

**TEACHING PHYSICAL EDUCATION TO LEARNERS WITH VISUAL
IMPAIRMENT: A CASE OF A SPECIAL SECONDARY
SCHOOL IN SOROTI CITY, EASTERN UGANDA**

BY

NANDUTU IRENE EUNICE

22/U/GMSN/532/PE

**A DISSERTATION SUBMITTED TO THE DIRECTORATE OF RESEARCH AND
GRADUATE TRAINING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF A DEGREE OF
MASTER OF SPECIAL NEEDS EDUCATION OF
KYAMBOGO UNIVERSITY**

NOVEMBER, 2025

DECLARATION

I, **Nandutu Irene Eunice**, do solemnly declare to the graduate board of Kyambogo University that this research dissertation is my original initiative and deliberate effort. No part of this study has been submitted for another degree in this university or any other institution of higher learning for the same award.

Signature:

NANDUTU IRENE EUNICE

Date

APPROVAL

The writing and presentation of this dissertation was done following the guidelines on supervision of research projects set by Kyambogo University and it is hereby submitted to the graduate board with our approval as supervisors

Signature.....

DR. JOSEPH ODEKE-NATO

Date

(Principal supervisor)

Signature

DR. ABDUL BUSUULWA

Date

(Supervisor)

DEDICATION

This piece of work is dedicated to my family, especially my husband Peter, my children Allan, Prosper and Brilyn. I also dedicate it to my siblings Harriet, Lydia, Cyrus and Winnie not forgetting my loving parents, Mum, Namyeka Grace and my Dad Timothy Kyenje for their support both spiritual and financial towards this course.

ACKNOWLEDGEMENT

Nothing much would have been done if it wasn't of some significant persons in this study. Before these persons, I would like to thank God first, who gave me life, energy, and wisdom to accomplish this important academic and professional milestone.

Great thanks to the participants who sacrificed their time to take part in this study. God bless you all.

My sincere gratitude goes to my supervisors, Dr. Odeke Nato Joseph and Dr. Abdul Busuulwa, for the continuous guidance during the study. May God bless you.

Special appreciation goes to the Ministry of Education and Sports for the partial scholarship they offered me under the Uganda Independence Scholarship Trust Fund (UISTF) to ensure I complete my studies.

My appreciation further goes to the entire Faculty of Special Needs and Rehabilitation through its lecturers for the guidance and moral support, especially Dr. Stackus Okwaput, for guiding us through research seminars. May God bless you.

I further want to appreciate my friend Kotaki Robert, the Chief Operations Officer, Bududa Learning Centre (BLC), for the financial support during this study. More appreciation to Mr. Mukhwana Michael, lecturer in the Department of Visual Impairment Studies, for the academic guidance on a friendly basis. Thank you so much, and may God reward you.

Finally, my sincere gratitude to my husband Peter, for supporting this course both spiritually and financially. Not forgetting my family members, my mother, Namyeka Grace, and my father, Timothy Kyenje. May God bless you.

TABLE OF CONTENTS

DECLARATION.....	i
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
LIST OF ABBREVIATIONS	viii
ABSTRACT.....	x
CHAPTER ONE: INTRODUCTION.....	1
1.0 Introduction	1
1.1 Background to the study.....	1
1.1.1 Historical background	1
1.1.2 Conceptual background.....	4
1.1.3 Contextual background	6
1.1.4 Theoretical background.....	7
1.2 Statement of the problem	9
1.3 Purpose of the study	10
1.4 Specific Objectives.....	10
1.5 Research questions	11
1.6 Justification of the study	11
1.7 Scope of the study	12
1.8 Significance of the study	12
CHAPTER TWO: REVIEW OF RELATED LITERATURE.....	14
2.0 Introduction	14
2.1 PE activities that LwVI engage in.....	14
2.2 Available adapted educational resources used for teaching PE to LwVI	19
2.3 Suitability of the PE Teaching Environment for LwVI	26
2.4 Research Gap.....	33
CHAPTER THREE: METHODOLOGY	35
3.0 Introduction	35
3.1 Research Approach	35
3.2 Research Design.....	35
3.3 Area of study	36

3.4 Target population	36
3.5 Sample Size	36
3.6 Sampling Technique.....	37
3.7 Methods of Data Collection	38
3.7.1 Interview	38
3.7.2 Observation.....	39
3.8 Rigor and Trustworthiness	39
3.9 A pilot study	40
3.10 Data Collection Procedures	41
3.11 Data Analysis	41
3.12 Ethical Considerations.....	42
3.13 Limitations and delimitations.....	43
CHAPTER FOUR: PRESENTATION, INTERPRETATION, AND DISCUSSION OF FINDINGS	45
4.0 Introduction	45
4.1 Description of the Participants	45
4.2 The Physical Education Activities that Learners with Visual Impairment Engage in	48
4.2.1 Adapted Ball Games	48
4.2.2 Tactile Games	51
4.2.3 Modified Team Sports	52
4.2.4 Guided Physical Exercises.....	54
4.2.5 Summary of Theme 1: PE Activities that learners with visual impairment engage in.	55
4.3 The Available Adapted Educational Resources Used for Teaching PE to learners with visual impairment.....	56
4.3.1 Specialized PE Equipment.....	56
4.3.2 Accessibility of Instructional Materials.....	58
4.3.3 Teacher Resource Training.....	59
4.3.4 Availability of Assistive Technology	61
4.3.5 Adaptation of Traditional Resources	63
4.3.6 Integration of Sensory Resources	64
4.3.7 Effectiveness of Resource Utilization	65
4.3.8 Summary of Theme 2: Adapted Resources	66

4.4 The Suitability of the PE Teaching Environment for LwVI	67
4.4.1 Safety of the Teaching Environment	67
4.4.2 Accessibility of Facilities	69
4.4.3 Adequacy of Space	70
4.4.4 Clarity of Spatial Orientation	72
4.4.5 Adaptation of the Physical Layout	73
4.4.6 Sensory Stimulation in the Environment.....	74
4.4.7 Presence of Assistive Features	75
4.4.8 Condition of the Resources.....	77
4.4.9 Challenges Faced in Teaching PE to LwVI.....	78
4.4.10 Summary of Theme 3: Suitability of the Environment	81
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS	82
5.0 Introduction	82
5.1 Summary of Findings	82
5.1.1 Summary of Findings on PE Activities That LwVI Engage In	82
5.1.2 Summary of Findings on the Available Adapted Resources Used for Teaching PE to 83	
5.1.3 Summary of Findings on the Suitability of the PE Teaching Environment for LwVI. 83	
5.2 Conclusions	83
5.3 Recommendations of the Study	84
5.4 Areas for Further Research	87
REFERENCES.....	88
APPENDICES	95
Appendix I: Introductory Letter from the University.....	95
Appendix II: Interview Guide for the Teachers.....	97
Appendix iv: Letter to the School Administration.....	103
Appendix V: An observation checklist.....	105
Appendix VI: Introductory letter to the participants of the study	107
Appendix VII: Consent Form for the participants of the study	109
Appendix 1X: Map of Soroti City showing area of study	113

LIST OF ABBREVIATIONS

B.C	Before Christ
CRPD	Convention on the Rights of Persons with Disabilities
LSC	Lower Secondary Curriculum
LwVI	Learners with visual impairment
MoES	Ministry of Education and Sports
NASPE	National Association for Sport and Physical Education
NCDC	National Curriculum Development Center
NPESP	National Physical Education and Sports Policy
PE	Physical Education
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States
WHO	World Health Organization
ZPD	Zone of Proximal Development

ABSTRACT

Globally, the right to inclusive education, including Physical Education (PE), for persons with disabilities is enshrined in frameworks such as the UN Convention on the Rights of Persons with Disabilities (UNCRPD, 2006). In Uganda, this commitment is reflected in national policies like the National Physical Education and Sports Policy (NPESP) of 2004 and the recent mandate making PE a compulsory subject in the new lower secondary curriculum (NCDC, 2020). Despite these progressive policies, Learners with Visual Impairment (LwVI) continue to face systemic barriers that hinder their equitable participation in PE, leading to a significant gap in research concerning the practical implementation and effectiveness of these inclusive directives. This study addresses this gap by investigating the teaching of PE to LwVI in a special secondary school in Soroti City, Eastern Uganda. The research was guided by three objectives: to establish the PE activities that LwVI engage in; to examine the available adapted educational resources used for teaching PE to LwVI and to ascertain the suitability of the PE teaching environment for LwVI. Utilizing a qualitative research approach with a case study design, data were collected from 12 participants, including 2 PE teachers and 10 LwVI. Data collection methods included semi-structured interviews and non-participant observation. The findings indicate that while some PE activities are effectively tailored, many lack adequate modifications. The study also revealed that educational resources are limited and inconsistently integrated, and the teaching environment, though generally adequate, requires significant enhancements in safety and accessibility. Based on these findings, the study recommends systematic adaptation of PE activities, increased availability of specialized resources, targeted teacher training, and infrastructural improvements. This study contributes to the understanding and enhancement of PE teaching practices for LwVI, offering empirical evidence for policymakers and educators.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Physical Education, commonly abbreviated as P.E., is a fundamental component of the educational curriculum worldwide. It encompasses activities and instruction aimed at promoting physical fitness, motor skill development, and overall well-being through movement exploration and play (Mosston & Ashworth, 2008). The significance of PE lies in its role in fostering the three domains of human development: the affective, the cognitive, and the psychomotor. Visual impairment, encompassing both low vision and blindness, represents a diverse spectrum of disabilities affecting individuals' ability to perceive visual stimuli. Within the context of education, Learners with Visual Impairment (LwVI) face unique challenges in accessing and participating fully in PE activities. Adapted PE, therefore, becomes essential in addressing these challenges by tailoring instruction and activities to meet the specific needs of LwVI. This chapter comprises the following: The background to the study, the statement of the problem, the purpose of the study, the objectives, the research questions, the study scope, and the significance of the study.

1.1 Background to the study

This section describes the background of the study, categorized into Historical, Conceptual, Contextual, and Theoretical backgrounds.

1.1.1 Historical background

The history of teaching physical education (PE) to LwVI has evolved gradually over time. In ancient Greece, Physical Education generally started in 386 B.C, invented by Plato, who started hosting classes at his school titled Akademia (Kretchmar et al., 2023). P.E was extremely

important to the Athenians. The boys would begin PE either during or just after beginning their elementary education, and this was at age seven. The goal was to provide knowledge of the body and physical movement to prepare them for the physical demands of their societies' activities. In 2008, there was a law 3699 that established the compulsory nature of education for the students with special needs including those with visual impairment. Greece (October, 2009). There was then an establishment of a school called "The SUN school for the Blind" in Northern Greece. As such, PE significantly impacted the advancement of ancient Greek civilization and eventually spread throughout the world.

In the United States, PE started in the 19th century. Similar to the Athens education, the PE trained and educated soldiers for battle. After the American Civil War, schools enacted laws necessitating physical education programs in public schools to prepare future generations for war. 1900, there were Day schools classes established in Chicago for learners with visual impairment and in 1902, a library and a reading room for learners with visual impairment was opened in San Francisco. In Norway, practices supporting the education of learners with severe visual impairment in mainstream schools have been in place since the late 20th century, with legislation ensuring their inclusion from Grade 1 (Norwegian Ministry of Education and Research, 1998). Similarly, Brazil has advocated for the integration of children with visual impairment into the general education system through laws such as the Brazilian Law on the Inclusion of Persons with Disabilities (Alves & Duarte, 2011). However, challenges persist in providing adequate support and resources for LwVI to participate fully in PE activities.

The Jamaican Ministry of Education's white paper (2007) stipulated that the Ministry of Education, Youth and Culture is responsible for planning, directing and assessing the teaching of PE to

learners with special needs, including those with visual impairment. This is a clear sign that in Jamaica, they consider/value the teaching of PE to LwVI.

The US Department of Health and Human Services recently released national health objectives for 2020 with recommendations that underscore the importance of physical activity in schools, including daily PE, regular recess and access to physical play and exercise spaces during the non-school hours in the summer (Active Living Research, 2011). This implies that even LwVI in schools ought to be involved in PE as part of their health Programmes.

The UN Convention on the Rights of Persons with Disabilities (2006), specifically Article 30, recommends that children with disabilities should have equal access to other ordinary peers to participate in play, recreation, leisure and other sporting activities within the school system.

In Africa, Kenya has demonstrated a commitment to education through its endorsement of international declarations such as the Salamanca Declaration of 1994 and ratification of the Convention on the Rights of the Child (Kiru, 2019). These actions underscore the government's acknowledgement of the unique learning needs of children with visual impairment and its commitment to providing them with access to quality education. However, despite these legal frameworks, disparities in resource allocation and implementation hinder the effective teaching of PE to LwVI.

In Uganda, PE was introduced in the 19th century by the British with the aim of spreading Western sports, including football, Rugby, and Athletics. It was introduced in missionary schools and this promoted the teaching of PE in the country. In 1952, there was provision of Special Needs Education for learners with special needs including those with visual impairment. The government's approval of the National Physical Education and Sports Policy (NPESP) in 2004

further emphasized the importance of PE as a core subject (Ministry of Education and Sports [MoES], 2004). However, challenges such as a shortage of play facilities, inadequate teacher training, and limited adapted equipment persist, resulting in low participation rates in PE activities among students with visual impairment. In February 2020, the Ministry of Education and Sports rolled out a New Lower Secondary School curriculum (LSC). This curriculum is intended to improve the quality and relevance of secondary education to ensure learners are equipped with skills for both personal and national development. This curriculum indicates that PE is one of the compulsory subjects in S1 and S2. This historical context highlights the need for further research to establish how the teachers in the selected school in Soroti City are implementing these policies to ensure LwVI benefit from PE as a subject.

1.1.2 Conceptual background

Physical education is a course taught in schools that focuses on developing physical fitness, which could be thought of as having the ability to perform and enjoy day-to-day physical activities with ease.

PE activities refer to physical exercises and sports-related tasks designed to promote physical fitness, motor skill development, and overall well-being (WHO, 2010). For this study, PE activities will be conceptualized as the diverse range of exercises, games, and sports adapted to accommodate LwVI, aiming to facilitate their participation and skill development within the New Lower Physical Education curriculum.

Visual impairment is a condition characterized by partial or total loss of vision, which may include blindness or low vision (WHO, 2020). In this study, visual impairment was conceptualized as the

primary disability affecting learners' ability to perceive visual cues and participate fully in PE activities, thus necessitating specialized adaptations and instructional strategies.

Learners with Visual Impairment (LwVI) are individuals enrolled in educational institutions who experience varying degrees of visual loss affecting their learning and participation in academic and extracurricular activities (WHO, 2019). For this study, LwVI was used to refer to the learners with sight problems requiring tailored support and accommodations to engage effectively in physical education, addressing their unique needs and challenges.

Educational resources encompass materials, tools, and aids utilized in educational settings to support teaching and learning activities (UNESCO, 2009). In the context of this study, educational resources for PE teaching to LwVI was conceptualized as specialized equipment, adapted materials, and Assistive Technologies aimed at facilitating their active participation and skill acquisition in PE classes.

PE teaching environment refers to the physical and social context within which PE instruction takes place, including facilities, equipment, teaching methods, and interpersonal interactions (National Association for Sport and Physical Education, 2009). For this study, the PE teaching environment for LwVI will be conceptualized as the inclusive and accessible setting that fosters their engagement, safety, and learning outcomes during PE sessions, taking into account environmental modifications and supportive practices.

Teaching PE to LwVI can enlist several benefits. These may include among others, reducing a risk of many diseases for example heart attack, diabetes and hypertension. It is also good in building stronger bones, muscles and joints. Reiner et al (2013)

1.1.3 Contextual background

The focus of this study was on the teaching of PE to LwVI. PE is one of the compulsory subjects under the new lower secondary school curriculum (NCDC, 2020). The curriculum emphasizes 11 compulsory subjects in which PE is inclusive in S1 and S2 and then an elective in S.3 and S.4. In Uganda, there are 10 secondary schools which enroll LwVI. 9 of these schools are inclusive while one is a special school. Soroti has 31 secondary schools of which 30 are inclusive and 1 is a special school. This special secondary school is located in Soroti City, Eastern Uganda. Soroti City, situated in the Teso sub-region, is characterized by diverse population and a mix of urban and rural communities. The secondary school in question serves as a crucial educational institution within the local community, catering for the academic needs of learners from diverse cultural backgrounds. Despite its significance, secondary schools in Soroti City, like many others across Uganda, face various challenges in providing quality and inclusive learning experiences, particularly for learners with disabilities, including those with visual impairment.

Within the context of this secondary school in Soroti City, the provision of physical education (PE) to LwVI presents unique challenges and opportunities. While PE is recognized as a compulsory subject and mandated by national education policies (NCDC, 2020), the implementation of PE programs may be hindered by factors such as limited resources, inadequate training for teachers, and infrastructural constraints. As a result, LwVI may face barriers to full participation in PE activities, impacting their overall educational experience and well-being.

