurricular. One of the challenges was the need for the school owner to modify the school environment for the aim of meeting the needs of all learners. Further, the study revealed that implementing structural changes to create a welcoming educational atmosphere that meets the requirements of students with diversity is necessary to effectively target kids with diversity in inclusive schools. Nevertheless, the study was supported by the social model of disability adopted, which advocates for equal rights, inclusion, and removing barriers to ensure that disabled individuals can participate fully in all aspects of society (Goering, 2015)

However, the study found that school pathways and pavements were cleared, but not in all school areas. Other places needed more modification, so as we covered those few barriers, the majority of participants, who are teachers and students with VI, confirmed that, in a high percentage, the school considered the presence of pathways and pavement that should be used by all students regardless of their diversities. During observation, the researcher noted that although the school had constructed the paths and pavements in the more critical areas, more effort was still needed in those remaining areas. Similarly, the study by Maemba (2017) found that the school environment was not supportive of ensuring the implementation of inclusive education since they lacked proper structures like pavement to help ease movement for students with VI when using white canes.

4.2.2 Classroom Environment Adaptations

The study established that enough supportive materials were found in the classroom. However, the most accessible materials for learning and teaching were provided across the broad spectrum of students with visual impairments. The few available service provisions include free access to braille books, significant printing papers, and assistive technologies. Information obtained from participants and an on-the-spot observational checklist check showed that the school had enough braille books from TIE for blind students, and braille grade two was used. However, it was not enough to prepare the knowledge given to students since the braille books depended on one company. The

study established that despite the one source of braille books available in the school, teachers were struggling to find other knowledge from other sources before the class session so that they could impart enough knowledge to the students. The current study findings were similar to those of the study by Addison & Williams, (2023). William (2023), which established that for the students to use the books and develop competencies in the subjects there, should be a need to have different braille books from different sources. Furthermore, Students with VI, for their part, maintained that they over-relied on the less modern technologies, such as Braille format audios, magnifying machines, audiobooks and publications, and talking calculators.

The study further established that most participants reported that teaching and learning strategies should be well addressed to accommodate all learners, regardless of their diversities. This was supported by the education policy of 2014, (Simalalo & Gasa, 2022); Siandula & Simalalo, 2023) which emphasises that the school should develop strategies for the teaching and learning process depending on the degree of disability available and the type of disability. The study reveals that teachers at various levels of education needed to be equipped with strategies to prepare and deliver instructions that would accommodate students with diverse needs through compulsory training for all teachers in inclusive settings on teaching pedagogies that accommodate diverse needs. However, there are challenges facing all students academically, economically and socially; those are typically barriers that hinder the learning process of students with visual impairment. For example, in classrooms, few teachers and peers used to exclude students with visual impairment.

Also, findings revealed that the classroom arrangements were not noticeably different; the classes needed to be arranged so that every student could be accommodated well as a member of a certain level of education, regardless of their disabilities. The findings showed that the classes were not spaced enough and that the way things like desks, tables, and blackboards were placed presented challenges to the students with VI. For instance, students with VI narrate that 'the students with VI were not taken into consideration during the learning and teaching process, were not given priority to sit in front, and some teachers did not care about that situation'. Similarly, the study by Chiner et al. (2013) revealed that different strategies enable learners with VI to learn smoothly in well-arranged classrooms and an adapted listening environment. Low-vision students will sit appropriately in class to see prints clearly on the chalkboard. Therefore, effective seating arrangement was important in the inclusive classroom to enhance teaching and learning process to be effectively.

5. Conclusion and Recommendations

5.1 Conclusion

Accessible school environmental adaptations revealed in this study entail that there are enough buildings, and modifications were made to accommodate all learners regardless of their diversity. Furthermore, orientation and mobility were applied effectively, though more effort was needed, especially if any changes were made within the school compound. But also, the study revealed that some of the teachers' teaching methods benefited SwVI. Few teachers know how to teach an inclusive class. They did not consider the presence of students with VI because they had little knowledge about disabilities and had never met them.

5.2 Recommendations

Based on the study findings, the following recommendations have been developed:

1. These learning materials should be acquired to allow SwVI unlimited access to many advanced assistive technologies, like computers with pertinent programs for SwVI and note-takers.
2. Special training programs should be constantly organised for teachers and SwVI to orient them on how to operate different assistive technologies in the teaching and learning process for SwVI.

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