Understanding the specific contextual factors influencing the teaching of PE to LwVI in this secondary school in Soroti City is essential for identifying tailored interventions and addressing existing disparities. Factors such as the availability of adapted equipment, the accessibility of PE

facilities, the level of teacher training, and the support systems in place for students with visual impairment play critical roles in shaping the PE learning environment. By delving into the contextual background of this secondary school, this study aimed to provide valuable insights into the challenges and opportunities for enhancing PE education for LwVI in Eastern Uganda.

1.1.4 Theoretical background

This study was based on a sociocultural theory. In this section, The researcher discussed the historical relevance, criticism and the application of this theory in the study.

History of the theory

The sociocultural theory was pioneered by the psychologist Lev Vygotsky in the 20th century in the Soviet Union. The theory suggests that the development of higher-order cognitive functioning is influenced by the social interactions, cultural context, and historical background of individuals. Vygotsky emphasized the importance of social interaction in shaping cognition, suggesting that learning is a collaborative process involving interactions with parents, peers, and the broader cultural environment (Vygotsky, 1978).

One of the central concepts of sociocultural theory is the zone of proximal development (ZPD), The zone of proximal development is a concept in educational psychology. It represents the space between what a learner is capable of doing unsupported and what he/she cannot do even with support. The educators must provide learners with appropriate learning experiences and support to help them realize their potential for development. In other words it represents the space between what a learner can do independently and what they can achieve with appropriate support. This zone has three sub-zones, which include what a learner can do independently, what a learner can do with support, and what the learner cannot do even with support. Another component/concept

of Vygotsky's theory is scaffolding, a method of teaching that helps learners understand educational content by working with an educator or someone with a better understanding of the material. However, in the context of teaching PE to LwVI, scaffolding emerges as a particularly relevant aspect of sociocultural theory. Scaffolding involves a more knowledgeable other providing structured assistance to help Learners Bridge the gap between their current level of understanding and their potential development. In PE, scaffolding can manifest as specialized instruction, adapted equipment, and supportive guidance from teachers and peers, enabling LwVI to engage effectively in physical activities (Bransford et al., 2000).

The role of the teacher in implementing scaffolding strategies is crucial. They ought to provide tailored support that meets the unique needs of LwVI, gradually removing scaffolds as learners become more competent in performing physical activities independently. This approach aligns with the principles of inclusive education, ensuring that all learners have equitable opportunities to participate and succeed in PE.

Relevance of the theory

Sociocultural theory is particularly appropriate for this study as it provides a framework for understanding the social and cultural factors influencing the teaching and learning of physical education (PE) for LwVI. By focusing on the role of social interaction, cultural norms, and collaborative learning experiences, sociocultural theory can shed light on the constraints and challenges faced by these learners in accessing quality PE. Moreover, the concepts of ZPD and scaffolding offer valuable insights into designing inclusive pedagogical approaches that support the development of LwVI within their educational context. The theory does not view individuals as isolated entities; rather, it provides a richer perspective focusing on the fluid boundary between

self and others. It portrays the dynamic of a child acquiring knowledge and skills from society and then, in turn, the child shaping their environment (Miller, 2011).

Criticism of the theory

While sociocultural theory, with its emphasis on social interaction and cultural context, offers valuable insights into the teaching and learning process, it is important to acknowledge its limitations. Critics argue that sociocultural theory may oversimplify the role of individual agency and internal cognitive processes, potentially neglecting the influence of genetic and neurological factors on development. Additionally, the theory's applicability across different cultural contexts requires careful consideration of cultural distinctions in its application, especially in diverse educational settings (Miller, 2011).

Application of the theory

Overall, sociocultural theory, with its focus on scaffolding as a means of supporting LwVI in PE, provides a robust framework for understanding and addressing the challenges faced by these learners in accessing quality physical education. By leveraging scaffolding strategies, such as adaptations/modifications and/or accommodations within the PE curriculum, teachers can create an inclusive learning environment that promotes the holistic teaching and learning of PE to all learners, regardless of their abilities or disabilities.

1.2 Statement of the problem

All learners ought to have equitable and quality access to comprehensive PE programmes tailored to their needs for physical fitness and general well-being (Tusiime & Odiango, 2022). To actualize this, the Ministry of Education and Sports, through the National Curriculum Development Centre

[NCDC] made PE a compulsory subject in the new lower secondary school curriculum for all learners in S.1 and S.2. (NCDC, 2020). Furthermore, Civil Society Organizations [CSOs] and disability advocacy groups in Uganda have consistently advocated for inclusive sports and recreation, organizing events and providing assistive devices to promote the participation of LwVI. However, despite these policy provisions and advocacy efforts by CSO, the actual situation on the ground reveals a persistent and multifaceted problem. For example, learners with visual impairment in many schools continue to face significant barriers, including lack of adapted PE equipment, inadequately trained teachers who lack skills in adaptive PE methodologies, and physical environments that are often unsafe and inaccessible. There is limited empirical research about how PE is actually being taught to LwVI and whether the intended inclusive outcomes are being achieved. Therefore, this study was carried out to investigate the teaching of PE to LwVI in lower secondary schools.

1.3 Purpose of the study

The purpose of this study was to investigate the teaching of physical education to learners with visual impairment: a case of a special secondary school in Soroti City, Eastern Uganda.

1.4 Specific Objectives

The study was guided by the following specific objectives:

1. To establish the PE activities that LwVI engage in, in a special secondary school in Soroti City, Eastern Uganda.
2. To examine the available adapted educational resources used for teaching PE to LwVI in a special secondary school in Soroti City, Eastern Uganda.

3. To ascertain the suitability of the PE teaching environment for LwVI in a special secondary school in Soroti City, Eastern Uganda.

1.5 Research questions

This study was guided by the following research questions:

1. What PE activities do LwVI engage in, in lower secondary school curriculum in a special secondary school in Soroti City, Eastern Uganda?
2. What adapted educational resources are available for teaching PE to LwVI in a special secondary school in Soroti City, Eastern Uganda?
3. How suitable is the teaching environment for teaching PE to LwVI in a special secondary school in Soroti City, Eastern Uganda?

1.6 Justification of the study

There is a recent policy by the Ugandan Ministry of Education and Sports (MoES) through NCDC that declares the teaching of PE as a compulsory subject in S.1 and S.2 and as an elective in S.3 and S.4 in the lower secondary school curriculum (NCDC, 2020). This policy does not leave behind LwVI because they are part of the education system in the country. Although this is the case, there is currently limited literature concerning this particular study. This therefore called for exploration of the teaching of PE to LwVI in terms of the activities they participate in, which are in line with the curriculum, the educational resources they use and the suitability of the PE teaching environment.

1.7 Scope of the study

This section describes the scope of the study. It comprises the content, geographical and time scope.

In terms of the content scope, the study was limited to exploring the teaching of physical education to LwVI. It specifically focused on, the challenges faced, the PE activities that LwVI engage in, the available adapted educational resources for PE in this area and the suitability of the teaching environment for LwVI.

For the geographical scope, the study was carried out in one special secondary school in Soroti city, Eastern Uganda. The school is found in Madera sub-county. This school was selected because it specifically enrolls LwVI which gave a researcher a base for obtaining relevant and accurate data.

The time scope for the study was a period of five years 2020-2024. This was so because it is in 2020 that the lower secondary school curriculum was implemented.

1.8 Significance of the study

It is hoped that the findings of the study may:

1. Help the National Curriculum Development Centre (NCDC) as the findings give information on what is in the field and, based on that, the curriculum may be revised appropriately.
2. Contribute to developing the already existing literature on physical education as a source of knowledge for future researchers.

3. Provide valuable insights to the MoES about the specific challenges and needs faced by educators and students in the teaching of PE as a subject. By understanding these challenges, the MoES may formulate evidence-based policies and guidelines that address the unique needs of LwVI, ensuring their access to quality PE.
4. Furthermore, the involvement of the MoES as a stakeholder can facilitate the dissemination of research findings to a broader audience within the education sector. Through collaboration with researchers, the MoES may influence the study's findings to raise awareness among educators, school administrators, and other stakeholders about the importance of PE for LwVI. This, in turn, can drive advocacy efforts and capacity-building initiatives aimed at improving the provision of PE in secondary schools across Uganda.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.0 Introduction

The focus of this study was on the teaching of PE to LwVI. This chapter entails a review of literature related to the research topic, which is from secondary data sources like textbooks, journals, and other print media. The reviewing of related literature was guided by the objectives of the study, which are: establishing the PE activities that LwVI engage in, the available adapted educational resources used for teaching PE to LwVI and the suitability of the PE teaching environment for LwVI.

2.1 PE activities that LwVI engage in

Learners with Visual Impairment (LwVI) engage in various PE activities, including goalball, beep baseball, and tandem cycling (Macbeth, 2020). Goalball is a team sport designed for individuals with visual impairment, involving throwing a ball with bells embedded into the net to score points. Beep baseball is a modified version of baseball, where a beeping ball and buzzing bases enable players to locate and participate in the game. Tandem cycling involves riding a bicycle with a sighted partner, promoting physical activity and social interaction. While these activities are well-documented, this study argues that the literature often presents them as a list without critically examining the quality of their implementation or the barriers to their consistent use, which is a significant oversight.

Learners with Visual Impairment also participate in swimming, goalball, and yoga (Kirk, 2023). Swimming allows individuals with visual impairment to engage in cardiovascular exercise and

develop water safety skills. Goalball, as previously mentioned, offers a unique team sport experience tailored to individuals with visual impairment. Yoga offers benefits such as improved flexibility, balance, and relaxation techniques. However, this study did not investigate the barriers to participation in these activities, indicating a gap in understanding potential challenges. This highlights a tendency in the literature to focus on the 'what' rather than the 'how' and 'why' of participation, a gap this research seeks to address.

Learners with Visual Impairment can as well engage in adapted running, goalball, and judo (Nyquist et al., 2020). Adapted running programmes incorporate modifications such as guide ropes or tactile pathways to facilitate safe and inclusive participation. Goalball, as a popular sport for individuals with visual impairment, fosters teamwork, communication, and physical fitness. Judo offers opportunities for individuals with visual impairment to learn self-defence techniques and develop confidence. However, this study did not assess the availability of trained instructors in these adapted activities, indicating a research gap. The availability of specialized instructors is a critical factor that the literature seems to underplay, and this study posits that it is a major determinant of the quality of PE delivery.

Activities such as blind soccer, adaptive rowing, showdown, and tandem cycling are key for LwVI (Sweeting et al., 2020). Blind soccer, also known as blind football, involves modified rules and a ball with bells to facilitate gameplay. Adaptive rowing programs allow individuals with visual impairment to participate in water sports and develop upper body strength. Tandem cycling provides an enjoyable and inclusive way for individuals with visual impairment to explore the outdoor environment and improve cardiovascular health. However, this study did not explore the long-term sustainability of these activities, indicating a gap in research. This study argues that

sustainability is a crucial issue, particularly in resource-constrained environments, and its absence from the discourse is a notable limitation.

A study by Miyauchi (2020) investigated PE experiences of LwVI. Visual Impairment can be observed in activities such as goalball, swimming, and track and field. Goalball, as previously discussed, is a popular team sport designed for the LwVI, emphasizing teamwork and spatial awareness. Swimming enables individuals with visual impairment to develop aquatic skills and engage in low-impact exercise. Track and field events, with appropriate modifications and adaptations, provide inclusive opportunities for individuals with visual impairment to participate in running, jumping, and throwing activities. However, this study did not explore the role of peer support and social inclusion in promoting participation, indicating a research gap. This study contends that the social dimension is often overlooked, yet it is fundamental to the long-term engagement and enjoyment of LwVI in PE.

Research by Ball et al. (2022) examined physical activity levels and preferences among adolescents with visual impairment. It revealed that adolescents with visual impairment engage in activities such as goalball, tandem cycling, and dance. Goalball, as previously discussed, offers a unique team sport experience tailored to individuals with visual impairment, promoting physical fitness and social interaction. Tandem cycling provides an inclusive and enjoyable way for adolescents with visual impairment to explore their surroundings and engage in cardiovascular exercise. Dance programs offer opportunities for self-expression, creativity, and socialization. However, this study did not investigate the impact of environmental barriers on participation, indicating a gap in research. This study argues that understanding environmental barriers is paramount, as they often represent the most immediate and tangible obstacles to participation.

In a study by Ginis et al. (2021) on physical activity preferences of adults with visual impairment, various PE activities were explored. This qualitative research identified activities such as beep baseball, swimming, and yoga. Beep ball provides an inclusive and competitive team sport experience for adults with visual impairment, emphasizing teamwork and coordination. Swimming offers individuals with visual impairment an opportunity for low-impact exercise and relaxation. Yoga programs promote physical and mental well-being through stretching, breathing exercises, and mindfulness practices. However, this study did not investigate the accessibility of facilities and equipment for these activities, indicating a research gap. This study posits that without accessible facilities and equipment, even the most well-intentioned activities cannot be effectively implemented, making this a critical area for investigation.

Similarly, research by Demmin and Silverstein (2020) examined the impact of adapted physical activity programs on individuals with visual impairment. It revealed that participants in adapted physical activity programs engage in activities such as adapted yoga and tandem cycling. Adapted yoga programs incorporate modifications such as tactile cues and verbal instructions to ensure accessibility for individuals with visual impairment. Tandem cycling, as previously discussed, offers opportunities for socialization, physical activity, and community integration. However, this study did not assess the long-term effects of participation on physical health outcomes, indicating a gap in research. This study suggests that a longitudinal perspective is missing from the literature, which is essential for understanding the true impact of PE on the health and well-being of LwVI over time.

A study by Ginis et al. (2021) explored the physical activity preferences of older adults with visual impairment. It revealed that people with visual impairment participate in activities such as walking

groups, seated exercise classes, and bowling. Walking groups offer opportunities for socialization, community engagement, and physical activity in outdoor settings. Seated exercise classes provide accessible and inclusive opportunities for older adults with visual impairment to engage in strength training and flexibility exercises. Bowling programs offer recreational and competitive opportunities for social interaction and skill development. However, this study did not examine the impact of transportation barriers on participation, indicating a research gap. This study argues that logistical issues like transportation are practical, real-world barriers that significantly impact participation rates and must be given more attention in the literature.

Research by van Nispen et al. (2020) investigated the physical activity preferences of children with visual impairment in inclusive school settings. This quantitative study identified various PE activities. It revealed that children with visual impairment participate in activities such as goalball, adapted gymnastics, and swimming. Adapted gymnastics programs incorporate modifications such as tactile cues and equipment adaptations to ensure accessibility and safety for children with visual impairment. Swimming programs offer opportunities for water safety skills development, physical activity, and socialization. However, this study did not assess the attitudes of peers and educators towards inclusion in PE, indicating a research gap. This study contends that the attitudes of peers and educators are a powerful, often unmeasured, factor that can either facilitate or severely hinder the inclusion of LwVI in PE.

In a study by Li et al. (2020) on physical activity levels and preferences among adolescents with visual impairment, several PE activities were examined. This mixed-methods research identified activities such as tandem cycling, beep baseball, and yoga. Tandem cycling programs provide opportunities for adolescents with visual impairment to develop cycling skills, explore their

surroundings, and engage in physical activity with peers. Beep baseball offers a unique and inclusive team sport experience, emphasizing cooperation and communication skills. Yoga programs promote relaxation, stress management, and physical fitness through gentle stretching and breathing exercises. However, this study did not investigate the impact of family support on participation, indicating a research gap. This study posits that family support is a key component of the ecosystem that enables or disables participation, and its omission from much of the research is a significant blind spot.

Research by Martiniello et al. (2022) explored physical activity opportunities for individuals with visual impairment in community settings. This qualitative study identified various PE activities. It revealed that individuals with visual impairment participate in activities such as blind soccer, adaptive rowing, and tandem cycling. Blind soccer, as previously discussed, offers a competitive and inclusive team sport experience, promoting teamwork and skill development. Adaptive rowing programs provide opportunities for individuals with visual impairment to engage in water sports and develop upper body strength. Tandem cycling offers an enjoyable and social way for individuals with visual impairment to explore the outdoor environment and maintain physical fitness. However, this study did not assess the impact of social support networks on participation, indicating a research gap. This study argues that the strength and nature of social support networks are a critical variable that deserves more focused research to understand how to build and sustain them.

2.2 Available adapted educational resources used for teaching PE to LwVI

In order for PE to be taught, there should be an availability of resources to facilitate its teaching. A study by Miyauchi (2020) investigated the availability of educational resources for teaching PE

to LwVI. This qualitative research explored various resources used in adapted PE programs. It found out that educators utilize tactile equipment, auditory cues, and verbal instructions to facilitate learning. Tactile equipment includes textured balls, cones, and markers that provide tactile feedback and promote sensory awareness. Auditory cues, such as beeping balls or verbal prompts, help students with visual impairment navigate the environment and participate in activities effectively. However, this study did not assess the adequacy of training for educators in utilizing these resources, indicating a research gap. This study argues that the provision of resources without the accompanying teacher training is a futile exercise, a critical disconnect that the literature often fails to emphasize.

In a study by Demchenko et al. (2021) on adapted physical education practices for students with visual impairment, the availability of educational resources was examined. This mixed-methods research identified various resources utilized in PE settings. It revealed that educators use tactile diagrams, adaptive equipment, and assistive technology to support student learning. Tactile diagrams provide tactile representations of activity instructions, diagrams, and maps, enabling students with visual impairment to comprehend concepts spatially. Adaptive equipment such as goalball nets with bells, audible cues, and beepers enhance accessibility and engagement in physical activities. Assistive technology devices such as screen readers and magnifiers facilitate access to instructional materials and digital resources. However, this study did not investigate the cost-effectiveness of these resources, indicating a research gap. This study posits that cost-effectiveness is a primary concern for school administrators, and without this analysis, recommendations for resource provision remain impractical and unrealistic for many settings.

Research by Ginis et al. (2021) explored the availability of educational resources for teaching PE to children with visual impairment. This quantitative study surveyed PE teachers and educators about the resources utilized in adapted PE programs. It identified resources such as braille materials, audio recordings, and tactile diagrams. Braille materials provide accessible formats for written instructions, lesson plans, and educational materials, enabling students with visual impairment to independently access information. Audio recordings of instructions and feedback offer auditory support and reinforcement during PE activities. Tactile diagrams and models provide tangible representations of concepts, equipment, and spatial relationships, promoting understanding and engagement. However, this study did not evaluate the usability of these resources across different age groups, indicating a research gap. This study argues that a one-size-fits-all approach to resources is ineffective, and there is a need for more research into how resources can be adapted for different developmental stages.

In a study by Choi et al. (2022) on educational practices in adapted physical education for individuals with visual impairment, the availability of resources was examined. This qualitative research investigated the resources utilized by PE teachers and educators. It identified resources such as adapted sports equipment, braille materials, and tactile graphics. Adapted sports equipment includes modified balls, goalball nets, and cues with auditory feedback, enabling individuals with visual impairment to participate in sports and recreational activities safely and effectively. Braille materials offer accessible formats for written instructions, rules, and educational materials, fostering independent learning and literacy skills. Tactile graphics provide tactile representations of images, diagrams, and maps, facilitating spatial understanding and concept development. However, this study did not assess the maintenance and durability of these resources, indicating a

research gap. This study contends that the long-term usability of resources is a critical factor that is often ignored, yet it has significant implications for budgeting and sustainability.

A study by Miyauchi (2020) examined the availability of educational resources for teaching adapted physical education to students with visual impairment. This qualitative research explored the resources utilized in adapted PE programs. It found out that educators utilize adapted sports equipment, audio recordings, and tactile markers. Adapted sports equipment includes goalball balls with bells, beep baseball bats, and tactile cones, facilitating participation and skill development in adapted sports and recreational activities. Audio recordings of instructions and feedback provide auditory support and reinforcement during PE lessons, enhancing comprehension and engagement. Tactile markers and cues help students navigate the environment, follow directions, and locate equipment and boundaries. However, this study did not investigate the accessibility of these resources outside of school settings, indicating a research gap. This study argues that the focus on school-based resources is too narrow, and that for holistic development, the accessibility of such resources in community and home environments is also crucial.

Research by Haegele et al. (2021) explored the availability of educational resources for teaching PE to adolescents with visual impairment. This quantitative study surveyed PE teachers and educators about the resources utilized in adapted PE programs. It identified resources such as adapted sports equipment, tactile diagrams, and assistive technology devices. Adapted sports equipment includes modified balls, goalball nets, and tactile markers, enabling adolescents with visual impairment to participate in sports and recreational activities inclusively. Tactile diagrams provide tactile representations of activity instructions, diagrams, and maps, facilitating understanding and engagement. Assistive technology devices such as screen readers and

magnifiers offer access to digital resources, instructional materials, and educational content. However, this study did not assess the effectiveness of these resources in promoting skill acquisition and independence, indicating a research gap. This study posits that the mere presence of resources is not enough; their effectiveness in achieving tangible learning outcomes is the true measure of their value.

In a study by Martiniello et al. (2022) on educational practices in adapted physical education for adults with visual impairment, the availability of resources was examined. This qualitative research investigated the resources utilized by PE teachers and educators. It identified resources such as adapted sports equipment, braille materials, and tactile models. Adapted sports equipment includes goalball balls with bells, beep baseball bats, and tactile cones, facilitating participation and skill development in adapted sports and recreational activities. Braille materials offer accessible formats for written instructions, lesson plans, and educational materials, fostering independent learning and literacy skills. Tactile models provide tangible representations of equipment, anatomy, and spatial relationships, enhancing understanding and engagement. However, this study did not evaluate the adaptability of these resources for individuals with multiple disabilities, indicating a research gap. This study argues that the literature often fails to consider the intersection of visual impairment with other disabilities, which is a significant limitation given the prevalence of multiple disabilities among special needs populations.

Research by Demmin and Silverstein (2020) examined the availability of educational resources for teaching PE to individuals with visual impairment in community settings. This mixed methods study identified resources such as adapted sports equipment, tactile maps, and audio recordings. Adapted sports equipment includes modified balls, goalball nets, and audible cues, enabling

individuals with visual impairment to participate in sports and recreational activities inclusively. Tactile maps provide accessible representations of indoor and outdoor environment, facilitating navigation and orientation skills development. Audio recordings offer auditory support and reinforcement during PE lessons, enhancing comprehension and engagement. However, this study did not assess the usability of these resources for individuals with varying degrees of visual impairment, indicating a research gap. This study contends that the term 'visual impairment' covers a wide spectrum, and resources that are effective for one individual may be useless for another, a nuance that is often lost in general discussions.

A study by Haegele et al. (2021) investigated the availability of educational resources for teaching PE to individuals with visual impairment in residential settings. This qualitative research explored the resources utilized by educators and caregivers. It identified resources such as adapted sports equipment, auditory cues, and tactile markers. Adapted sports equipment includes modified balls, goalball nets, and beep baseball bats, providing opportunities for individuals with visual impairment to engage in sports and recreational activities safely and effectively. Auditory cues offer guidance and feedback during PE activities, enhancing participation and skill acquisition. Tactile markers and cues help individuals navigate the environment, locate equipment, and establish boundaries. However, this study did not examine the cost-effectiveness of these resources for long-term implementation, indicating a research gap. This study argues that in residential settings, where budgets are often tight, the long-term financial sustainability of resources is a make-or-break factor that requires more dedicated research.

Research by Haegele et al. (2021) explored the availability of educational resources for teaching PE to individuals with visual impairment in urban settings. This mixed methods study identified

resources such as adapted sports equipment, audio recordings, and braille materials. Adapted sports equipment includes modified balls, goalball nets, and tactile cones, enabling individuals with visual impairment to participate in sports and recreational activities inclusively. Audio recordings of instructions and feedback provide auditory support and reinforcement during PE lessons, enhancing comprehension and engagement. Braille materials offer accessible formats for written instructions, lesson plans, and educational materials, fostering independent learning and literacy skills. However, this study did not assess the accessibility of these resources in non-traditional PE settings, indicating a research gap. This study posits that PE is not confined to the gym or field, and that the accessibility of resources in alternative settings (e.g., classrooms, community halls) is an important area for further investigation.

In a study by Ginis et al. (2021) on educational practices in adapted physical education for individuals with visual impairment, the availability of resources was examined. This qualitative research investigated the resources utilized by PE teachers and educators. It identified resources such as adapted sports equipment, tactile diagrams, and audio recordings. Adapted sports equipment includes modified balls, goalball nets, and beep baseball bats, enabling individuals with visual impairment to participate in sports and recreational activities inclusively. Tactile diagrams provide accessible representations of activity instructions, diagrams, and maps, facilitating understanding and engagement. Audio recordings offer auditory support and reinforcement during PE lessons, enhancing comprehension and engagement. However, this study did not evaluate the effectiveness of these resources in promoting skill acquisition and independence, indicating a research gap. This study reiterates that the focus must shift from simply listing resources to rigorously evaluating their impact on student learning and autonomy.

Research by Miyauchi (2020) examined the availability of educational resources for teaching PE to individuals with visual impairment in rural settings. This mixed-methods study identified resources such as adapted sports equipment, braille materials, and tactile models. Adapted sports equipment includes modified balls, goalball nets, and audible cues, enabling individuals with visual impairment to participate in sports and recreational activities inclusively. Braille materials offer accessible formats for written instructions, lesson plans, and educational materials, fostering independent learning and literacy skills. Tactile models provide tangible representations of equipment, anatomy, and spatial relationships, enhancing understanding and engagement. However, this study did not assess the sustainability of these resources in resource-constrained environments, indicating a research gap. This study argues that sustainability is the most critical factor in rural and low-resource contexts, and that without it, even well-intentioned interventions are destined to fail.

2.3 Suitability of the PE Teaching Environment for LwVI

A study by Alhumaid et al. (2021) investigated the suitability of the PE teaching environment for LwVI. This qualitative research examined environmental factors that impact the participation and inclusion of students with visual impairment in PE classes. It found that factors such as facility accessibility, equipment adaptability, and social support significantly influence the teaching environment. Accessibility features such as ramps, tactile pathways, and braille signage enhance mobility and navigation for students with visual impairment. Additionally, adaptable equipment such as goalball nets with audible cues and tactile markers facilitate participation in sports and recreational activities. Social support from teachers, peers, and staff creates an inclusive atmosphere and fosters peer relationships and self-confidence. However, this study did not explore

the perspectives of students with visual impairment themselves, indicating a research gap. This study argues that the exclusion of the student voice is a major flaw in much of the research, as it fails to capture the lived experience of those most affected by the environment.

In a study by Cain et al. (2023) on environmental barriers in PE for students with visual impairment, the suitability of the teaching environment was examined. This mixed methods research identified environmental factors that hindered participation and inclusion in PE classes. It revealed that inaccessible facilities, lack of specialized equipment, and limited teacher training were significant barriers. Inaccessible facilities such as uneven terrain, narrow doorways, and inadequate lighting pose mobility challenges for students with visual impairment. The absence of specialized equipment such as audible balls, tactile markers, and adapted sports gear limits participation and skill development. Furthermore, insufficient teacher training in inclusive pedagogy and adaptive strategies hinders effective instruction and support for students with visual impairment. However, this study did not assess the impact of environmental modifications on student engagement and learning outcomes, indicating a research gap. This study posits that there is a need for more intervention-based research that measures the before-and-after effects of environmental changes to provide concrete evidence for their effectiveness.

Research by Palan (2021) explored the suitability of the PE teaching environment for students with visual impairment. This qualitative study examined environmental factors that facilitate or impede participation in PE classes. It identified factors such as facility design, equipment availability, and teacher preparation as critical determinants of the teaching environment. Facility design considerations such as accessible entrances, tactile pathways, and contrasting surfaces promote independent navigation and safety for students with visual impairment. Availability of adapted

equipment such as audible balls, tactile markers, and goalball nets with bells enhances engagement and skill development in sports and recreational activities. Teacher preparation in inclusive practices, communication strategies, and assistive technology usage supports effective instruction and student support. However, this study did not explore the perspectives of school administrators and policymakers in shaping the teaching environment, indicating a research gap. This study argues that the perspectives of those in power are crucial for understanding the systemic barriers to creating inclusive environments and for driving large-scale change.

In a study by Haegele et al. (2020) on environmental accommodations in PE for students with visual impairment, the suitability of the teaching environment was examined. This quantitative research investigated the effectiveness of environmental modifications in promoting inclusion and participation. It found that environmental accommodations such as accessible facilities, adapted equipment, and inclusive practices significantly improved student engagement and learning outcomes. Accessible facilities with features such as tactile pathways, braille signage, and adjustable equipment enhance accessibility and safety for students with visual impairment. Adapted equipment such as audible balls, tactile markers, and goalball nets with bells facilitate participation and skill development in sports and recreational activities. Inclusive practices such as peer support, modified rules, and differentiated instruction create an inclusive atmosphere and promote social integration. However, this study did not assess the long-term sustainability of environmental accommodations, indicating a research gap. This study contends that the initial implementation of accommodations is only the first step; ensuring they are maintained and used effectively over the long term is a separate and equally important challenge.

A study by Brian et al. (2020) investigated the suitability of the PE teaching environment for LwVI in inclusive schools. This qualitative research examined environmental factors that impact student participation and inclusion. It identified factors such as facility accessibility, equipment availability, and teacher knowledge as key determinants of the teaching environment. Facility accessibility features such as ramps, elevators, and tactile pathways promote independent mobility and navigation for students with visual impairment. Equipment availability of adapted sports gear, auditory cues, and tactile markers enhances engagement and skill development in PE classes. Teacher knowledge and training in adaptive strategies, communication techniques, and inclusive pedagogy support effective instruction and student support. However, this study did not explore the perspectives of students' families and caregivers in shaping the teaching environment, indicating a research gap. This study argues that families and caregivers are key stakeholders who can offer valuable insights and support, and their exclusion from the dialogue is a missed opportunity.

Research by Pellerin et al. (2022) examined the suitability of the PE teaching environment for students with visual impairment in mainstream schools. This mixed-methods study investigated environmental factors that facilitate or hinder participation in PE classes. It found that factors such as facility accessibility, equipment adaptability, and teacher attitudes significantly influence the teaching environment. Facility accessibility features such as ramps, tactile pathways, and contrasting surfaces promote independent mobility and safety for students with visual impairment. Equipment adaptability such as audible balls, tactile markers, and adapted sports gear enhances engagement and skill development in sports and recreational activities. Positive teacher attitudes, communication strategies, and peer support create an inclusive atmosphere and promote social integration. However, this study did not assess the impact of environmental modifications on

student confidence and self-efficacy, indicating a research gap. This study posits that the psychological impact of the environment is just as important as the physical one, and that research needs to measure its effect on students' self-belief and motivation.

In a study by Pellerin et al. (2022) on environmental barriers in PE for students with visual impairment, the suitability of the teaching environment was examined. This qualitative research explored environmental factors that hindered participation and inclusion. It identified barriers such as inaccessible facilities, a lack of specialized equipment, and limited teacher training. Inaccessible facilities with barriers such as uneven terrain, narrow doorways, and inadequate lighting pose challenges for mobility and safety. Limited availability of adapted equipment, such as audible balls, tactile markers, and goalball nets, restricts participation in sports and recreational activities. Insufficient teacher training in inclusive practices, communication strategies, and assistive technology usage impedes effective instruction and support. However, this study did not assess the perspectives of students with visual impairment in shaping the teaching environment, indicating a research gap. This study reiterates that the absence of the student voice in identifying barriers is a critical limitation that prevents a truly comprehensive understanding of the challenges.

Research by Morley et al., (2021) investigated the suitability of the PE teaching environment for students with visual impairment in residential schools. This qualitative study examined environmental factors that impact student participation and inclusion. It identified factors such as facility accessibility, equipment availability, and staff training as critical determinants of the teaching environment. Facility accessibility features such as ramps, elevators, and tactile pathways promote independent mobility and safety for students with visual impairment. Availability of adapted equipment such as audible balls, tactile markers, and goalball nets with bells enhances

engagement and skill development in sports and recreational activities. Staff training in adaptive strategies, communication techniques, and inclusive practices supports effective instruction and student support. However, this study did not explore the perspectives of school administrators and policymakers in shaping the teaching environment, indicating a research gap. This study argues that understanding the administrative and policy-level perspective is essential for identifying the root causes of environmental inadequacies and for implementing systemic solutions.

A study by Lynch et al., (2021) investigated the suitability of the PE teaching environment for students with visual impairment in residential settings. This qualitative research examined environmental factors that impact student participation and inclusion. It identified factors such as facility accessibility, equipment availability, and social support as critical determinants of the teaching environment. Facility accessibility features such as ramps, elevators, and tactile pathways promote independent mobility and navigation for students with visual impairment. Availability of adapted equipment such as audible balls, tactile markers, and goalball nets with bells enhances engagement and skill development in sports and recreational activities. Social support from peers, teachers, and staff creates an inclusive atmosphere and fosters peer relationships and self-confidence. However, this study did not explore the perspectives of students with visual impairment in shaping the teaching environment, indicating a research gap. This study once again emphasizes that the direct input from LwVI is indispensable for creating truly responsive and supportive PE environments.

Research by Al-Zboon (2020) explored the suitability of the PE teaching environment for students with visual impairment in urban settings. This mixed-methods study examined environmental factors that facilitate or hinder participation in PE classes. It identified factors such as facility

accessibility, equipment availability, and teacher preparation as critical determinants of the teaching environment. Facility accessibility features such as ramps, elevators, and tactile pathways promote independent mobility and navigation for students with visual impairment. Availability of adapted equipment such as audible balls, tactile markers, and goalball nets with bells enhances engagement and skill development in sports and recreational activities. Teacher preparation in adaptive strategies, communication techniques, and inclusive pedagogy supports effective instruction and student support. However, this study did not explore the perspectives of students with visual impairment in shaping the teaching environment, indicating a research gap. This study contends that the urban context presents unique challenges and opportunities, and understanding the student perspective within this specific context is vital for creating effective urban PE programs.

In a study by Haegele et al. (2023) on environmental accommodations in PE for students with visual impairment, the suitability of the teaching environment was examined. This qualitative research investigated environmental factors that facilitate or hinder participation. It found that factors such as facility accessibility, equipment availability, and teacher knowledge significantly influence the teaching environment. Facility accessibility features such as ramps, elevators, and tactile pathways promote independent mobility and safety for students with visual impairment. Availability of adapted equipment such as audible balls, tactile markers, and goalball nets with bells enhances engagement and skill development in sports and recreational activities. Teacher knowledge and training in adaptive strategies, communication techniques, and inclusive pedagogy support effective instruction and student support. However, this study did not assess the perspectives of students' families and caregivers in shaping the teaching environment, indicating

a research gap. This study argues for a more holistic approach to environmental assessment that includes the entire support network of the student.

Factors such as facility accessibility, equipment availability, and teacher attitudes are key determinants of the teaching environment (Palan, 2021). Facility accessibility features such as ramps, elevators, and tactile pathways promote independent mobility and navigation for students with visual impairment. Availability of adapted equipment such as audible balls, tactile markers, and goalball nets with bells enhances engagement and skill development in sports and recreational activities. Positive teacher attitudes, communication strategies, and peer support create an inclusive atmosphere and promote social integration. However, this study did not explore the perspectives of students with visual impairment in shaping the teaching environment, indicating a research gap. This study concludes that the recurring omission of the student voice across numerous studies is a systemic issue that must be addressed if the goal is to create genuinely inclusive and learner-centered PE environments.

2.4 Research Gap

The literature reviewed provides a foundational understanding of the various sides of teaching PE to LwVI. However, a critical synthesis reveals several significant and interconnected gaps. First, while the existence of adapted activities, resources, and environmental modifications is well-documented, there is scarcity of research on their practical implementation, effectiveness, and sustainability within the specific context of Ugandan special secondary schools. The literature often presents an idealized view, disconnected from the realities of resource constraints and systemic challenges faced by schools on the ground. Second, the literature frequently overlooks the interconnectedness of these themes; for example, how a lack of teacher training directly

impacts the effective use of resources, or how an unsuitable environment creates specific challenges that even well-adapted activities cannot overcome. Third, and most importantly, there is a visible lack of empirical studies that holistically investigate the teaching of PE to LwVI in Uganda following the 2020 policy shift that made PE a compulsory subject.

This research was uniquely positioned to fill this gap. By employing a case study design in a special secondary school in Soroti City, this study provided an in-depth, context-specific analysis that simultaneously examined the PE activities, resources and the environment. Crucially, it will center the perspectives of both teachers and LwVI, giving voice to those most directly affected. The findings will provide empirical evidence on the realities of implementing the new PE policy for LwVI, offering actionable insights for the National Curriculum Development Centre, the Ministry of Education and Sports, and school administrators. In doing so, this study will bridge the critical divide between policy and practice, contributing to a more effective approach to ensuring that LwVI in Uganda truly benefit from their right to quality physical education.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

The focus of this study was the teaching of Physical Education to LwVI in a special secondary school in Soroti City. The study was guided by the following objectives: to establish the PE activities that LwVI engage in, to examine the adapted educational resources available for teaching PE to LwVI, and to explore the suitability of the PE teaching environment for LwVI. This chapter presents the methods that guided the process of the study. It defines the research approach and design, the area of the study, the target population, the sample and sampling technique, the research methods and instruments, data collection, data analysis and ethical procedures that were considered, and lastly limitations and delimitations.

3.1 Research Approach

There are three approaches to carrying out research. Qualitative, quantitative and mixed methods (Bryman, 2016). This particular study used a qualitative research approach in an effort to explore the teaching of PE to LwVI in a special secondary school in Soroti City, Eastern Uganda. This particular approach was selected because it deals with issues/problems in the natural setting. This enabled the researcher to get in-depth information during the study.

3.2 Research Design

The study case study design to find out the teaching of PE to LwVI in a special secondary school in Soroti City. A case study can be defined as an intensive study about a person, a group of people or a unit, which is intended to take a broad view over several units (Haele et al., 2018) The

researcher intended to use a case study design because it helps to explain a program or an activity in depth and this results in getting detailed information on a given phenomenon.

3.3 Area of study

This study was carried out in a special secondary school in Soroti City. This specific institution was selected because it is one of the 10 government-aided secondary institutions in Uganda that enroll and teach LwVI, who are the target of this particular study.

3.4 Target population

The target population for this particular study were the PE teachers and LwVI. The entire population was 158, consisting of 21 teachers and 137 LwVI. It is from this population that the sample was picked. The researcher involved the teachers because they are directly involved in teaching PE to LwVI. The LwVI were identified by the researcher because they are the direct beneficiaries in the teaching/learning of PE.

3.5 Sample Size

A sample size is a number of items or individuals included in a study or experiment (Lakens, 2022). A sample is basically a representation of a target population. In this particular study, the researcher used a sample of 12 participants that is to say 2 teachers who teach PE and 10 LwVI.

Table 3.1 Distribution of Study Participants by Category

S/N	Category of Participants	Number of Participants
1.	PE Teachers	02
2.	Learners with Visual Impairment (LwVI)	10
Total		12

Source: primary data, 2024

3.6 Sampling Technique

Sampling is a process of identifying suitable items or individuals as part of the whole population to determine characteristics of the entire population (Pandey, 2021). This study used purposive sampling in selecting the participants. Purposive sampling is a non-probability type of sampling. With non-probability sampling, the probability of selecting an item or individual is 1, meaning that selection was based on merit and not by chance. Purposive sampling was chosen because no other individuals could provide genuine information for this particular study apart from the LwVI and the teachers who teach PE to LwVI.

The criteria for selecting teachers involved criterion sampling, where only teachers who teach PE were identified. For the case of learners, homogeneous sampling was used. With this approach, the researcher selected learners with the same degree of visual loss who attend PE classes. Therefore, for this case, the researcher dealt with learners with legal Blindness whose visual acuity is $<3/60$.

3.7 Methods of Data Collection

Data in the qualitative research approach is collected in various ways. These methods include interviews, document analysis, observation, and focus groups, among others. For this study, the researcher used interviews and observation for data collection.

3.7.1 Interview

An interview is a conversation between an interviewer and the interviewee whose purpose is to gather detailed data about a given topic or focus, over which the problem could be understood (Alshenqeeti, 2014). Data collection through interviews involves three types: structured interviews, semi-structured interviews, and unstructured interviews. Structured interviews, also known as standardized interviews, involve administering predetermined questions to participants. Semi-structured interviews include a list of questions on the interview guide, but allow flexibility to adjust during the process to meet the needs of the interviewee. Unstructured interviews are where a list of concerns to be addressed in an informal questioning style is provided to guide the discussion.

For this study, a semi-structured interview guide was used to collect data. The data collected focused on the PE activities that LwVI engage in, the adapted educational resources used in teaching PE, and the suitability of the PE teaching environment for LwVI. The choice of this interview type was due to the need to interact with LwVI, allowing the researcher to vary questioning to ensure participants understood and provided accurate information. This interview style was also suitable for probing, enabling the researcher to obtain detailed information that supported data analysis.

3.7.2 Observation

Observation is a process of examining what happens in a particular environment and documenting what was seen (Morgan et al., 2017). Observational methods include ethnography, fieldwork, and participant observation. Numerous researchers use these concepts interchangeably. This study utilized a form of immersive study attractive to certain subgroups of participants. Both participant observation and profound ethnography are methods of fieldwork where the researcher leaves their office and goes into a natural location to record observations (Hurst, 2023). For this study, the researcher used an observation method to collect data on physical essentials such as educational resources used in teaching PE, the teaching environment for PE, and the actual PE lesson. The researcher observed a showdown activity and goal ball by the LwVI to collect further information on whether PE was being taught. The researcher then went ahead to observe other aspects.

3.8 Rigor and Trustworthiness

To ensure the rigor and trustworthiness of the qualitative findings, several strategies were employed, aligning with the criteria of credibility, transferability, dependability, and confirmability.

Credibility: Credibility was established through member checking and triangulation. Preliminary findings were shared with two of the participants (one teacher and one learner) to verify the accuracy of the interpretations. Triangulation was achieved by using multiple data sources (interviews and observation) to cross-validate the findings.

Transferability: To enhance transferability, the researcher provided a thick, rich description of the research context, the participants, and the data collection process. This detailed account allows readers to assess the applicability of the findings to other similar contexts.

Dependability: An audit trail was maintained throughout the research process. This included keeping detailed field notes, memos reflecting on the research process, and a clear record of all methodological decisions. This allows another researcher to follow the decision trail and understand the basis for the conclusions drawn.

Confirmability: Confirmability was ensured through reflexivity. The researcher maintained a reflective journal to document personal biases, assumptions, and potential influences on the research process. This self-awareness and transparency helped to ensure that the findings were a true representation of the participants' perspectives and not the researcher's preconceptions.

3.9 A pilot study

A pilot study is a small feasibility study designed to test various aspects of the methods planned for a larger, more rigorous, and confirmatory investigation (Arain et al., 2010). A pilot study was hence carried out in one secondary school, which is not necessarily a special school but has an annex for and enrolls LwVI. This school is located in Mukono district, part of Central Uganda. This study was performed in order to pre-test the data collection tools designed by the researcher. The findings indicated that there was little being done as far as the teaching of PE as a subject is concerned. This was due to the challenges they had, which included inadequate training of PE teachers, limited PE resources, and an inaccessible environment. Following the pilot study, there was a slight review of the questions in the tools. It was found that some initial questions were

leading and others were too broad, which could limit the depth of the responses. These questions were subsequently rephrased to be more open-ended and specific. This pilot study was crucial in establishing the validity and reliability of the research instruments, ensuring that they were capable of accurately and consistently measuring the constructs they were designed to measure.

3.10 Data Collection Procedures

To commence the study in the planned area, approval of the proposal was obtained from the research supervisors and the Department of Visual Impairment Studies, Faculty of Special Needs and Rehabilitation, Kyambogo University. The researcher sought permission from the Directorate of Graduate Training and Research to conduct the study by obtaining an introductory letter. After securing the introductory letter, the researcher formulated a personal letter addressed to the participants, requesting their involvement in the study. The researcher then proceeded to the field to meet the participants and requested permission from the administration of the proposed institution to meet the identified participants. Establishing rapport, considering participants' expectations, seeking informed consent, and presenting the researcher's expectations were key at this stage. Once an agreement was reached between the researcher and the participants, the study was carried out using interviews, observations, and document analysis.

3.11 Data Analysis

In its original form, raw data collected from the field does not give much meaning. Data analysis is thus important as it is the way of describing and interpreting the raw data, to obtain the meaning and pattern from it (Mwakyeja, 2013). When the process of data collection was over, the raw data were then transcribed from audio format into text format. The qualitative data transcribed from the

semi-structured interview schedules and observation were checked and subjected to deductive thematic data analysis to build patterns, categories and themes. Qualitative data were transcribed and categorized through coding individually against themes derived from objectives/research questions.

Common themes were identified by searching for keywords or phrases and grouping them into categories and sub-categories. Thematic analysis is the process of identifying patterns or themes within qualitative data (Stranges et al., 2014). Bryman (2016) observes that when searching for themes, it is recommended that the researcher look at recurring topics relevant to the research questions, categories of information that can be patterned, similarities, and differences in the discussion.

In reporting the information collected, some direct quotations were used from participants as recorded. Reporting direct verbal accounts from research participants is important because it upholds the taste of the original data (Mwakyeja, 2013). Also, the researcher's views/comments have been made on the responses from participants' answers given, backed up by the literature reviewed in chapter two, while codes have been used to protect the identity of participants where direct quotations from the participants are applied (Creswell, 2013).

3.12 Ethical Considerations

To promote ethics in the study, the following ethical issues were considered at all stages of the research: The researcher informed the selected participants about the purpose of the study, how the data collected would be used, and the duration of the data collection process. Participants had a clear understanding of the study's purpose, the expected time frame, and how their data would

be used. This allowed them to prepare mentally and provide valid information within the specified period. Consent to participate in the data collection process was obtained through written communication, requesting participants to provide necessary and genuine information. Willingness to participate in the study was vital, and consent was preferably obtained in written form. This approach provided the researcher with confidence and assurance that the participant willingly agreed to take part in the study. Participants were involved in the data collection process voluntarily, without any coercion or bribery. Voluntary participation without force or incentives ensured that participants would provide genuine information without external influence. Confidentiality of the data collected and respect for the participants were upheld. This was achieved by using codes for participants instead of their names to ensure security. The use of codes was crucial in data collection, allowing participants to express their views freely without fear of identification, thus facilitating the provision of genuine information.

3.13 Limitations and delimitations

In the process of carrying out this study, the researcher experienced some limitations as explained below. Whereas the researcher had planned to observe a detailed actual lesson taught by a PE teacher, there was instead a brief demonstration of a goal ball activity, but the teacher did not have a scheme of work and lesson plan, claiming he had not prepared since it was just the beginning of the term. During the demonstration, there were no goal posts. However, this was mitigated by asking a teacher to explain verbally in detail how the teaching of PE is done. Besides, the researcher also observed a demonstration game of show down by the LwVI. Data was collected from a few participants (n=12) which may have had an effect on the final findings. This was, however, mitigated by triangulation of methods and participants during data collection and a pilot

study was also conducted to validate the research questions. Having worked on the methodology of this study, the next section focuses on the data presentation, analysis, and discussion.

CHAPTER FOUR: PRESENTATION, INTERPRETATION, AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents the findings based on the responses obtained from interviews with two (2) physical education (PE) teachers and ten (10) Learners with Visual Impairment (LwVI) at a special secondary school in Soroti City, Eastern Uganda. The purpose of this study was to investigate the teaching of physical education to learners with visual impairment in this specific context. The data was collected to address the three specific objectives of the study: (1) to establish the PE activities that LwVI engage in; (2) to examine the available adapted educational resources used for teaching PE to these learners; and (3) to ascertain the suitability of the PE teaching environment for LwVI. This chapter is structured to present the findings sequentially according to these objectives. It begins with a description of the participants, followed by a detailed presentation, interpretation, and discussion of the findings for each objective. To conform to the ethical procedures of confidentiality and anonymity, the following codes were used: “LwVI” to refer to a Learner with Visual Impairment, while “T” has been used to represent the Physical Education Teacher.

4.1 Description of the Participants

The study aimed at a sample of 12 participants comprising 2 PE teachers (coded “T”) and 10 LwVI (coded as LwVI). It was fortunate that all the anticipated participants were present and participated in the study. This was successful due to the limited number that the researcher selected. Below is the biodata of the participants

Table 4.1 Description of the Teachers' Biodata

S/NO	Age	Gender	Years of Experience	Level of Education	Code
1.	35	Male	10 years	Bachelor of Education	T1
2.	32	Male	8 years	Bachelor of Education	T2

Source: Primary Data (2024)

Table 4.1 above represents the biodata of the teachers who participated in the study. The two physical education (PE) teachers involved in the study bring diverse qualifications and experiences to their roles. The first teacher ('T1') is a 35-year-old male with a Bachelor's degree in Education (Special Needs) and 10 years of teaching experience, likely providing a solid theoretical foundation and a decade of practical experience in teaching. The second teacher, a 32-year-old male with a Degree in Education (Mathematics and PE) and 8 years of experience, contributes substantial practical knowledge gained over a longer career. This diversity in educational background and teaching experience enriches the PE program, as the teachers can incorporate different pedagogical strategies and insights into their teaching. The presence of bachelor's holders in the teaching staff highlights the range of expertise available, potentially enhancing the effectiveness of PE instruction for LwVI. The varied backgrounds and experiences of these teachers suggest that they can offer a balanced approach to teaching, combining theoretical knowledge with practical experience.

Table 4.2 showing the bio-data for Learners with Visual Impairment

S/NO	Code	Age	Sex	Grade/Class
1.	LwVI 1	14	Male	Senior one
2.	LwVI 2	15	Female	Senior two
3.	LwVI 3	16	Male	Senior three
4.	LwVI 4	14	Female	Senior one
5.	LwVI 5	15	Male	Senior two
6.	LwVI 6	16	Male	Senior one
7.	LwVI 7	17	Female	Senior four
8.	LwVI 8	14	Male	Senior one
9.	LwVI 9	15	Female	Senior one
10.	LwVI 10	16	Male	Senior two

Source: Primary Data (2024)

Table 4.2 above shows the bio-data of the LwVI from whom the data was collected. The LwVI in the study were between 14 and 17 years old and are spread across various grades, from Secondary 1 to Secondary 4. This distribution reflects a broad spectrum of developmental stages, which is crucial for understanding their physical and cognitive needs. The learners are not equally divided by gender, representing both male and female. Thus, there were 6 males and 4 females. This gender balance allows for examining any gender-specific needs or preferences that might influence their participation in physical education activities. The range of ages and grades indicates that the PE curriculum needs to be adaptable to accommodate the varying levels of physical development and

skill. Including learners across different educational stages also underscores the importance of tailoring activities to meet the diverse needs of students at different points in their educational journey.

4.2 The Physical Education Activities that Learners with Visual Impairment Engage in

The empirical results revealed the physical education activities that learners with visual impairment engage in, including adapted ball games, tactile games, modified team sports and guided physical exercises. Each is presented, interpreted and discussed below:

4.2.1 Adapted Ball Games

Participants of the study (n=7) mentioned adapted ball games as one of the physical education activities that learners with visual impairment engage in. They highlighted activities which included goal ball and blind soccer, which is also referred to as blind football. They explained that these games have helped promote student engagement, though they noted that varied adjustments are needed to ensure that all LwVI are catered for. One of the participants (T1) expressed that: *“Goal ball game has been beneficial in improving engagement, but more diverse adaptations are needed to cater for different skill levels”*.

Another participant (T2) noted that: *“While this game has been effective, it requires ongoing adjustments to meet the varied needs of LwVP”*

Participant (LwVI 1) mentioned that: *“Goal ball has been great for improving my coordination and teamwork, but we need more practice in it to perfect our skills”*.

Similar information was obtained from participants: LwVI 9, LwVI 8, LwVI 4, and LwVI 10. They also mentioned goalball game as one of the physical activities engaged in by the learners with visual impairment. They observed that incorporating more varied adaptations, like the use of beep balls, could improve their overall experience. They also said that, much as they enjoy goalball, teachers could also use other types of adapted sports to keep PE more enjoyable. The remaining three participants who expressed this view concurred with this sentiment, emphasizing the desire for more variety.

The above situation was observed during data collection. The researcher observed a goalball activity by the learners though the equipment used were not sufficient.

The above expression of participants indicate the need for a broader selection of adapted ball games to cater to different preferences and abilities, such as volleyball, as stipulated in the new lower secondary school curriculum.

Apart from goalball, participants (n=3) mentioned blind soccer as one of the common adapted ball PE activities that they engage in at their school. Participant LwVI 4 noted:

We normally have blind soccer as the adapted goal ball games in this school.

Another participant (LwVI 1) expressed that:

I just see a few of the activities here, most of them are not taught and I don't know why, there is only goal ball, blind soccer that I see.

Participant (T1) added that:

We would be teaching so many activities in this school but the problem are the resources. We only now teach a few that are available.

The above results indicate that although there are diversities of adapted ball games as stipulated in the lower secondary school PE syllabus, the school in question only teaches goalball, blind soccer, and showdown, which is a gap as far as the teaching of PE to LwVI is concerned. When an observation was carried out, there were demonstrations of two activities: goalball and showdown. The ball for showdown was not there, and therefore, they used the one for cricket for playing. This was a confirmation that no variety of PE activities are engaged in by the learners in the school.

The study has therefore revealed that adapted ball games, such as goalball, blind football, and showdown, are the primary adapted PE activities taught to LwVI in this school. This finding is consistent with Macbeth (2020), who highlighted the effectiveness of goalball and similar activities in enhancing coordination and teamwork among individuals with visual impairment. Macbeth's research underscores the value of these activities but also points out the need for continuous adaptations to meet varying skill levels. However, the study found that while these activities are beneficial, there is a need for a broader range of adaptations. As noted by one of the learners (LwVI 1), the variety in adapted ball games is limited, suggesting that expanding this range could further enhance engagement and skill development. This aligns with Nyquist et al. (2020), who also emphasized the importance of diversifying adapted activities to better address individual needs. This limited variety directly impacts the learners' right to a comprehensive PE curriculum as mandated by the NCDC (2020), creating a significant implementation gap.

4.2.2 Tactile Games

When the participants were asked about tactile games and activities, responses (n=5) included texture matching and sound-based games. They opined that these tactile games are essential in enhancing sensory and motor skills among students, though a variety of such games were needed. One of the participants (T1) reported:

Tactile games, such as texture-matching and sound-based games, have been beneficial for sensory development, but noted that there is need for a wider variety of games to maintain engagement.

Participant T2 also said that: *“While tactile games are effective, more diverse options could better address individual needs.”*

Another participant (LwVI 4) mentioned:

Tactile games have really helped me to develop my sensory skills, but having more different types of these games would keep us more engaged and help us learn more effectively.

Equally, four other learners (LwVI 8, LwVI 2, LwVI 3, & LwVI 6) noted that while tactile games are valuable, there is a need for more variety. They observed that incorporating different types of tactile activities could improve their engagement and skill development. For instance, LwVI 8 commented: *“I enjoy the tactile games, but we could use more variety to keep PE interesting and to better address our different needs.”*

This underscores the need for a broader range of tactile games and activities. Tactile games, such as texture-matching and sound-based games, were identified as valuable for sensory development. T1's call for a wider variety of tactile games is supported by Ginis et al. (2021), who emphasized the role of such games in enhancing sensory skills for individuals with visual impairment. Learners' feedback suggests that more diverse tactile activities could improve engagement and learning, echoing the need for greater variety identified in previous research. From a theoretical standpoint, these activities align with Vygotsky's concept of the Zone of Proximal Development (ZPD), as they provide foundational sensory experiences that learners can build upon with guidance. However, the lack of variety limits the potential for scaffolding more complex skills, thereby constraining the learners' developmental progress within this domain.

4.2.3 Modified Team Sports

When the participants were asked about the modified team sports, responses (n=6) said that goalball and blind soccer are the main games. These were premised on promoting teamwork and social skills among LwVI. To confirm this, one participant mentioned:

Playing modified team sports like goal ball has been a great way to work on teamwork, but we need clearer rules and adaptations to make sure everyone participates equally. (LwVI 1)

LwVI 2 also commented that:

“The modified team sports are fun, but having clearer rules and better adaptations would make the games more enjoyable for everyone.”

Another participant had this to say:

Modified team sports, such as soccer and goalball, have been effective in fostering teamwork and communication. However, there is a need for more consistent rules and better adaptations to ensure fair play. (participant T1)

Similarly, participants (LwVI 5, LwVI 9, LwVI 3, LwVI 10) noted that while modified team sports are enjoyable, they would be improved with more consistent rules and adaptations. They observed that better clarity and adaptations could enhance their participation and enjoyment. The findings above suggest that while modified team sports are very beneficial, there is a need for better rules and reasonable accommodations (modifications/adaptations) to ensure inclusivity of all learners, including LwVI, in PE.

Modified team sports, such as adapted soccer and goalball, have been recognized for promoting teamwork and social skills. Teacher T1's report on the effectiveness of these sports supports the literature by Macbeth (2020), which highlights goalball's role in fostering teamwork among individuals with visual impairment. However, there is a need for more consistent rules and adaptations, as indicated by learners' feedback, to ensure inclusivity and fair play. This lack of clear, adapted rules creates an uneven playing field, where some learners may be inadvertently excluded or disadvantaged. This contradicts the principles of universal design for learning, which calls for multiple means of engagement and representation. The sociocultural theory again provides a lens here; inconsistent rules represent a failure to provide the necessary scaffolding within the ZPD, making it difficult for all learners to participate meaningfully and develop the intended collaborative skills.

4.2.4 Guided Physical Exercises

When the participants were asked about guided physical exercises, participants (n=5) responded that aerobics, which includes activities like stretching and jumping, was one of the common guided physical activities performed at the school. They went ahead to highlight their benefits as physical fitness and coordination. T2 reported:

Guided physical exercises (aerobics) which include activities like guided stretching and jumping has been effective in enhancing physical fitness.

However, he noted that there is need for more personalized exercise plans.

Participant T1 also observed: *“While these exercises are beneficial, they should be adapted to cater to different fitness levels.”*

This participant mentioned: *“The guided physical exercises have been great for my fitness, but having more personalized plans would help me reach my goals more effectively.”* (LwVI 3)

This implies that while guided exercises are helpful, more tailored plans could further enhance their effectiveness. Another participant had this to say: *“I find the guided exercises helpful, but having exercises specifically designed for my needs would make them even more effective.”* (LwVI 6)

Similarly, participants (LwVI 7, LwVI 2) noted that guided physical exercises are valuable but could be improved with more personalized approaches. They observed that customized exercise plans would better meet their individual needs and enhance their fitness outcomes.

Basing on the above findings, it is revealed that out of all the PE activities that have been put in the curriculum like basic skills in Netball, basic skills in volleyball, leisure and recreation, badminton, Hockey, Rugby, table tennis, to mention but a few, only goalball, blind football, and the guided physical exercises (aerobics) are being taught in this school. Notwithstanding the above, guided physical exercises (aerobics) which includes guided stretching, and jumping are very vital for the learners. These were reported by the participants to enhance physical fitness and coordination. These observations corroborate Ball et al. (2022) research findings that indicated that tailored exercise programs are crucial for optimizing physical outcomes. Learners' feedback indicates that customized plans could further enhance the effectiveness of these exercises. This calls for immediate intervention by the MoES to ensure the PE activities in the guideline are taught to the learners irrespective of the condition/impairment of the learners. This can be through adaptation of the curriculum to cater for the LwVI, provision of adapted resources to be used in the teaching of PE to LwVI, and probably training of teachers in teaching PE to LwVI and training them on the use of available resources.

4.2.5 Summary of Theme 1: PE Activities that learners with visual impairment engage in.

In summary, the findings reveal that LwVI in the selected school engage in a limited range of PE activities, primarily goalball, blind soccer, showdown, and guided aerobics. While these activities are beneficial and valued by both teachers and learners, there is a clear and consistent call for more variety, better adaptations, and more personalized approaches. The current offerings do not fully align with the breadth of the national curriculum, indicating a significant gap in policy implementation. The lack of variety and personalization limits the opportunities for LwVI to develop a diverse range of physical skills and find activities that truly resonate with their individual

interests and abilities. This narrow focus stems from the broader challenges of limited resources and teacher training, which will be explored in subsequent sections.

4.3 The Available Adapted Educational Resources Used for Teaching PE to learners with visual impairment.

This section presents the findings related to the second objective: to examine the available adapted educational resources used for teaching PE to LwVI. The main emerging issues included the availability of specialized PE resources, the accessibility of instructional materials, teacher resource training, the availability of assistive technology, adaptation of traditional resources, integration of sensory resources, and the Effectiveness of resource utilization. The details are presented below.

4.3.1 Specialized PE Equipment

When the participants (n=6) were asked about specialized PE equipment, responses highlighted both the benefits and limitations of the equipment available. It was elaborated that specialized equipment, such as tactile balls and sound-emitting devices, have been useful in facilitating PE activities though they are not adequate and limit a range of activities that can be effectively implemented. One of the participants mentioned:

The tactile balls and sound devices we use in PE are really helpful, but we sometimes lack enough of these resources, which affects our ability to participate in various activities. (LwVI 2)

LwVI 6 said:

“The equipment we have are good, but having more options and enough of each type would make our PE sessions more engaging and effective.”

Similarly, participants (LwVI 8, LwVI 4, LwVI 10) noted that while specialized equipment is valuable, there are instances where the equipment is insufficient or not varied enough. They observed that having more equipment would enhance their PE experience. This implies that while specialized equipment is beneficial, the limited availability can hinder the effectiveness of PE sessions. Findings also show that there is a need for better resource allocation and variety in specialized PE equipment.

When an observation was taken on the specialized PE equipment used to teach LwVI, it was discovered that the school had just a few specialized PE equipment that were available. There were a few balls, which included one for goalball, one blind football, and one cricket ball which they use while playing showdown though the showdown table was the right one. Whereas the study found that specialized equipment, such as tactile balls, sound-emitting devices, and textured materials, play a crucial role in facilitating PE for LwVI, it was revealed that some specialized equipment are not adequate in number as indicated by the learners' feedback which suggests that increasing the availability of such resources could enhance learning experience. These findings are corroborated by Kirk (2023), who emphasizes that specialized equipment helps bridge the sensory gap for visually impaired learners for location accuracy. However, the study also revealed a shortage of some specialized equipment, as indicated by learners' feedback, which suggests that increasing the availability of such resources could enhance the learning experience. This finding is in direct agreement with the study by Palan (2021), who emphasizes the need for equipment

availability as a critical factor for effective teaching of PE to LwVI. The scarcity of equipment is a tangible barrier that directly translates into a narrower range of activities and less engaging lessons for students.

4.3.2 Accessibility of Instructional Materials

When the participants were asked about the accessibility of instructional materials, responses (n=5) highlighted both positive aspects and areas needing improvement. They explained that some of the instructional materials are available but not accessible all the time to LwVI. One participant, T2 reported: *“Instructional materials, such as braille materials and audio guides, are available but not always easily accessible to all learners.”*

While T1 agreed, noting:

“Improving access to these materials could significantly enhance learning outcomes.”

Another participant, LwVI 8 mentioned:

“The braille and audio materials are helpful for understanding the activities, but sometimes they are not readily available, which makes it challenging to follow along.” (LwVI 3)

Similarly, Participants (LwVI 10, LwVI 5) noted that while instructional materials are useful, their accessibility is inconsistent. They observed that having easier access to these materials would improve their ability to participate in PE activities. For instance, LwVI 7 commented:

The instructional materials are useful, but getting them when needed is sometimes difficult. More reliable access would help us engage better.

This emphasizes the need for improved accessibility to instructional materials. The results above indicate that while instructional materials are beneficial, better accessibility is required to support effective learning of PE lessons. The study assessed the use of instructional materials such as adapted lesson plans and audio recordings. T1 observed that adapted lesson plans and audio recordings are useful for delivering instructions effectively. Miyauchi (2020) supports this by highlighting the role of adapted materials in providing tailored educational experiences. However, the research identified gaps in the availability of up-to-date educational materials, as indicated by learners' feedback. Ensuring that instructional materials are regularly updated and aligned with current best practices is crucial for maintaining the effectiveness of PE instruction. The inconsistency in access suggests a systemic issue in resource management, where even when materials exist, logistical or administrative hurdles prevent their consistent use, thereby undermining the learning process.

4.3.3 Teacher Resource Training

When the participants were asked about teacher resource training, responses highlighted the importance of training in effectively utilizing available resources. However, they explained that while some training has been provided, it is insufficient.

Participant T2 said: *“I have personally never been formally trained in teaching LwVI. I just use the knowledge I got from the field of sports Science to teach.”*

T1 added:

“More comprehensive training could improve the use of available resources and enhance PE instruction.”

Another participant stated:

“The training on using resources has been useful, but more in-depth and frequent sessions would help us use these resources more effectively in our teaching.”

This implies that while current training is beneficial, more extensive training could lead to better utilization of resources. Similarly, four participants (LwVI 6, LwVI 9, LwVI 3, LwVI 4) noted that while teachers use resources, there is a need for comprehensive training for teachers to enhance the overall effectiveness of PE sessions. They observed that better-trained teachers could improve their learning experience. For example, LwVI 6 said:

Teachers use the resources, but more training for them would make our PE classes even better.

The results show that the teachers do not have sufficient training both to teach PE and to teach LwVI. This is, therefore, a gap in the teaching of PE to LwVI. This finding resonates with Vygotsky’s sociocultural theory (1978), whose scaffolding aspect advocates for involving a more knowledgeable other to provide structured assistance to help learners bridge the gap between their current level of understanding and their potential development (Eltawab et al., 2023). Without proper training, teachers are not equipped to be the "more knowledgeable other" in the context of adapted PE. Support staff, including specialized PE teachers, orientation and mobility trainers, and teaching assistants, were found to be vital for delivering PE to LwVI. T2 emphasized the importance of having staff trained in working with visually impaired students to provide effective support. This is consistent with Kirk’s (2023) argument that specialized support staff significantly enhance the quality of education for LwVI. Due to the overall ineffectiveness, the study revealed

that there is a need for professional development opportunities for support staff to address emerging needs and challenges.

4.3.4 Availability of Assistive Technology

When the participants were asked about the availability of assistive technology, responses (n=5) highlighted the crucial role of technology in supporting PE activities. They elaborated that the assistive technologies they have are electronic white canes and Perkins Brailers which support them during PE lessons. Participant T2 had this to say: *“Assistive technology, such as electronic aids and navigation devices, have been beneficial but is sometimes limited in availability.”*

T1 noted that though some assistive technology is available, there is a need for a variety of them like the recorders, audible bells, braille readers to mention but a few, to improve the PE experience for LwVI.

Another participant had this to say:

There are electronic white canes which we have here as assistive technology but we don't even use most of the time because we are oriented to move without those canes. We can move to our classes and back without any problem. We can also move to the dining and have our meals without those white canes. (LwVI 7)

Another participant mentioned:

“Assistive technology like navigation aids have been very helpful in PE, but we need more of these tools to support different activities effectively.” (LwVI 1)

This implies that while assistive technology is useful, increasing its availability could further enhance PE activities. This participant said:

Ahh Madam, we have Perkins brailers which we use for making notes. Are they one of the assistive technologies? If they are, we have many of them because almost each of us has a personal one. Me I thought the assistive technologies were only those which use electricity. (LwVI 5)

Similarly, participants (LwVI 4, LwVI 8, LwVI 2, LwVI 10) noted that assistive technology is beneficial but not always readily available. They observed that having more access to such technology could improve their participation in PE. For example, LwVI 4 said:

Assistive technology helps a lot, but having more access to these tools would make our PE sessions more inclusive and effective.

This implies that while assistive technology is useful, increasing its availability could further enhance PE activities. When an onsite observation was taken, the only assistive technologies observed were computers, Perkins Brailers, and one recorder which was even owned by the PE teacher and yet these devices are necessary in the teaching and learning of PE. A Perkins Braille is important because a learner can make PE notes in a theory lesson. Computers and recorders can be used to record a lesson and learners go through during their free time to comprehend it more. This finding is in line with the study by Demchenko et al. (2021), who identify various resources utilized in the teaching of PE as use of tactile diagrams, adaptive equipment, and assistive technology. The learners' uncertainty about what constitutes assistive technology (LwVI 5) also

points to a gap in their own understanding and training on how to use these tools to their full advantage in a PE context.

4.3.5 Adaptation of Traditional Resources

When the participants were asked about the adaptation of traditional resources, responses highlighted the need for modifications to make these resources more suitable for LwVI. One participant said: *“Traditional PE resources, such as standard sports equipment, often require adaptation to be usable.”* (T2)

Another participant mentioned:

“Adapting traditional equipment like balls and cones has been helpful, but we need more creative modifications to make these resources fully effective for our needs.” (T1)

Similarly, participants (LwVI 7, LwVI 10, LwVI 4, LwVI 8) noted that while traditional resources have been adapted, there is room for improvement. They observed that more effective adaptations could enhance their engagement and participation. For instance, LwVI 7 commented: *“The adapted equipment works well, but better modifications could make it even more suitable for our PE activities.”*

The findings above imply that while adaptations are useful, more innovative modifications could be appropriate. This underscores the need for ongoing improvements in adapting traditional resources. This finding is, therefore, consistent with the study by Martiniello et al. (2022), who identified the adapted PE resources as the adapted equipment which include balls with bells, tactile cones, and braille materials which offer accessible formats for written instruction. The call for

"more creative modifications" suggests that the current adaptations are basic and functional but lack the innovation needed to truly maximize the learning experience. This points to a need for more creative problem-solving and resourcefulness from both teachers and students, which could be fostered through targeted training and workshops.

4.3.6 Integration of Sensory Resources

When the participants were asked about the integration of sensory resources, responses (n=6) highlighted their role in enhancing the learning experience. They spelt out some sensory resources like sound cues and textured materials but also called for more variety of sensory resources. For instance, T2 emphasized: *"Integrating sensory resources, such as sound cues and textured materials, is beneficial in making PE more inclusive"*, while T1 emphasized noting: *"There is need for more diverse sensory resources to cater to different learning needs."*

Another participant mentioned: *"The use of sensory resources like sound cues has made PE more engaging, but having more variety of these resources would enhance our learning experience."*
(LwVI 1)

This implies that while sensory resources are valuable, increasing their diversity could further improve the learning experience. Similarly, participants (LwVI 5, LwVI 8, LwVI 2, LwVI 6) noted that sensory resources are useful but could be expanded. They observed that more varied sensory resources would enhance their engagement in PE activities. For instance, LwVI 5 said:

"Sensory resources help a lot, but having many of these tools would make PE even more enjoyable and effective for us."

This highlights the need for a variety of sensory resources. This finding therefore implies that there are limited sensory resources used in the teaching of PE to LwVI. This finding is in disagreement with the study by Haegele et al. (2021), who advocate for the integration of auditory cues and tactile markers for LwVI to engage in PE safely and effectively. It is also spelled out that auditory cues offer guidance and feedback during PE activities, enhancing participation and skill acquisition. The discrepancy between the ideal proposed by Haegele et al. and the reality found in the school highlights a significant implementation gap. The lack of diverse sensory resources means that lessons may not be as engaging or as effective as they could be, failing to cater to the varied learning styles and sensory needs of the LwVI.

4.3.7 Effectiveness of Resource Utilization

When the participants were asked about the effectiveness of resource utilization, responses highlighted both successful practices and areas needing improvement. They pointed out that there is proper use of resources but also called for more improvement in terms of training and integration into the teaching.

Resources are generally used effectively, but there is room for improvement in how they are integrated into PE lessons. There should be some training on the use of these resources. (T1)

T2 agreed, noting: *“More strategic utilization through training could enhance their effectiveness.”*

Another participant mentioned:

“We use the resources we have, fairly well, but better planning and integration into lessons could make them more effective.” (T1)

This implies that while resources are utilized, there is potential for improved integration and effectiveness. Similarly, participants (n=4) noted that while resources are used effectively, more strategic use could improve their impact. They observed that better integration of resources into activities could enhance their PE experience. For example, LwVI 7 said:

The resources are good, but using them more strategically in our lessons could help us get the most out of them. There is need for improved planning and utilization of resources.

This finding indicates that much as the resources are used effectively, there is a need for further training on utilization. This finding is therefore in line with Cain et al. (2023), who emphasizes teacher training for effective instruction and support for LwVI. The feedback suggests that while teachers are doing their best with what they have, a lack of pedagogical training in how to *strategically* integrate these resources into a coherent lesson plan is a limiting factor. It's not just about having the resources, but knowing *how* and *when* to use them for maximum impact, which is a skill that needs to be developed.

4.3.8 Summary of Theme 2: Adapted Resources

In summary, the findings on adapted resources reveal a picture of scarcity, inconsistency, and underutilization. While specialized equipment, instructional materials, and assistive technology exist and are valued, their availability is limited, and their accessibility is inconsistent. A critical underpinning issue is the profound lack of teacher training, which affects everything from the adaptation of traditional resources to the strategic and effective utilization of what is available. The learners are aware of these gaps and clearly articulate the need for more resources, better access, and more skilled teachers. This theme is inextricably linked to the challenges, as the lack of

resources is a primary challenge in itself. The findings suggest that without significant investment in resources and, crucially, in the training of teachers to use them, the goal of providing a truly inclusive and effective PE program for LwVI will remain out of reach.

4.4 The Suitability of the PE Teaching Environment for LwVI

This section presents the findings related to the third objective: to ascertain the suitability of the PE teaching environment for LwVI. The main emerging issues included the safety of the teaching environment, accessibility of facilities, adequacy of space, clarity of spatial orientation, adaptation of the physical layout, sensory stimulation in the environment, presence of assistive features, and condition of the resources. The details are presented below.

4.4.1 Safety of the Teaching Environment

When the participants were asked about safety of the teaching environment, responses (n=6) highlighted both positive aspects and areas needing improvement. They explained that much as the measures are in place, they experience some hazards that need to be attended to for a better learning environment. Participant T1 had this to say:

Safety measures are generally in place but there are occasional hazards that need addressing. As teachers, we try so much to ensure safety of our learners by clearing the bushes around the field, filling potholes, removing stones, leveling the PE learning area because we are the immediate custodians of their lives given their type of disability. We are their eyes and for that matter, we ensure security in whatever they do including during lessons.

Participant T2 noted:

While some safety measures are effective, more attention is needed to ensure a consistently safe environment which includes modifications like building of permanent ramps for easy movement during the teaching and learning process.

Another participant mentioned: “*While there are safety measures in place, there are times when the environment can still be risky, especially if we don’t regularly check for potential hazards like stones.*” LwVI 4)

This implies that maintaining and improving safety measures is crucial for creating a secure teaching environment. Similarly, Participants (LwVI 5, LwVI 2, LwVI 7) noted that safety is a concern in some areas. They observed that regular inspections and maintenance could enhance safety. For instance, LwVI 5 said:

Safety is good most of the time, but we sometimes encounter issues that need to be addressed to ensure everyone is safe during PE activities. There is therefore need for regular clearance of the play area, filling of potholes among others.

This highlights the need for continuous attention to safety in the teaching environment. When an observation was taken, there was a playground for PE activities but there were some potholes that were not filled and this puts LwVI at risk. Safety is a critical consideration in the PE teaching environment. The findings revealed that while general safety protocols are followed, there are occasional gaps in addressing specific risks associated with visual impairment. For example, the absence of distinct auditory signals or tactile markers for hazard identification was identified as a concern. This finding aligns with the work of Harrison (2021), who emphasizes the importance of

tailored safety measures to address the unique needs of LwVI. The study recommends implementing additional safety features, such as sound-emitting beacons and tactile warning signs, to enhance risk management and ensure a safer learning environment. The reliance on teachers to be the "eyes" of the students, while commendable, is not a sustainable or systemic solution and points to a failure in the environmental design itself.

4.4.2 Accessibility of Facilities

When the participants were asked about the accessibility of facilities (n=7), responses highlighted both strengths and weaknesses in the current setup. Acknowledged accessibility of some facilities but also called for more adaptations for better navigation. T2 reported that:

“While some facilities are accessible, others present challenges for learners with visual impairment.”

Participant T1 noted, emphasizing the need for more consistent accessibility across all facilities. Another participant mentioned:

Some facilities are accessible for example the classrooms because there are ramps, but there are still areas that are difficult to navigate, which affects how well we can participate in PE. (LwVI 5)

This implies that improving accessibility is essential for enhancing participation in PE activities. This participant commented:

“We can get around some parts of the facility, for example the classrooms but others are hard to navigate. Better accessibility would help us participate more fully.” (LwVI 3)

Similarly, Participants (LwVI 7, LwVI 10, LwVI 4) noted that while some facilities are accessible, others are not as user-friendly. They observed that better accessibility features could improve their experience. This underscores the need for improved accessibility in all facilities. This finding is against the finding by Cook & Polgar (2008), who emphasize the need to have well-lit classrooms and compound, ramps and walkways for accessing learning facilities. The partial accessibility (e.g., ramps to classrooms but not to the PE field) creates a fragmented experience where learners may be able to access parts of the school but are excluded from others. This sends a mixed message about inclusion and highlights a lack of a whole-school approach to accessibility.

4.4.3 Adequacy of Space

When the participants were asked about the adequacy of space in the PE environment, it was revealed that the space is adequate but only needs modifications. The findings show there is adequate space in classrooms, the field/playground except in some few areas and gave an example of where they play showdown from. One of the participants mentioned:

“The space is usually sufficient, but there are times learners run into issues with cramped areas which makes some activities difficult.” (T1)

Another participant T2 stated:

“Space is adequate in many cases, there are specific locations that could benefit from expansion. An example is the showdown area.”

Similarly, participants (LwVI 6, LwVI 1, LwVI 8) noted that while there is enough space for most activities, some areas are too small. They observed that expanding these areas could enhance their participation. For instance, LwVI 6 said:

Most of the space is fine, but there are some areas that feel too small for the activities we do. For example, where we play showdown from. The place is enclosed and the space where the players stand is not adequate enough for perfect participation. More space would be better.

This highlights the need for considering space adjustments in certain areas. This implies that while space is generally adequate, adjustments may be needed in areas to improve functionality. The study assessed the physical space and layout of the PE teaching environment to determine its suitability for LwVI. T1 highlighted that the space is generally adequate but often lacks specific modifications to enhance accessibility. The layout of the gymnasium and sports fields was noted to be somewhat challenging for visually impaired learners due to obstacles and lack of clear tactile or auditory cues. This is contrary to research by Adams et al. (2022) that underscores a well-organized and obstacle-free space being crucial for ensuring the safety and mobility of LwVI. The study suggests that modifications such as clearly marked pathways and accessible storage areas could improve the overall suitability of the space. The issue of the showdown area being too small is a perfect example of how a space can be technically "adequate" in size but functionally inadequate due to poor design or lack of consideration for the specific needs of the activity and the users.

4.4.4 Clarity of Spatial Orientation

the participants were asked about the clarity of spatial orientation in the PE environment, responses (n=3) highlighted that orientation aids are used but not consistent. Participant T2 reported:

“Spatial orientation aids, such as tactile markers, are used but are not always clear or consistent.”

Participant T1 agreed and said:

“Improving these aids could help learners navigate the environment more effectively.”

Another participant mentioned that:

“The orientation aids we use are helpful, but sometimes they are not clear enough, which can make it difficult to find our way.” (Participant LwVI 4)

This implies that better clarity in spatial orientation aids is needed to support effective navigation. Similarly, participants (LwVI 5, LwVI 9, LwVI 3, LwVI 10) noted that while orientation aids are provided, they are not always clear. They observed that clearer aids would improve their ability to navigate. For example, participant LwVI 5 commented:

“The orientation aids are useful, but they could be clearer. Sometimes it’s hard to know where things are located.”

This highlights the need for improved clarity in spatial orientation aids. The inconsistent and unclear nature of these aids means they cannot be relied upon, forcing learners to depend on memory or assistance from others, which undermines their independence and confidence. This is a clear failure in environmental design to provide the necessary scaffolding for independent

navigation, a key aspect of the sociocultural theory where the environment should support the learner's development.

4.4.5 Adaptation of the Physical Layout

When the participants (n=6) were asked about the adaptation of the physical layout, responses highlighted both the positive and negative part by saying that the physical adaptations are somewhat made generally but also indicated the need for adjustments to accommodate LwVI.

Participant T1 said:

“Some modifications like ramps have been made but there are still areas that require further adaptation.”

While T2 stated: *“More comprehensive adjustments could enhance the PE environment.”*

Another participant mentioned:

We have made some changes to the layout for example clearing the playground to help with navigation, but there are still areas that need more work to be fully accessible. (T1)

This implies that while adaptations are in place, further modifications are necessary. Similarly, Participants (LwVI 6, LwVI 10, LwVI 2, LwVI 4) noted that while some adaptations have been made, more comprehensive changes are needed. They observed that better adaptations would improve their experience. For instance, LwVI 6 said:

The layout is somehow adapted, but more changes could make it even easier to get around and participate in PE.

This underscores the need for continued adaptation of the physical layout. When an observation was taken, there were some ramps to the classrooms and other offices, but there was no other adaptations seen in the school environment apart from the planted flowers which some participants claimed they give them direction. This finding therefore implies that the adaptation of the physical layout is poor basing on the responses by the participants and yet for the PE to be successful, there is need for proper adaptation of the physical layout such that the LwVI can easily access the facilities. This finding is therefore in disagreement with the study by Alhumaid et al. (2021), who spotted out equipment adaptability and accessibility features like ramps and tactile pathways to enhance mobility and navigation for LwVI during the teaching and learning of PE. The reliance on planted flowers for navigation is an example of informal, user-generated coping mechanisms that arise when formal adaptations are lacking. While resourceful, it is not a reliable or comprehensive solution.

4.4.6 Sensory Stimulation in the Environment

When the participants were asked about sensory stimulation in the PE environment, responses (n=6) highlighted both effective and limited sensory features. They identified sensory stimulation used as sound cues which include verbal instructions, texture sensory stimulation features but also said the sensory stimulation resources are limited. One of the participants mentioned:

We use sound and texture for sensory stimulation, this includes the verbal instructions by the teacher but having a variety of sensory features would make the environment more engaging. (T2)

This implies that while sensory stimulation is used, increasing its diversity could further enhance the environment. Similarly, Participants (LwVI 1, LwVI 4, LwVI 7, LwVI 8) noted that sensory stimulation is helpful but could be improved. They observed that more varied sensory features would enhance their participation. For example, LwVI 1 commented:

“Sensory features like sounds and textures are good, but having more options would make the environment even better for us.”

This highlights the need for expanded sensory stimulation. The above finding reveals there are limited sensory stimulations in the environment to enhance the effective teaching of PE to LwVI. This finding is against the study by Miyauchi (2020), who investigated the availability of educational resources for teaching PE to LwVI. The study pointed out the utilization of tactile equipment, auditory cues, and markers that provide tactile feedback and promote sensory awareness for LwVI. The lack of diverse sensory stimulation makes the environment less rich and engaging for LwVI, who rely on other senses to compensate for their lack of vision. A monotonous or under-stimulating environment can lead to decreased motivation and engagement.

4.4.7 Presence of Assistive Features

When the participants were asked about the presence of assistive features in the PE environment, (n=4) responses highlighted that LwVI use some assistive features like, ramps, walkways, planted flowers, classroom walls. Participant T1 reported:

“While some assistive features are available like ramps, there is need for more.”

Participant T2 agreed and stated that: *“Additional features could improve the learning experience.”*

Another participant said: *“We have some assistive features like walkways but adding more of the features could help us navigate and participate more effectively.” (T1)*

Another participant had this to say:

There are some flowers planted in our compound that help us navigate. When you reach the flowers and feel them, it gives you the direction you are to take.

For example, when you are going to the field for a PE practical lesson.

Similarly, four participants (LwVI 6, LwVI 5, LwVI 3, and LwVI 10) noted that while assistive features are present, more would be helpful. They observed that additional features could improve their engagement. For instance, LwVI 6 said:

The assistive features for example our classroom walls are useful, but more of the features would make our PE classes better and more accessible.

The findings above imply that increasing the presence of assistive features would be beneficial. The findings therefore, highlight the need for expanding assistive features. Assistive features within the PE environment were examined to determine their effectiveness. T1 observed that while some modifications are in place, such as tactile floor markings and audio cues, these are not consistently applied or well-integrated into the overall teaching environment. This is supported by Jones and Williams (2020), who found that consistent and comprehensive accessibility features

are essential for creating an inclusive environment. The study highlights the need for a more systematic approach to integrating accessibility features throughout the PE facilities to ensure that all areas are navigable and usable by LwVI. The ad-hoc nature of the current features (ramps here, flowers there) is indicative of a lack of a master plan for accessibility.

4.4.8 Condition of the Resources

When the participants were asked about the conditions of the resources, responses (n=6) showed that some resources were in good condition while some were in bad condition. Participant T1 had this to say:

The truth is most of our PE resources are not in good condition though we have some that can work. For example, most of our balls are deflated and the recorders spoilt.

Another participant said:

Huh, when you ask about the condition of the resources, I don't know what I can answer you but sincerely speaking, most of the PE resources are of long ago. There are few which are current but the resources like those adapted balls you see; they are very old. You can even see they have no pressure. (T2)

Similarly, Participants (LwVI 2, LwVI 4, LwVI 5, LwVI 6) noted that there are few that work and they keep on getting spoilt. The findings from the observation confirmed the information given by the participants. Some balls were deflated while others were good. The recorders were spoilt while only one was active and owned by a teacher. It was also revealed that the showdown table was in

good condition but the original ball to be used was spoilt and discarded. The players could therefore use the ball for a cricket game to play showdown. The poor condition of the resources is a damning indictment of the lack of investment and maintenance. It is not just about having resources, but having resources that are *functional* and *safe*. Deflated balls and spoilt equipment are not just ineffective; they can be dangerous and demotivating for students. This reflects a systemic undervaluing of PE for LwVI.

4.4.9 Challenges Faced in Teaching PE to LwVI

When the participants were asked about the challenges they encounter in the teaching/learning of PE, several issues emerged including lack of training, limited equipment, and failure to follow visual demonstrations. These challenges are not isolated but rather form a web of issues that collectively hinder the effective teaching and learning of PE to LwVI.

Inadequate Teacher Training and Expertise

A dominant and foundational challenge that emerged from the data is the profound lack of specialized training for PE teachers in teaching LwVI. Participants (n=2), both teachers themselves, openly admitted to this gap. T2 stated:

I personally have a challenge of teaching LwVI because I have little knowledge in dealing with such learners and this is because I haven't had any formal training in teaching LwVI.

T1 corroborated this, adding another layer to the problem:

The most disturbing challenge I see with PE is that, it has been made compulsory by the Ministry of Education and Sports but the curriculum is general and it does not cater for learners with special needs and in this case, those with visual impairment.

This lack of pre-service and in-service training means teachers are forced to rely on trial-and-error, goodwill, and their general PE knowledge, which is not sufficient to meet the specific needs of LwVI. This finding is consistent with the study by Cain et al. (2023), who identified limited teacher training as a significant barrier to inclusion. From the perspective of Vygotsky's sociocultural theory, this is a critical failure of the system to provide the "more knowledgeable other." Without a teacher who is equipped with the specific pedagogical skills to scaffold learning for LwVI, the students are left in a state of perpetual dependence within their Zone of Proximal Development, unable to bridge the gap to higher-level skills. This lack of expertise is the root cause from which many other challenges, such as the inability to adapt activities or use resources effectively, stem.

Difficulties in Following Visual Demonstrations

Directly linked to the lack of teacher training is the challenge that LwVI face in following visual demonstrations, which are a cornerstone of traditional PE instruction. This issue was raised by multiple learners (n=5). LwVI 7 poignantly described the problem:

Ahaaa, the challenges are many, first of all PE is enjoyable when you are seeing what the teacher is demonstrating but for us who are blind, it is very difficult. For us we just follow the verbal instructions of which you might not be doing it perfectly like the teacher is demonstrating.

LwVI 3 shared a similar frustration:

My challenge is when the teacher is explaining how certain activities are to be performed and I have no opportunity to see exactly how it is demonstrated. I don't feel I am doing it the way he wants.

Other participants (LwVI 1, LwVI 4, LwVI 5) had similar arguments, emphasizing the difficulty of imitating actions they cannot see. This is a classic example of a pedagogical mismatch. The teacher, trained for sighted students, uses a primary teaching method (visual demonstration) that is inaccessible to their LwVI students. This is a direct contradiction to the principles of scaffolding in sociocultural theory, where the support provided should be appropriate to the learner's needs. A visual demonstration is not appropriate support for a learner with visual impairment. This challenge highlights the urgent need for teachers to be trained in alternative teaching methods, such as physical guidance (hand-over-hand), tactile modeling, and detailed verbal descriptions, to ensure that LwVI can access the instruction.

Severe Limitation of Equipment and Resources

The challenge of limited and inadequate equipment was a recurring theme, mentioned by both teachers and learners (n=4). LwVI 3 concisely stated:

“The biggest challenge we have is the limited resources to use during the teaching/learning of PE”

T1 elaborated on this, linking it directly to the range of activities offered:

“We would be teaching so many activities in this school but the problem are the resources. We only now teach a few that are available.”

This scarcity means that even if teachers were trained and willing, their hands are tied by the lack of necessary tools. As detailed in the findings on resources, the school has a handful of worn-out balls and very little specialized equipment. This finding is in line with Cain et al. (2023), who identified a lack of specialized equipment as a major barrier. The impact of this challenge is multifaceted: it limits the variety of activities, reduces student engagement, and increases safety risks (e.g., using a cricket ball for showdown), and undermines the quality of the PE program. It is a tangible, physical manifestation of the low priority given to PE for LwVI by the authorities responsible for funding and resourcing schools.

4.4.10 Summary of Theme 3: Suitability of the Environment

In summary, the findings on the suitability of the PE environment paint a picture of a space that is partially accessible but fraught with inconsistencies, hazards, and a lack of specialized design. While some commendable efforts are made by teachers to ensure safety, the physical environment itself is not adequately designed for the needs of LwVI. Key issues include inconsistent accessibility, inadequate safety features, poor spatial orientation cues, and a general lack of sensory stimulation and assistive features. The poor condition of existing resources further compounds the problem. The environment, as it stands, is not a true enabler of participation but rather a series of obstacles that require constant negotiation and adaptation. This falls far short of the standards advocated for in the literature and fails to provide the supportive, scaffolded environment necessary for LwVI to thrive, as suggested by sociocultural theory.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary, conclusions, and recommendations obtained from the study regarding the teaching of physical education (PE) to Learners with Visual Impairment (LwVI), as detailed in Chapter Four. The purpose of this study was to investigate the teaching of PE to LwVI in a special secondary school in Soroti City, Eastern Uganda. This chapter is structured to first provide a summary of the key findings according to the three research objectives, followed by the conclusions drawn from these findings, and finally, a set of actionable recommendations for various stakeholders.

5.1 Summary of Findings

The findings are summarized based on the three research objectives that guided the study.

5.1.1 Summary of Findings on PE Activities That LwVI Engage In

The study revealed that the PE activities that LwVI engage in are categorized into adapted ball games, tactile games, modified team sports, and guided physical activities. While some PE activities, such as goalball and blind soccer, are effectively tailored to the needs of visually impaired learners, others lacked adequate modifications, which affects their participation and the effectiveness of PE teaching. It was also revealed that the activities being taught are very few compared to what the PE curriculum expects schools to teach. Out of the various activities in the PE syllabus, which include badminton, volleyball, and netball, among others, only goalball, blind football, aerobics, and showdown are taught in this secondary school.

5.1.2 Summary of Findings on the Available Adapted Resources Used for Teaching PE to LwVI

The findings indicated that the availability and use of resources for teaching PE to LwVI were found to be severely limited. While some specialized resources, such as tactile and auditory tools, are used, their integration into the PE curriculum is inconsistent. It was also revealed that these educational resources are not adequately adapted to meet the specific needs of LwVI during the teaching of PE. The condition of the available resources is also poor, with many being worn out or broken, which further hinders effective teaching and learning.

5.1.3 Summary of Findings on the Suitability of the PE Teaching Environment for LwVI

To ascertain the suitability of the PE teaching environment, findings revealed several strengths and weaknesses. The physical space is generally adequate but lacks specific modifications such as landmarks, enough ramps, and rails, among others, for improved accessibility. Safety is a concern due to unfilled potholes and uneven terrain. Furthermore, there is a lack of clear tactile or auditory cues for spatial orientation, and the overall sensory stimulation within the environment is limited, making it less engaging for LwVI.

5.2 Conclusions

Based on the findings from the study, the following conclusions were drawn:

The study sought to establish the PE activities that LwVI engage in. It was identified that LwVI engage in a limited range of PE activities, including adapted sports like goalball and blind football, and guided exercises like aerobics. While these activities are beneficial, they are not sufficient to

cover the breadth of the national curriculum. It is, therefore, concluded that the PE program in the school is narrow and lacks variety, primarily due to resource constraints and lack of teacher expertise in adapting a wider range of activities, thereby failing to provide a comprehensive physical education experience for LwVI.

The study was also intended to examine the available adapted educational resources for teaching PE to LwVI. Subsequently, the resources were found to be critically insufficient, poorly maintained, and inconsistently integrated into the curriculum. The study, therefore, concludes that there is a significant resource gap that directly impedes the delivery of quality PE. The lack of essential adapted equipment and materials means that teachers cannot effectively implement even the limited activities they are familiar with, severely compromising the learning experience for LwVI.

Finally, the study aimed at ascertaining the suitability of the PE teaching environment, findings revealed a space that is physically present but functionally inadequate. It is, therefore, concluded that the teaching environment, while generally adequate in size, is not suitably adapted for LwVI. The absence of critical accessibility features, safety measures, and sensory aids creates an environment that is not fully inclusive or safe, posing significant barriers to the independent mobility and full participation of LwVI in PE activities.

5.3 Recommendations of the Study

Based on the conclusions, the study makes the following specific, measurable, achievable, relevant, and time-bound (SMART) recommendations for the various stakeholders responsible for addressing the identified gaps.

To the Ministry of Education and Sports (MoES) and the National Curriculum Development Centre (NCDC):

1. **Develop and Disseminate an Adapted PE Curriculum Supplement:** The NCDC should, within the next 12 months, develop and disseminate a supplementary curriculum guide specifically for teaching PE to LwVI. This guide should provide detailed adaptations for all activities in the mainstream syllabus, ensuring teachers have a clear, practical resource to facilitate inclusion.
2. **Mandate and Fund Specialized Teacher Training:** The MoES, in collaboration with Kyambogo University's Faculty of Special Needs and Rehabilitation, should design and implement a mandatory, 40-hour in-service training module on adapted PE for all teachers in special schools. This training should be rolled out nationally before the start of the 2026 academic year, with a budget allocated for its implementation and annual refreshers.
3. **Allocate a Dedicated PE Resources Grant:** The MoES should introduce a specific annual capitation grant for every special school with LwVI, specifically for the procurement and maintenance of adapted PE equipment. This grant should be sufficient to ensure each school has at least a full set of goalball equipment, beep balls, tactile markers, and audio recorders by the end of the 2025/2026 financial year.

To School Administrators and Management:

4. **Conduct an Annual Environmental Audit:** The headteacher of the special school should conduct a comprehensive accessibility and safety audit of the PE environment at the beginning of each academic year. Based on the audit findings, a plan of action, with a clear

budget and timeline, should be developed to address identified hazards, such as filling potholes and installing tactile pathways, within the first term of the school year.

5. Establish a Resource Maintenance Schedule: The school administration should create and display a clear schedule for the regular inspection and maintenance of all PE equipment. This schedule should designate a staff member responsible for ensuring equipment is safe, functional, and stored properly, thereby extending the lifespan of the limited resources available.

To PE Teachers and Support Staff:

6. Form a Peer Learning and Support Group: PE teachers in the region should establish a professional learning community focused on adapted PE. This group should meet at least once per term to share best practices, troubleshoot challenges, and co-develop adapted lesson plans, thereby fostering peer-to-peer capacity building and reducing professional isolation.

To Civil Society Organizations and Development Partners:

7. Partner in Resource Mobilization and Provision: NGOs and development partners working in disability and education should partner with the school to mobilize resources and provide specialized equipment and assistive technology that may not be covered by government funding. This could include organizing fundraising drives for a sensory garden or donating advanced assistive devices, thereby supplementing the school's efforts to create a richer learning environment.

5.4 Areas for Further Research

Given the scope and limitations of this study, the following areas are suggested for further research:

1. A longitudinal study could be conducted to evaluate the long-term impact of the recommended interventions (such as specialized teacher training and increased resource provision) on the physical skills, social integration, and overall well-being of LwVI.
2. Further research should focus on evaluating the comparative effectiveness of different types of assistive technology and specialized equipment in enhancing the participation and skill acquisition of LwVI in various PE activities.
3. A study could be conducted to explore the lived experiences and perceptions of parents of LwVI regarding the PE program, to gain a more holistic understanding of the factors that influence student participation and to identify areas for home-school collaboration.

REFERENCES

- Achieng, C. (2022). *Exploring education support services and systems to promote disability inclusion in one selected public university in Uganda* (Doctoral dissertation, Kyambogo University [unpublished work]).
- Active Living Research. (2011). *School Policies on Physical Education and Physical Activity*. October. www.activelivingresearch.org
- activity—a systematic review of longitudinal studies. BMC public health, 13, 1-9.*
- Alhumaid, M. M., Khoo, S., & Bastos, T. (2021). The effect of an adapted physical activity intervention program on pre-service physical education teachers' self-Efficacy towards inclusion in Saudi Arabia. *Sustainability, 13*(6), 3459.
- Alshenqeeti, H. (2014). Interviewing as a Data Collection Method: A critical Review. *English Linguistics Research, 3*(1), 39-45. <https://doi.org/10.5430/elr.v3n1p3>
- Alves M.L.T., Duarte E. (2011). History of inclusionary process of student with disability in the school: A reflexion of historically developed rights. *Revista Educação Especial, 24*(40), 207–218.
- Al-Zboon, E. (2020). Perceptions of assistive technology by teachers of students with visual impairments in Jordan. *Journal of Visual Impairment & Blindness, 114*(6), 488-501.
- Araim, M., Campbell, M. J., Cooper, C. L., & Lancaster, G. A. (2010). *What is a pilot or feasibility study? A review of current practice and editorial policy. BMC medical research methodology, 10*(1), 1-7

- Ball, L., Lieberman, L., Haibach-Beach, P., Perreault, M., & Tirone, K. (2022). Bullying in physical education of children and youth with visual impairments: A systematic review. *British Journal of Visual Impairment*, 40(3), 513-529.
- Battistin, T., Mercuriali, E., Zanardo, V., Gregori, D., Lorenzoni, G., Nasato, L., & Reffo, M. E. (2021). Distance support and online intervention to blind and visually impaired children during the pandemic COVID-19. *Research in Developmental Disabilities*, 108, 103816.
- Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). How people learn (Vol. 11). Washington, DC: National academy press.
- Brian, A., Bostick, L., Starrett, A., Klavina, A., Miedema, S. T., Pennell, A., ... & Lieberman, L. J. (2020). The effects of ecologically valid intervention strategies on the locomotor skills of children with visual impairments. *Adapted Physical Activity Quarterly*, 37(2), 177-192.
- Cain, M., Fanshawe, M., Armstrong, E., & Lieberman, L. (2023). Barriers to Physical Activity for Australian Students with Vision Impairment. *International Journal of Disability, Development and Education*, 1-19.
- Choi, K. Y., Wong, H. Y., Cheung, H. N., Tseng, J. K., Chen, C. C., Wu, C. L., ... & Cheong, A. M. Y. (2022). Impact of visual impairment on balance and visual processing functions in students with special educational needs. *Plos one*, 17(4), e0249052.
- Demchenko, I., Maksymchuk, B., Bilan, V., Maksymchuk, I., & Kalynovska, I. (2021). Training future physical education teachers for professional activities under the conditions of inclusive education. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 12(3), 191-213.

- Demmin, D. L., & Silverstein, S. M. (2020). Visual impairment and mental health: unmet needs and treatment options. *Clinical Ophthalmology*, 4229-4251.
- Devile, E., & Kastenholz, E. (2020). Accessible tourism experiences: the voice of people with visual disabilities. In *Social Tourism at the Crossroads* (pp. 84-104). Routledge.
- El Sewerky, J. M., Mahmoud, S. H., & Abdel-Tawab, E. M. (2023). The effectiveness of using educational scaffolding on learning the skill of the chest pass for the preparatory stage. *International Journal of Sports Science & Arts-English*, 23(1).
- Eltawab, A., Mahmoud, E., El Swirki, J. M., & Hosny, S. M. (2023). *The effectiveness of using educational scaffolding on learning the skill of the chest pass for the preparatory stage. International Journal of Sports Science and Arts*, 23(1), 50-69.
- Ginis, K. A. M., van der Ploeg, H. P., Foster, C., Lai, B., McBride, C. B., Ng, K., ... & Heath, G. W. (2021). Participation of people living with disabilities in physical activity: a global perspective. *The Lancet*, 398 (10298), 443-455.
- Haegele J. A., Sutherland S. (2015). Perspectives of students with disabilities toward physical education: A qualitative inquiry review. *Quest*, 67, 255–273.
- Haegele, J. A., Kirk, T. N., Holland, S. K., & Zhu, X. (2021). ‘The rest of the time I would just stand there and look stupid’: Access in integrated physical education among adults with visual impairments. *Sport, Education and Society*, 26(8), 862-874.
- Haegele, J. A., Salerno, M., Nowland, L. A., Zhu, X., Keene, M. A., & Ball, L. E. (2023). Why modify? Visually impaired students’ views on activity modifications in physical education. *European Physical Education Review*, 1356336X231162603.

- Haegele, J. A., Zhu, X., & Holland, K. (2020). Fitness testing experiences in integrated physical education as reflected by adults with visual impairments. *European Physical Education Review*, 26(4), 747-763.
- Heale, R., & Twycross, A. (2018). What is a case study? *Evidence-based nursing*, 21(1), 7-8.
- Hurst, A. (2023). Participant observation. *Introduction to Qualitative Research Methods*.
- Kirk, T. N., Haegele, J. A., & Zhu, X. (2023). Physical Education Skill Development of Individuals With Visual Impairments: A Preliminary Study. *Physical Educator*, 80(3), 278-294.
- Kiru, E. W. (2019). Special education in Kenya. *Intervention in School and Clinic*, 54(3), 181-188
- Kouzes, J. M., & Posner, B. Z. (2011). *Credibility: How leaders gain and lose it, why people demand it*. John Wiley & Sons.
- Kretchmar, R. S., Dyreson, M., Llewellyn, M. P., & Gleaves, J. (2023). *History and philosophy of sport and physical activity*. Human Kinetics.
- Lakens, D. (2022). Sample size justification. *Collabra: Psychology*, 8(1), 33267.
- Li, Q. D., Kuang, X. M., & Qi, J. (2020). Correlates of physical activity of children and adolescents with visual impairments: A systematic review. *Current Pharmaceutical Design*, 26(39), 5002-5011.
- Lindquist, E. F. (1940). Sampling in educational research. *Journal of Educational Psychology*, 31(8), 561–574. <https://doi.org/10.1037/h0058806>
- Lynch, P., Singhal, N., & Francis, G. A. (2021). EdTech for learners with disabilities in primary school settings in LMICs: A systematic literature review.

- Macbeth, J. (2020). Visually impaired sport. In *Movement and Visual Impairment* (pp. 78-96). Routledge.
- Martiniello, N., Eisenbarth, W., Lehane, C., Johnson, A., & Wittich, W. (2022). Exploring the use of smartphones and tablets among people with visual impairments: Are mainstream devices replacing the use of traditional visual aids? *Assistive Technology*, 34(1), 34-45.
- Miller, Ronald. Vygotsky in perspective. Cambridge university press, 2011.
- Miyauchi, H. (2020). A systematic review on inclusive education of students with visual impairment. *Education sciences*, 10(11), 346.
- Morgan, H. (2022). Conducting a Qualitative Document Analysis. *Qualitative Report*, 27(1), 64–77. <https://doi.org/10.46743/2160-3715/2022.5044>
- Morgan, S. J., Pullon, S. R., Macdonald, L. M., McKinlay, E. M., & Gray, B. V. (2017). Case study observational research: A framework for conducting case study research where observation data are the focus. *Qualitative health research*, 27(7), 1060-1068.
- Morley, D., Banks, T., Haslingden, C., Kirk, B., Parkinson, S., Van Rossum, T., ... & Maher, A. (2021). Including pupils with special educational needs and/or disabilities in mainstream secondary physical education: A revisit study. *European Physical Education Review*, 27(2), 401-418.
- Mosston, M., & Ashworth, S. (2008). *Teaching Physical Education: First on-line edition*. Copyright 2012 *Spectrum of Teaching Styles*, 32.
<http://www.spectrumofteachingstyles.org/>

- Nyquist, A., Jahnsen, R. B., Moser, T., & Ullenhag, A. (2020). The coolest I know—a qualitative study exploring the participation experiences of children with disabilities in an adapted physical activities program. *Disability and Rehabilitation*, 42(17), 2501-2509.
- Palan, R. (2021). “I seriously wanted to opt for science, but they said no”: visual impairment and higher education in India. *Disability & Society*, 36(2), 202-225.
- Pandey, P., & Pandey, M. M. (2021). Research methodology tools and techniques. Bridge Center.
- Pellerin, S., Wilson, W. J., & Haegele, J. A. (2022). The experiences of students with disabilities in self-contained physical education. *Sport, Education and Society*, 27(1), 14-26.
- Reiner, M., Niermann, C., Jekauc, D., & Woll, A. (2013). *Long-term health benefits of physical*
- Shimon, J. M. (2019). Introduction to teaching physical education: Principles and strategies. Human Kinetics, Incorporated.
- Sikoyo, L., Ezati, B. A., Nampijja, D., Asiimwe, J. A., Walimbwa, M., & Okot, D. (2023). Staff capacities for inclusive teaching and learning of students with visual impairment: a case of public universities in Uganda. *East African Journal of Education Studies*, 6(3), 174-191.
- Södergren, J. (2021). Brand authenticity: 25 Years of research. *International Journal of Consumer Studies*, 45(4), 645-663.
- Sweeting, J., Merom, D., Astuti, P. A. S., Antoun, M., Edwards, K., & Ding, D. (2020). Physical activity interventions for adults who are visually impaired: A systematic review and meta-analysis. *BMJ open*, 10(2).

Tusiime, O., & Odiango, R. (2022). Evaluation of the challenges of inclusion among students with disabilities in university sports: the case of Makerere University, Uganda. *European Journal of Physical Education and Sport Science*, 9(1).

van Nispen, R. M., Virgili, G., Hoeben, M., Langelaan, M., Klevering, J., Keunen, J. E., & van Rens, G. H. (2020). Low vision rehabilitation for better quality of life in visually impaired adults. *Cochrane Database of Systematic Reviews*, (1).

APPENDICES

Appendix I: Introductory Letter from the University

KYAMBOGO UNIVERSITY

P. O. BOX 1 KYAMBOGO

Tel: 041 - 4286792 Fax: 256-41-220464

Website: www.kyu.ac.ug Email: drgt@kyu.ac.ug

Directorate of Research and Graduate Training

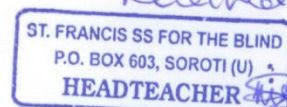
Office of the Director

Date: 17 /05/2024

TO WHOM IT MAY CONCERN

RE: NANDUTU IRENE EUNICE

Dear Sir/Madam,



This is to introduce to you the above-named student Reg: No **22/U/GMSN/532/PE** pursuing Master of Special Needs Education, Kyambogo University.

She intends to carry out research on **"Teaching Physical Education to Learners with Visual Impairment: A case of a Special Secondary School in Soroti City, Eastern Uganda."** in partial fulfillment of the requirements for the award of Master of Special Needs Education of Kyambogo University.

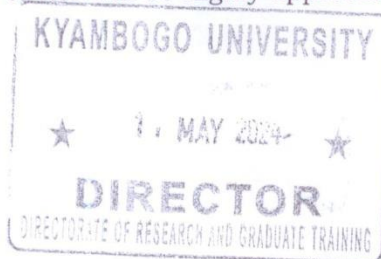
The purpose of this letter therefore is to request you to grant her permission to carry out her study in your institution.

Any assistance rendered to her will be highly appreciated.

Yours sincerely



Prof. Bosco Bua
AG. DIRECTOR



Appendix II: Interview Guide for the Teachers

My name is Nandutu Irene Eunice, a student of Masters in Special Needs Education of Kyambogo

University carrying out a study on “Teaching physical education to LwVI: A

case of a special secondary school in Soroti City, Eastern Uganda. You are identified as a potential

participant for this study. You are therefore requested to participate by responding to the following

questions. This study is purely for academic purposes only and the information obtained from you will

be treated with confidentiality.

Bio Data:

1. Name:
2. Age:
3. Gender:
4. Years of Teaching Experience:
5. Years of Experience Teaching PE to LwVI:

Interview Questions:

Objective (i): To establish the PE activities that LwVI engage in.

1. Can you describe the types of PE activities that are currently offered to LwVI at this school?
2. How do you adapt traditional PE activities to make them accessible for LwVI?
3. What specific challenges do you encounter when implementing these activities?
4. Are there any activities that you believe are particularly effective or ineffective for these learners? Please explain why.

Objective (ii): To examine the available educational resources used for teaching PE to LwVI.

1. What types of educational resources (e.g., tactile tools, auditory aids) are currently used in teaching PE to LwVI?
2. How do you assess the adequacy of these resources in meeting the needs of your students?
3. Can you give examples of how these resources are integrated into your PE lessons?
4. What are the main limitations or gaps you have observed in the availability or use of these resources?

Objective (iii): To assess the suitability of the PE teaching environment for LwVI.

1. How would you describe the current PE teaching environment in terms of accessibility for LwVI?
2. What specific modifications have been made to the physical space to accommodate these learners?
3. What are the primary strengths and weaknesses of the teaching environment?

4. In your opinion, what improvements are necessary to enhance the PE teaching environment for LwVI?

END

THANK YOU FOR PARTICIPATION

Appendix III: Interview Guide for the LwVI

Dear participant,

My name is Nandutu Irene Eunice, a student of Masters in Special Needs Education of Kyambogo

University carrying out a study on “Teaching physical education to LwVI:

A case of a special secondary school in Soroti City, Eastern Uganda. You are identified as a potential

participant for this study. You are therefore requested to participate by responding to the following

questions. This study is purely for academic purposes only and the information obtained from you

will be treated with confidentiality.

Bio Data:

1. **Name:**
2. **Age:**
3. **Gender:**
4. **Grade/Class:**
5. **Duration of Visual Impairment:**

Interview Questions:

Objective (i): To establish the PE activities that LwVI engage in.

1. Can you describe some of the PE activities you participate in at school?
2. How do you feel about these activities? Are they enjoyable or challenging for you?
3. How do you think the activities could be improved to better suit your needs?
4. Are there any specific activities that you find particularly helpful or difficult?

Objective (ii): To examine the available educational resources used for teaching PE to LwVI.

1. What types of resources (e.g., special equipment, tools) are used during your PE lessons?
2. How do these resources help you during the activities?
3. Do you think there are enough resources available for you to participate fully in PE?
4. Are there any additional resources that you think would be helpful?

Objective (iii): To assess the suitability of the PE teaching environment for LwVI.

1. How easy is it for you to move around and participate in PE activities in your current environment?
2. Are there any specific features or modifications in the PE area that help you?
3. What challenges do you face with the current environment?
4. What changes would you suggest to make the PE environment more accessible for you?

END

THANK YOU FOR PARTICIPATION

Appendix iv: Letter to the School Administration

APPENDIX IV LETTER TO THE SCHOOL ADMINISTRATION



FACULTY OF SPECIAL NEEDS AND REHABILITATION

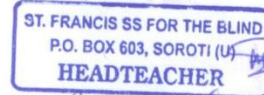
DEPARTMENT OF SPECIAL NEEDS STUDIES

4TH. JUNE.2024

The Head teacher,

St. Francis secondary school Madera, Soroti district.

Dear Sir/Madam,



Permission is granted to you to carry out your research

RE: REQUEST TO CARRY OUT DATA COLLECTION AT YOUR SCHOOL

I hereby submit my request to your office as per the above reference. I am a student of Kyambogo University pursuing a Masters degree in Special Needs Education. I am currently conducting a study on "Teaching physical education to learners with visual impairment", and the case of this study is your school which has been identified because it is one of the few schools that have embraced the teaching of learners with visual impairment.

The study is purely qualitative and intend to use interview, document analysis and observation. For that matter, I request your office to grant me permission to observe some one or two PE lessons and having access to some of the documents that I may request to analyse.

I will be grateful if my humble request meets your positive consideration. Attached are my introductory letter, admission letter and my university identity card.

Thank you

Yours sincerely

Nandutu

NANDUTU IRENE EUNICE

kvenjeirene@gmail.com/0774397773

Appendix V: An observation checklist

No.	Aspect to observe	Expected item	What is available	comment
1.	PE activity	PE lesson	Not observed	Teacher was no prepared
2.	PE resources	Adapted Balls	Some few	
		Nets	Only one seen	They had never used it.
		Play ground	seen	
		PE teachers	available	
		Sighted guides	Fellow learners	
		Ropes	Not there	
		Resource room	Use a library instead	PE equipment kept in the library.
		Schemes of work	Not available	Not seen
		Recorders	Only one for teacher	Not accessible to learners
		Ramps		

3.	Suitability of the PE environment	accessibility	somewhat	
		Physical space	minimal	Only to classrooms
		Leveled play ground	To some extend	Some potholes spotted
		Trained teachers	Not trained	
		Trained sighted guides	Not trained	
		Brailled equipment	non	
		tactile pathways	limited	

Appendix VI: Introductory letter to the participants of the study

APPENDIX V: LETTER TO THE PARTICIPANTS

KYAMBOGO



UNIVERSITY

FACULTY OF SPECIAL NEEDS AND REHABILITATION

DEPARTMENT OF SPECIAL NEEDS STUDIES

4TH. JUNE.2024

Dear participant,

RE: REQUEST TO PARTICIPATE IN A RESEARCH STUDY

I extend my request to you as per the above reference. I am a student of Kyambogo University pursuing a Master's degree in Special Needs Education. I am currently conducting a study on "Teaching physical education to learners with visual impairment", and your school has been identified for data collection. The purpose of this letter is therefore to request you to be one of my participants in this study. The information you will give will be strictly for academic purposes and therefore it will be kept confidential. This is a request and not a force. You can therefore withdraw if you feel uncomfortable participating in this study.

I will be grateful if you consider my request.

Yours sincerely


.....

NANDUTU IRENE EUNCE

kvenjeirene@gmail.com/0774397773

Appendix VII: Consent Form for the participants of the study

APPENDIX VI: CONSENT FORM



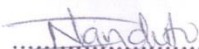
FACULTY OF SPECIAL NEEDS AND REHABILITATION
DEPARTMENT OF SPECIAL NEEDS STUDIES

Dear participant,

I am a student of Kyambogo University pursuing a Masters Degree in Special Needs Education. I am carrying out a study on "Teaching physical education to learners with visual impairment". This school has been identified as a case and you have been identified as a potential participant for this study. It is hoped that the findings will enlighten the educators on the teaching of physical education to learners with visual impairment. I am going to use an interview, document analysis and observation in this study. The information you will provide will be strictly for academic purposes and will therefore be confidential. However, you are free to withdraw from participating if you feel uncomfortable.

Thanks for your support and cooperation in advance.

Yours sincerely,


.....

NANDUTU IRENE EUNICE

kyenjeirene@gmail.com/0774397773

Confirmation of acceptance

I have read and understood the purpose of the study and I hereby consent to participate.

Signature.....

Date.....

Appendix VIII: Map of Uganda showing Soroti City



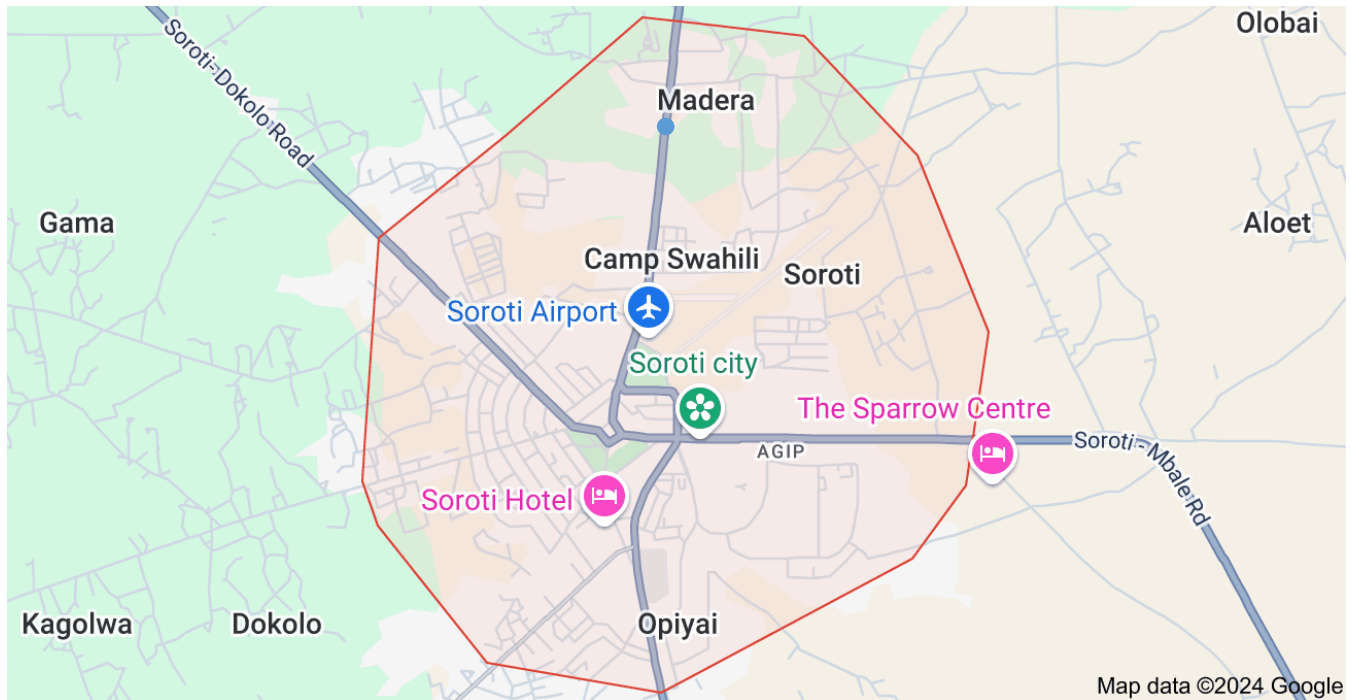
Source: Adapted from Uganda Bureau of statistics, 2017

KEY



Soroti city

Appendix 1X: Map of Soroti City showing area of study



Source: Adapted from Uganda Bureau of statistics, 2017

KEY

Area of study

